WG2 - QA/QC for assessment

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Plenary meeting in Prague, 5th March 2025

WG2 activities since last plenary meeting

MQI composite mapping exercise

- Kick-off webinar -concept and timeline - 18th April 2024
- First interpretation webinar - 3rd June 2024
- Second interpretation webinar - 3rd September 2024
- Third interactive discussion – 8th October 2024 – Technical meeting Dublin

20 groups participating with shared experiences from BE, DE, IT, PL, NO, SE

WG2 MQI composite mapping exercise

Questions addressed

- **Q1 – Is the MQI robust?**
- **Q2 - Are the MQI stringent enough and consistent among pollutants?**
- **Q3 – Does the fail/pass MQO test ensure a valid distinction between Fit/non-Fit-for-purpose modelling applications ?**
- Q4 – How to proceed when models use data-fusion & data assimilation?

2024 focus first on Q1+Q2+Q3

Q1 - WG2 composite mapping exercise

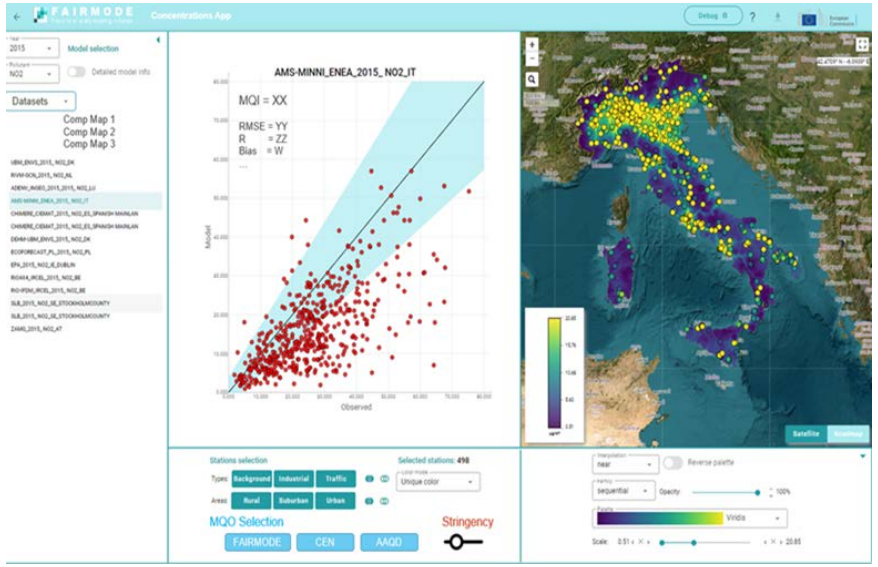
In this initial stage – the purpose of the exercise was also to build trust on the FAIRMODE MQI platform

- ✓ Comparing FAIRMODEs on-the-fly MQI with own home calculation

Q1 Is the MQI robust?

- ✓ Test the robustness of the MQI with respect to
  - the aggregation area (polygons vs. country)
  - the number of stations
  - across the different pollutants

✓ Positive feedback from participants FAIRMODEs on-the-fly MQI useful for benchmarking activities



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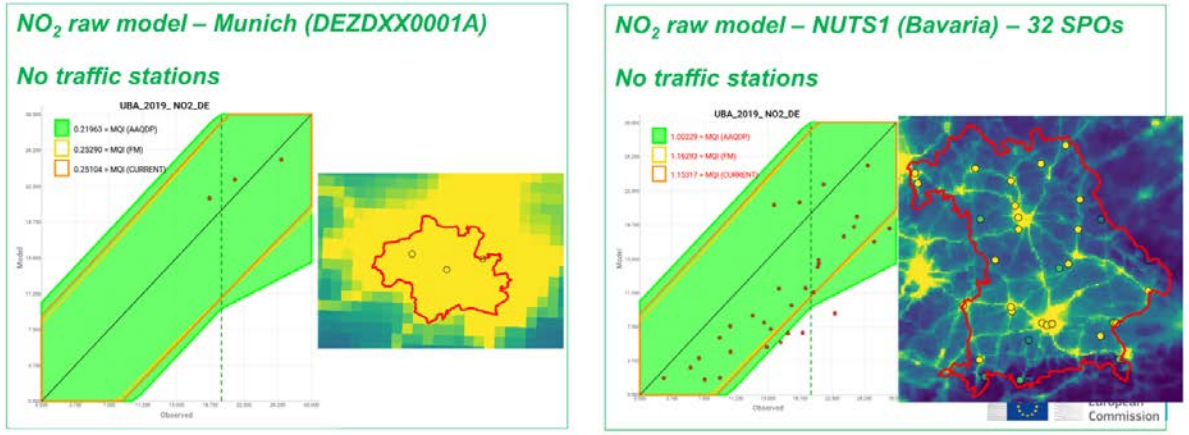
Q1 - Robustness of the MQI

- **Focus on minimum number of stations (SPOs)** Few SPO available for evaluation of MQI is a common situation

✓ **The MQO easier to fulfill with few stations, appears to stabilize at around 10 SPO when larger areas are considered**

WG2 MQI robustness – Germany

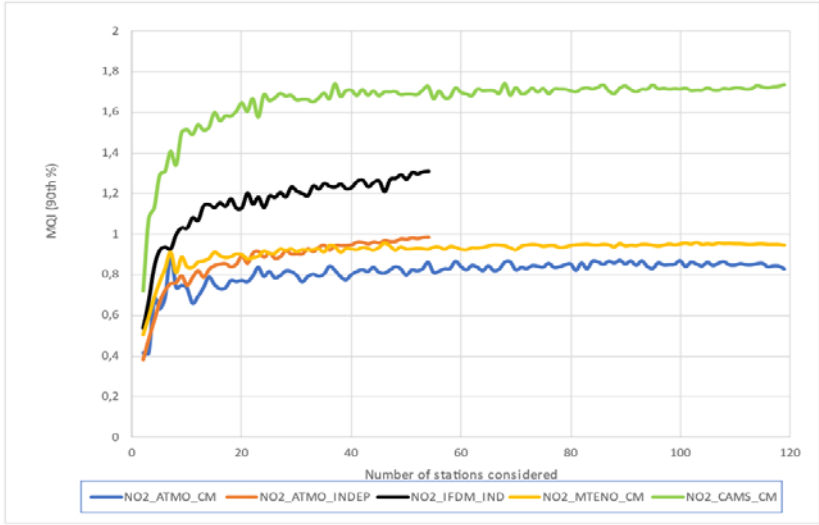
Robustness test I – MQI with respect to aggregation area (zone level vs. NUTS1)



WG2: Evaluation in Belgium

MQI for different stations and models

- stations Composite Mapper and Independent
- ATMO-Street, IFDM, METNO and CAMS

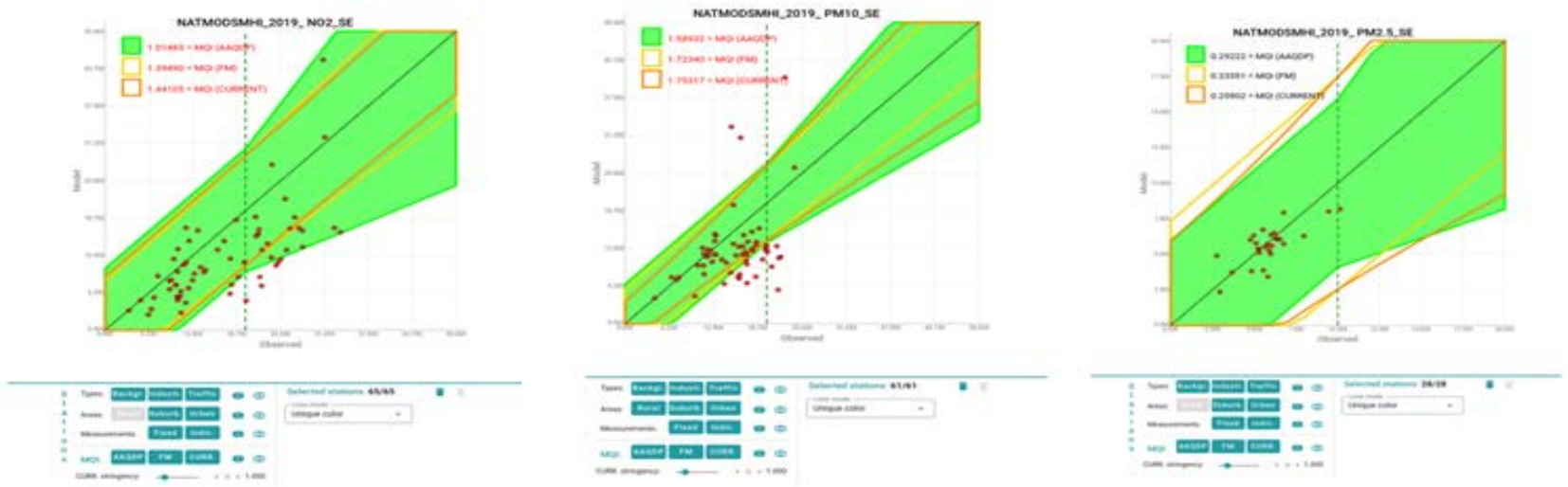


Q2 - Robustness of the MQI - Are the MQI stringent enough and consistent among pollutants?

- ✓ **The yearly MQO for $PM_{2.5}$ is in general too easy to fulfill**
- ✓ MQI not stringent enough for $PM_{2.5}$ as it is formulated at the moment

WG2 Evaluation of MQI robustness - Sweden

Robustness test I – when including traffic stations the MQO fails for NO2 and PM10, but not for PM2.5



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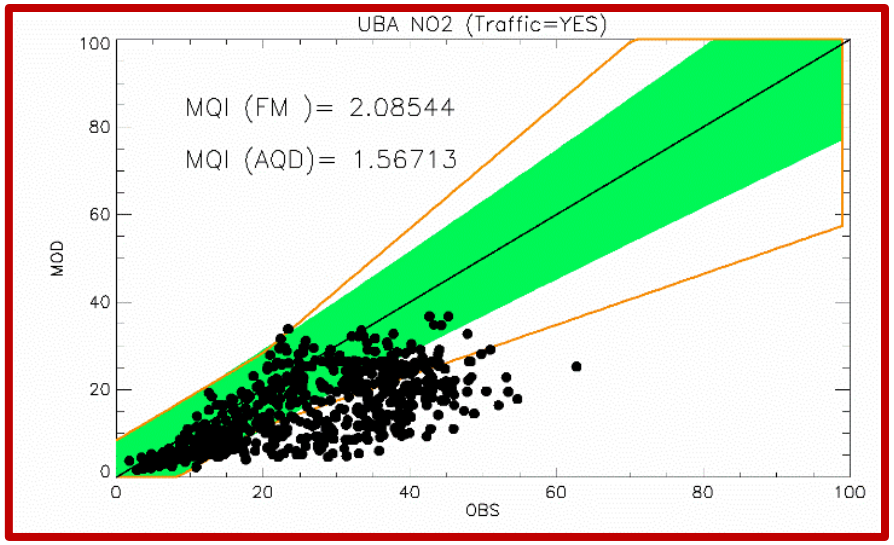
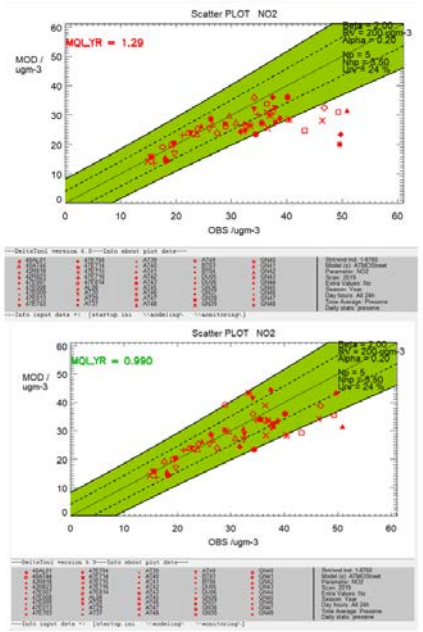
Q3 - Does the fail/pass MQI test ensure a valid distinction between Fit vs non-Fit-for-purpose modelling applications ?

- ✓ For NO2, we would expect the MQO to fail on traffic stations when large resolution modeling is used. Results indicate that this is the case…
- ✓ Further look on NO_2 and Ozone (peak season?)

WG2: Evaluation in Belgium





MQI 2019 without street canyon effects

MQI 2019 with street canyon effects (OSPM – model included)

FAIRMODE MQO valid distinction between fit/non fit for purpose for NO2

Next steps – planned work in 2025

1. **Additional tests on the stringency of the MQO**

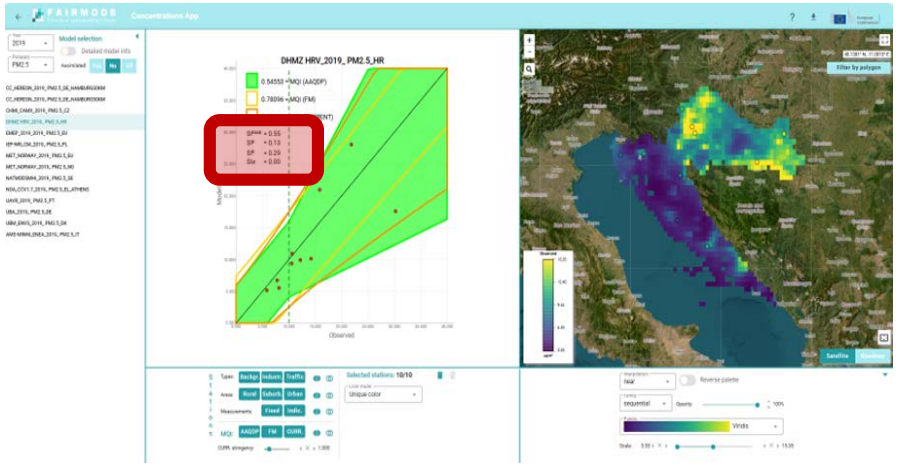
The yearly MQO for PM2.5 is in general to easy to fulfill. A possible solution is to adapt the value of the stringency parameter (β)

- Propose a value of the stringency parameter (β), for instance by allowing 90th percentile of the models to fulfill for PM2.5

2. **Additional tests on the minimum number of SPOs**

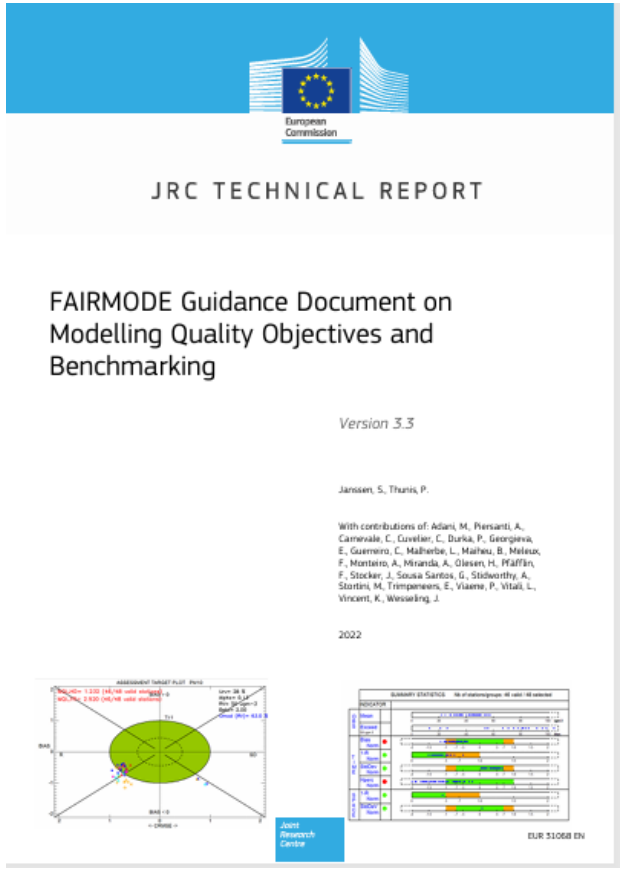
The 2024 analysis suggest 10 as a minimum number of stations to run the MQI. Enlarging the modelling domain to include more stations can lead to different results.

- Enlarge the MQI domain to include enough stations, opening for boundary conditions
- Investigate the use of different years data to be used as additional SPOs
- Investigate the use of additional temporal indicators to solve the problem with few stations and stringency issues?



Additional temporal indicators already in the platform

Next steps – planned work in 2025



Benchmarking guidance

Need to **update** the current version (2022) to:

- align with the AAQD 2024 and associated technical support document
- consider the latest development in the context of CEN WG43
- Update the recommendations related to forecast

Proposed **timing**

- Draft updated benchmarking guidance: Aug 25
- Comments & feedbacks: Sep 25
- Discussion at technical meeting: Oct 25
- Publication: Dec 25

Contribution from WG2 to better modelling for assessment

- The WG2 work with the definition of MQI has provided a sound basis for a harmonised formulation of the MQI in the revised AAQD
- Confidence in the modelling systems used under the AAQD needs to be assessed and reported. The work in WG2 contributes to **increased harmonization** of the best practices to calculate the MQIs
- WG2 contributes to improved understanding of the limitations and caveats in the MQI calculations.
- Questions from WG2 on the robustness of the MQIs have been communicated and included in the work to be carried out in 2025 by CEN WG264/43 on MQO
    - How do we organize the work in 2025 to avoid duplication of work with CEN?

Thank-you

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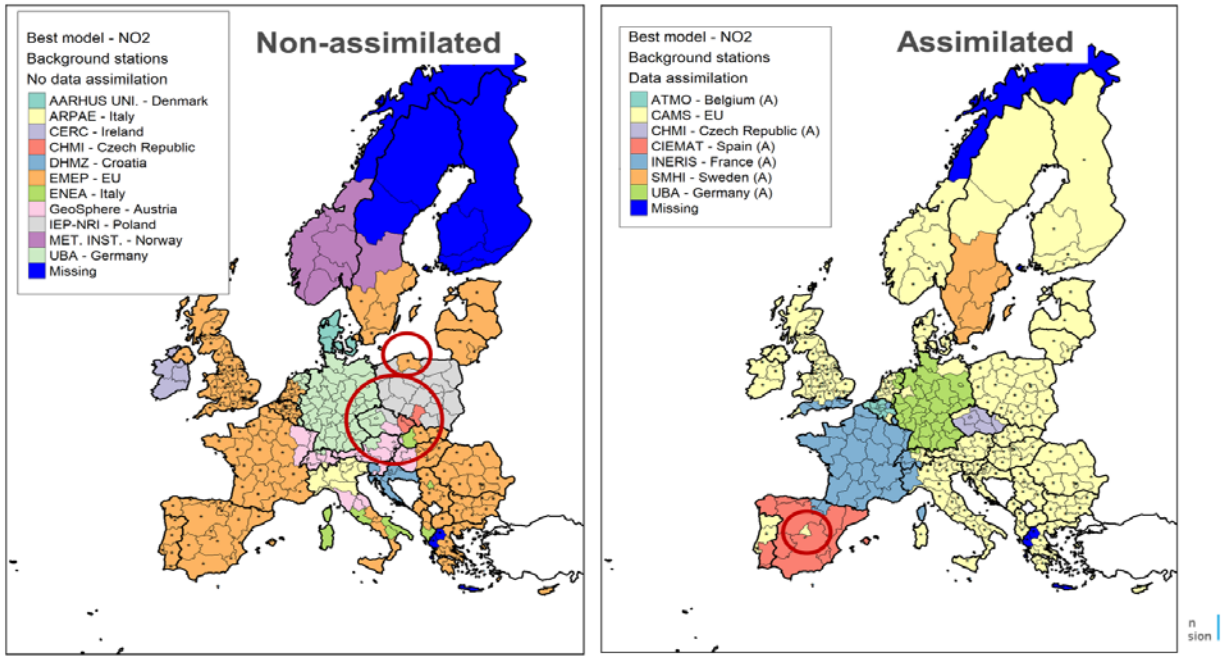
Q4 - How to proceed when models use data-fusion & data assimilation?

- Information on stations used for assimilation is needed
- Can we apply the “leave one out” approach?
- How to deal with the fact that different models used different station datasets for assimilation/validation?
- Should there be a different stringency criteria for data assimilation model in the platform?



WG2 first interpretation webinar 3.06.24

- Agenda for the first interpretation workshop of the WG2 - MQI mapping exercise.

1. Updates from the MQI composite mapping tool
2. First experiences from Germany on the use of the MQI mapping tool
3. Tour de table on state of contributions
4. Next meeting 3. September 2024 (10:00 – 12:00)
5. AOB

WG2 second interpretation webinar 3.09.24

- 10:00 - 10:05 Welcome and purpose of the second interpretation meeting
- 10:05 - 10:20 **Poland:** experience and test with the MQI (Pawel)
- 10:20 - 10:35 **Norway:** experience and tests with the MQI (Bruce)
- 10:35 - 10:50 **Belgium:** experience and tests with the MQI (Peter and Elke)
- 10:50 - 11:00 Main conclusions so far
- 11:00 – 11:05 Comfort break
- 11:05 - 11:15 Latest update from JRC on the MQI tool
- 11:15 – 11:30 Short updates “on-going work” Germany (Stefan), Italy (Francesca) and Sweden (Ma
- 11:30 – 11:45 Organization of the WG2 meeting in Dublin – Feedback in the MQI part of the modelli guidance document (Leonor and Philippe)
- 11:45 – 12:00 AOB

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WG2 Agenda - Tuesday 8th October – 11:00-13:00

QA/QC of assessment applications – Benchmarking

- 11:00 – 11:10 Welcome and summary of benchmarking exercises in 2024: Discussion issues (Leonor)
- 11:10 – 11:30 Benchmarking exercises – **Focus on Stringency for PM2.5**
  - Experiences from Norway (Bruce) and Belgium (Peter)
- 11:30 – 11:40 Benchmarking exercises – **Focus on minimum number of stations**
  - Experiences from Germany (Stefan) and Sweden (Maria)
- 11:40 – 11:45 Benchmarking exercises – **Focus on complementary indicators** (Alexander)
- 11:45 – 11:50 Introduction to the group discussions (Philippe)
- 11:50 – 12:30 **Group discussions (4 groups 2+2 discussion** on (a) stringency and (b) nb stations)
- 12:30 – 12:50 Summary from the discussion - 4 groups (% min per group)
- 12:50 – 13:00 Way forward (Philippe)

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