FAIRMODE 15th plenary meeting: Rome 02-03/03/2023

The meeting, hosted by ENEA (Italy), was organized as a hybrid event to allow remote attendance. About 140 participants (80 in presence, 60 from remote) attended. The meeting was organized in sessions, each dedicated to the FAIRMODE working groups (WG) that constitute the current work structure in FAIRMODE. This document summarizes the current status and next steps planned within each of the activities as proposed in the FAIRMODE 2023-2025 roadmap. All presentations are available on the FAIRMODE web pages and YouTube recordings are available at:

Day 1: https://youtube.com/live/jKXKfY_-F4c
Day 2: https://youtube.com/live/VcwOj8PwHvE

The meeting was introduced by M. G. Dirodi (Italian Ministry) and E. Vignati (EC-JRC). P. Thunis highlighted the particular focus of this meeting on the FAIRMODE roadmap 2023-2025 (circulated before the meeting to the participants) and the importance of this meeting given the recently published Ambient Air Quality Directive (AAQD) proposal.

Air Quality: revision of EU Rules

T. Henrichs (DG ENV) informed on the ongoing process of revision of the EU rules on air quality. The AQD proposal, published on 26 October 2022 sets new stricter AQ standards, based on an underlying impact assessment, with the view of maximizing health, social, environmental and economic benefits against mitigation costs. One of the important changes regards the assessment regimes and associated role of modelling which becomes mandatory when levels exceed limit/target values. He also mentioned the initiation of draft technical guidance documents, one of which on the use of modelling for various application domains for which support from FAIRMODE will be required in 2023/2024. These technical

guidance documents are necessary to ensure that AAQD requirements on modelling can be implemented in practice.

P. Thunis (DG JRC) then reviewed the FAIRMODE recommendations and highlighted how they had been considered in the AAQD proposal. M. Ross-Jones (Swedish EPA) finally provided the time plan for the discussions in Council under the Swedish presidency, with about 7 meetings planned by the end of June. He also mentioned the process steered by one Member State in the frame of AQUILA to collect feedback on this proposal.

Air Quality e-reporting

A. Gzella (EEA) informed on the current usage of air quality e-reported data at EEA, including processing to a common format, visualization, use in EEA assessments. Future plans include the creation of AQ maps supported by machine learning approaches.

Roadmap 2023-2025

P. Thunis (EC-JRC) presented the 2023-205 roadmap that keeps a structure close to the current one, with a view of adapting it to the AAQD proposal with time if relevant. The same nine working groups remain active within a two-pillars (assessment-planning) frame that aims at strengthening the connections among WGs. The new roadmap foresees a reinforcement of the benchmarking activities in some WGs as well as a new approach to structure guidance in line with the two-pillars frame.

WG1: Source apportionment (SA)

A. Clappier (U. Strasbourg) reviewed the status of the activities in the “source apportionment (SA)” activity. These consisted in (1) updating the SA guidance document, (2) supporting the e-reporting process and (3) supporting pilot regions in their SA assessments. G. Pirovano (RSE) informed on the status of CEN 264/44 which will resume in May with several experts expressing interest. The proposal for technical specifications would address the fitness for purpose of SA approaches, support to the interpretation of their results as well as an application protocol. The roadmap 2023-2025 includes the consolidation of the fitness for purpose SA guide (complementarity, extension to other pollutants…), the support to e-reporting, the further development of the SA protocol, and the interactions with CEN as priorities.

WG2: QAQC and fitness for purpose of assessment applications

P. Thunis (EC-JRC) reported on the status of the activities, in particular the publication of the benchmarking guidance document, the links between FAIRMODE and CEN and the current testing of the proposed QA/QC protocol which yet requires a wider phase of testing. Future activities will focus on the new phase of the composite mapping (MQI composite exercise, with an on-the-fly MQI calculation) which will be launched in Spring with a first analysis planned for the next technical meeting in the fall. This exercise will be coupled with a QA/QC of the (spatially aggregated) underlying emissions.

P. Thunis informed on the way the Modelling Quality Objectives have been considered in the AAQD proposal, in particular the links of the MQO to the limit/target values and measurement uncertainties as set in the current AAQD proposal.

F. Meleux (INERIS) presented the application of the CAMS metric performance indicators to the evaluation of the CAMS ensemble re-analyses.

WG3: Forecast

This WG aims at providing a specific benchmarking framework for modelled air quality forecasts. A. Piersanti (ENEA) reviewed the main achievement of the WG, i.e. the elaboration of a guidance document and the testing of the proposed indicators, mostly on national data so far. A paper summarizing the first findings will be submitted for peer-review in March. A. Monteiro highlighted the priorities for the coming 3-years period which will cover among others the development of a documentation support for expert to apply the forecast protocol, further testing of the indicators and the development of simpler diagrams for communication purposes. M. Gauss (Met.No) presented the application of the FAIRMODE MQI and associated assessment indicators to the evaluation of the CAMS regional forecasts.

WG4: Microscale assessment

Microscale air quality modelling refers to air quality modelling at high spatial resolution (typically order of meter scale), usually focused on urban environments. F. Martin (CIEMAT) reviewed the current state of activities which focus on the inter-comparison on the city of Antwerp and on the interpretation of the results in terms of supporting information for the AAQD. The Roadmap, presented by V. Rodrigues (Univ. Aveiro) foresees additional testing to assess the process of yearly aggregation as well as the development of an evaluation procedure. Increased connections with other WGs are also foreseen, in particular with WG8 (spatial representativeness), WG7 (emissions), WG2 (QA/QC assessment) and WG6 (validation) as well as with WG9 (Planning).

WG5: Air quality measures

The objective of this WG is to produce guidelines on air quality management practices, in particular to explain how to proceed from specific abatement measures, to evaluate consequent emissions and then concentrations. E. Pisoni (EC-JRC) reviewed the ongoing activities, in particular the finalization of the handbook that includes a collection of key challenges collected from local, regional or national authorities, as well as the work to improve the reporting of air quality measures. In the future, guidance should be developed to support practitioners in preparing air quality plans. This will be developed in the form of a checklist in collaboration with WG1 (source apportionment), WG7 (emissions), WG8 (exposure) and WG9 (Planning). He finally presented a proposal for an exercise to develop/assess this checklist in practice on 3 key measures.

WG6: Low-cost sensors and data-fusion

The main objectives of this activity are to explore and compare results from different approaches using/exploiting sensor networks. J. Wesseling (RIVM) informed on the status of the current activities that focused on sensor calibration and outlier detection using synthetic datasets as support. Future activities will focus on data fusion approaches, extending to other datasets than the current Dutch one, with a focus on city applications. Another priority will be to provide guidance and recommendations on the use of sensors both in terms of calibration, data-fusion or communication about related uncertainties.

E. Pisoni (EC-JRC) informed on the AQSENS project led by the JRC that published a guidance document on data-fusion on the basis of data collected in three cities (Antwerp, Zagreb and Oslo). A R-Shiny application is available to visualize/test different data fusion options on these datasets.

WG7: High resolution emissions

M. Guevara (BSC) first reviewed the status of the activities in the "high resolution emission" WG. The main achievements have been the elaboration of recommendations for metadata, the identification of best practices for the compilation of traffic and residential heating emissions, the initiation of benchmarking activities for the compilation of emissions from specific sectors. The roadmap, presented by S. Lopez-Aparicio (NILU) foresees an increase of the benchmarking activities with the launch of the second phase of the composite mapping exercise that will be based on spatially aggregated data. In complement to this activity, an emission dashboard will serve the purpose of assessing the consistency of the main EU wide inventories and of developing a reference against which bottom-up inventories can be compared to. The two exercises were discussed and welcome by participants among which several indicated their intention to participate.

WG8: Exc. indicators, spatial representativeness and network design

S.Janssen (VITO) reviewed the status of the various activities in this WG, in particular the remaining questions regarding the assessment of the spatial representativeness area of monitoring stations (threshold, station dependency…), and the need to fine tune the exceedance flagging indicator concept and provide associated guidance for its implementation. L. Tarrason (NILU) reported on the status of the inter-comparison exercise dedicated to the design of monitoring networks that involved 45 participants.

L. Tarrason (NILU) informed on the proposal to launch a common CAMS – FAIRMODE exercise to inter-compare approaches to deduct dust contributions whenever exceedances occur. A webinar is planned in March to set-up the exercise with those interested.

M. Ross Jones (Swedish EPA) informed on the strong links between the WG8 activities and the AAQD proposal. In the future, WG8 will need to (1) increase connections with AQUILA regarding spatial representativeness and monitoring design, (2) support the IPR review process as well as (3) support the drafting of technical guidance on the use of modelling lead by DG ENV. Future activities include the identification of best practices to estimate spatial representativeness, a feasibility exercise to report on

spatial representativeness and to follow-up on the monitoring design exercise (additional pollutants, different metrics…).

WG9: QAQC and fitness for purpose of planning applications

This WG is currently dedicated to the assessment of the robustness of air quality projections. In practice, this assessment consists in analyzing the sensitivity of the model responses to emission reductions scenarios, when input data (emissions, meteorology…) or the model itself are changed. B. Bessagnet (EC-JRC) presented the main achievements of this WG, with a particular focus on the first outcome of the inter-comparison exercise. Follow-up activities in the context of this exercise will concentrate on analyzing the role of specific factors (meteorology, resolution) as well as to engage with new teams to increase the number of available data per city. S. Janssen (VITO) informed on the connections between the WG9 activities and the AAQD proposal. He then presented the main challenges for this WG, among which the coupling of spatial scales in AQ plans (in terms of models and policies), the assessment of future absolute concentrations, the evaluation of individual measures as requested in the AAQD proposal, the assessment of policy impacts in neighboring countries, the evaluation of the natural background or the consequences for e-reporting of planning data.

A. Colette (INERIS) presented CAMS policy products applications related to planning, in particular the act tool and related initiatives to assess the quality of the results.