

WG5: AQ management & planning

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FAIRMODE Plenary Meeting – Prague – March 5 - 6, 2025



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Outline

- Context: challenges in modelling for AQ planning
- Integration of local AQ Plans in EU/national/regional AQ Plans
- Bias projection: benchmark exercise and first results
- Next steps

Context: challenges in modelling for AQ planning

Items identified in the TM Athens, 2023

- Do you **calibrate** the base case of your air quality plan with measurements? If so, how do you deal with this calibration in the scenario runs?
- Do you **integrate** a local air quality plan in a national plan? Do you take into account air quality plans in neighboring regions or Member States? How is the integration performed?
- Do you assess whether **compliance** is achieved after implementation of the air quality plan? How do you evaluate the remaining hot spot locations?
- What is the **time horizon** of the model simulation? How do you evaluate whether compliance is reached “as soon as possible” as requested by the AAQD?
- How do you deal with **meteorological** variation in the scenario runs for air quality planning?
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- Do you evaluate the air quality plan at **concentration** levels or do you take into account **health impacts** as well?

Context: challenges in modelling for AQ planning

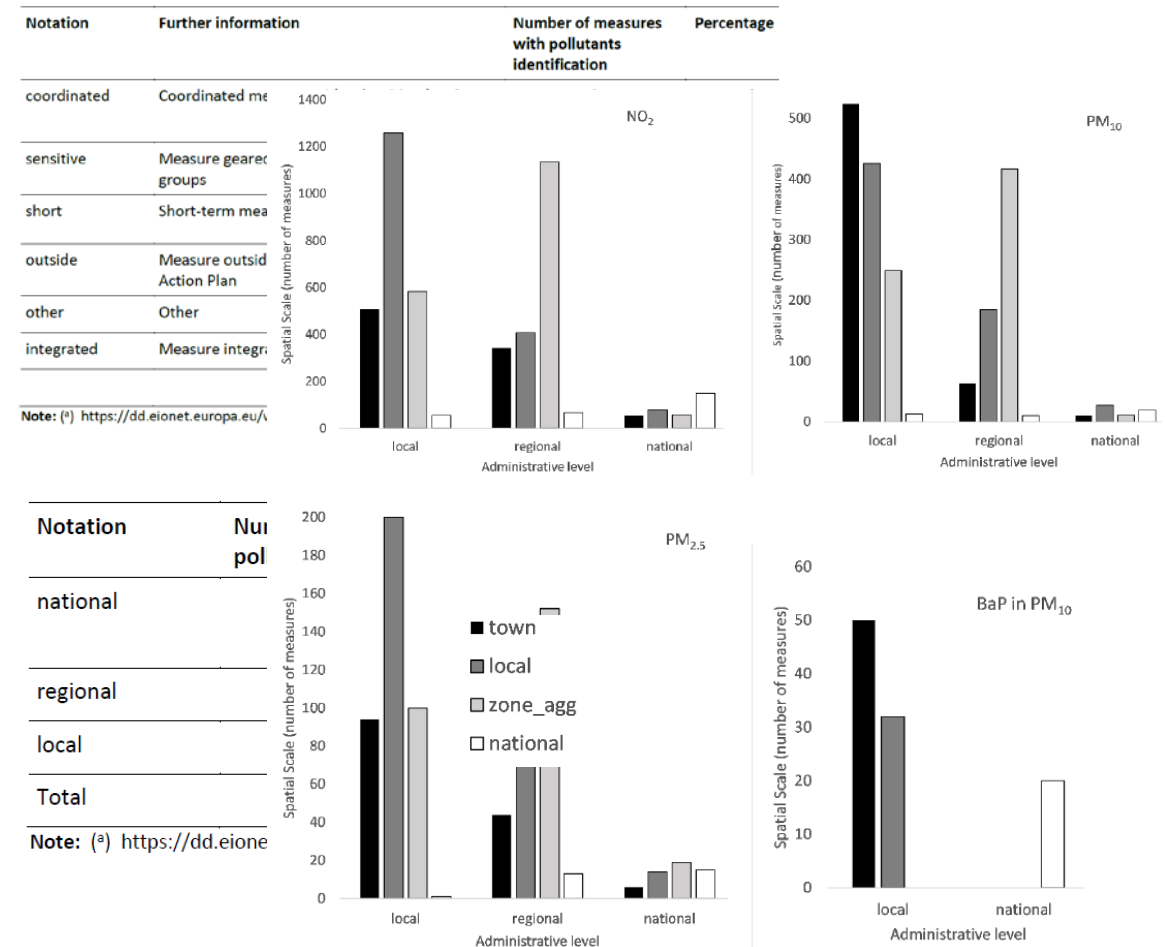
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Integration of local AQ Plans in EU/national/regional AQ Plans

AQ plans integration at multi-level governance

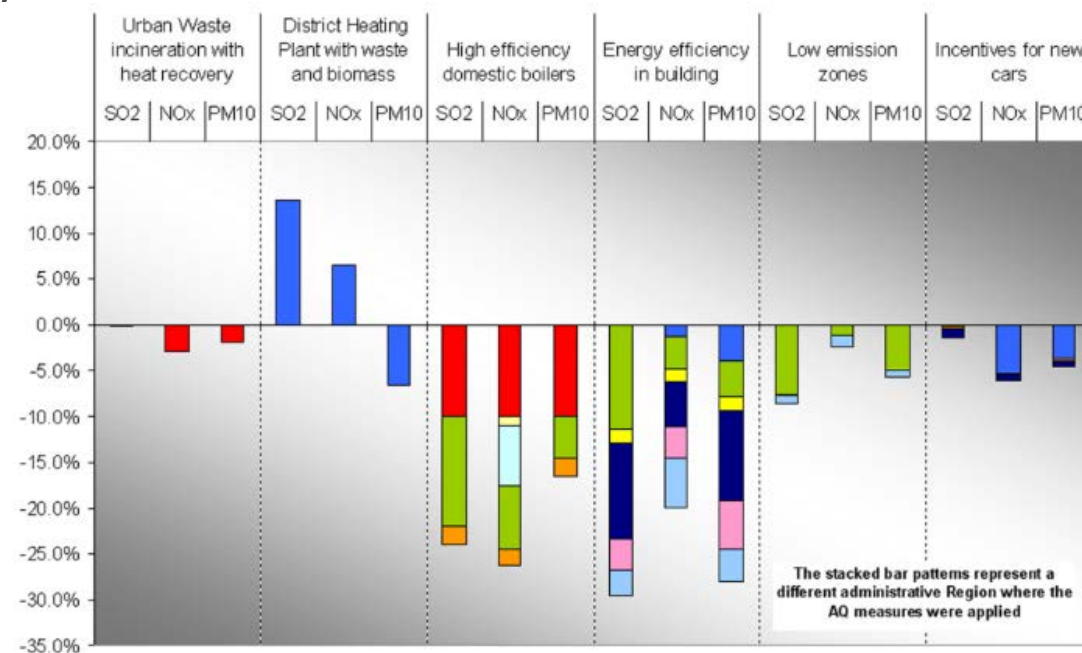
- Presented information on AQ plans (H-K) reported between 2014 and 2020 relating to exceedances (G) - [ETC/ATNI Report 9/2020](#)
- Over 50% of the measures are applied at local level, with less than 10% applied at national level
- Most of the measures (~90%) are applied for the particular AQ plan and not integrated with other national plans



AQ plans integration at multi-level governance

Country experiences (IT, PL, SE)

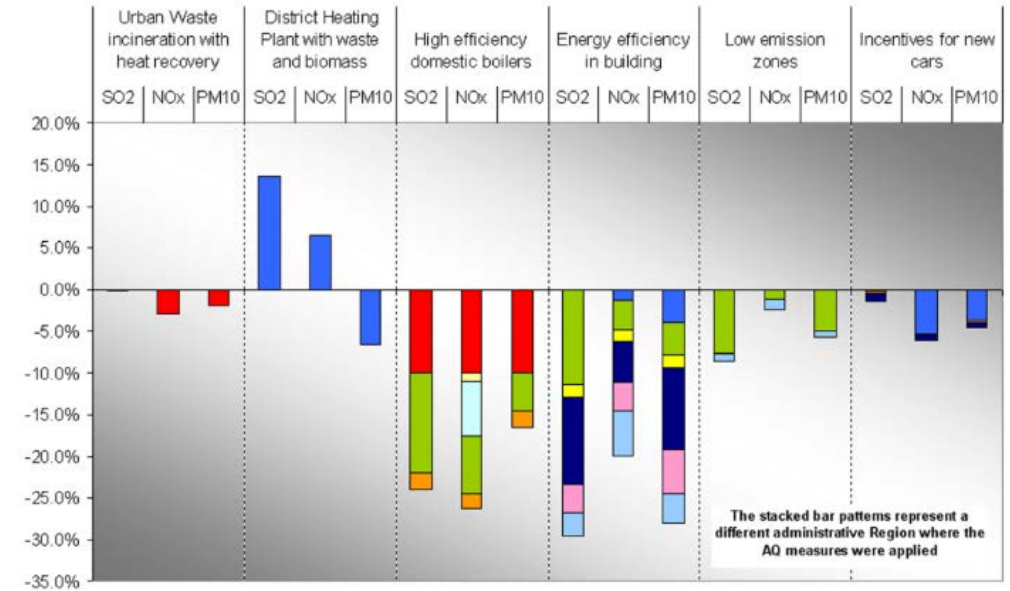
- Air Quality Management and Reporting is, for many countries, done at regional level while emission scenarios are done at national level
- Different approaches may be used to assess the efficiency of measures at regional level → what is considered when modelling (spatial extent, other plans, etc)
- No formal mechanisms to integrate or coordinate measures between national and regional level; little to none cross-borders cooperation
- Acquisition of emission data after measures or, at least real reductions from surrounding regions and countries



AQ plans integration at multi-level governance

Country experiences (IT, PL, SE)

- Model responses are robust for policy support, for short/long-term plans, but still not fully trusted/implemented
- Integration of policies (on energy, air pollution and climate) is necessary to tackle possible negative effects on air quality and climate change

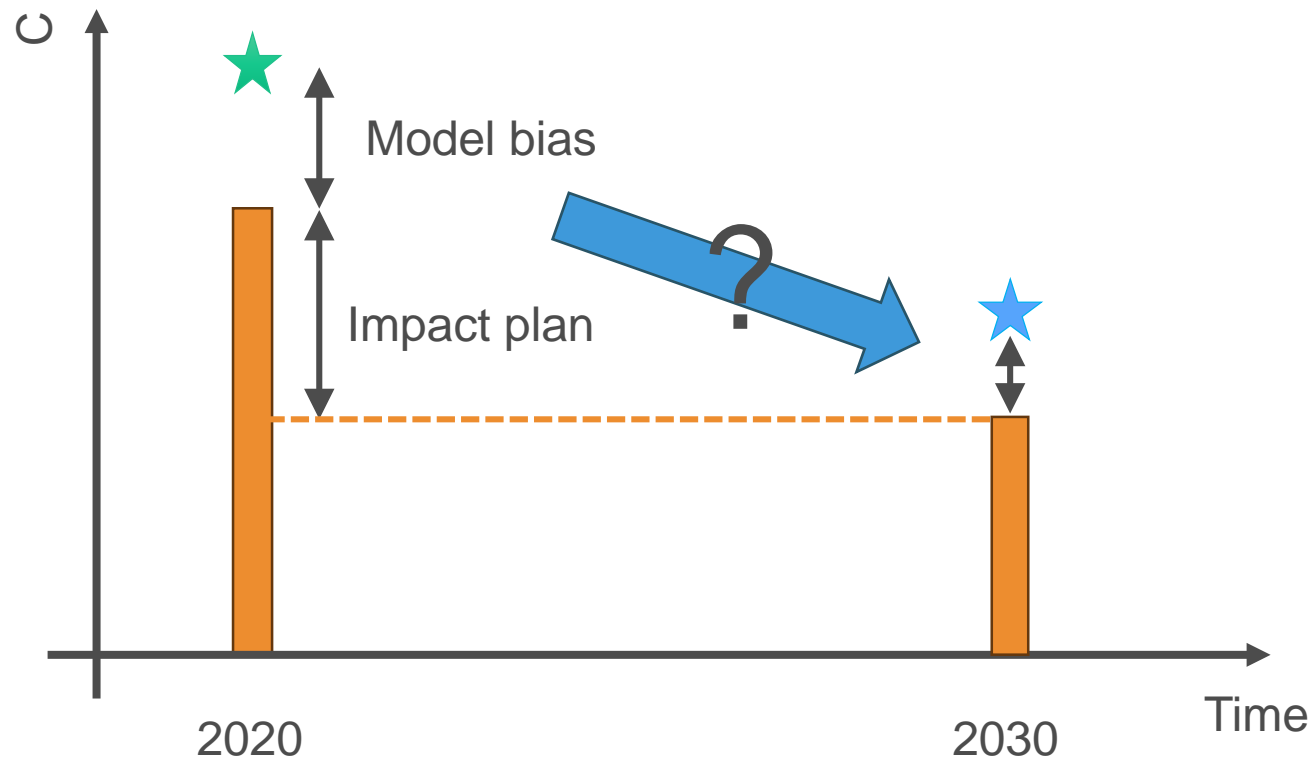


Bias projections

Bias projection

Additional issues:

- How to define the bias?
- How to extrapolate it in space?



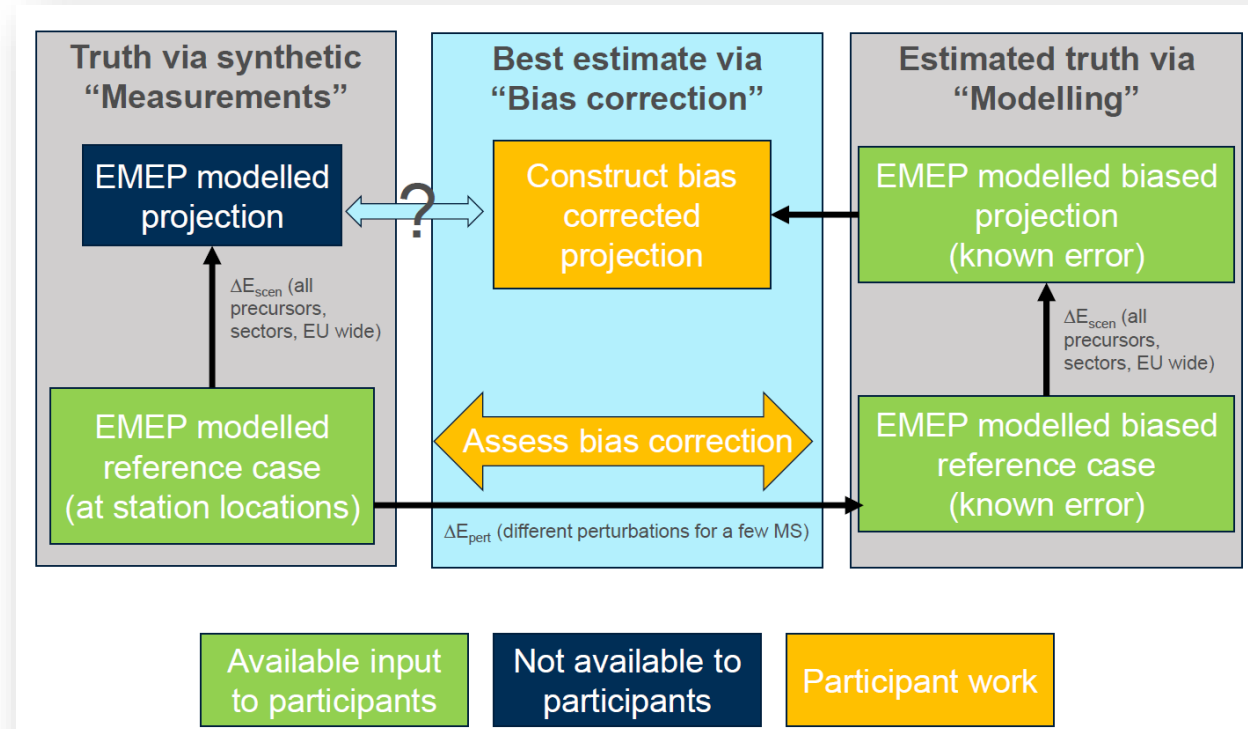
- ★ Observation
- ◆ Model
- ★ Best estimate future concentration

Questions addressed during the 2024 Technical Meeting

- Q1: Is a bias correction needed in future projections?
 - Yes!
 - But don't use it when a model is really biased and not fit-for-purpose.
- Q2: Are there recommendations for a relative or absolute bias?
 - Not clear yet.
 - But understanding where bias is coming from is important to make any selection.
- Q2bis: Do we need a source apportionment to refine the bias correction? Is this realistic in practices?
 - Discrimination between local/background or natural/anthropogenic might be relevant.
 - However, a full SA analysis might not be realistic in practice.
- Q3: What can be recommended for the extrapolation of the bias at station locations towards a full map?
 - No clear recommendations yet.
 - Be careful not to extrapolate a large bias in e.g. a traffic station to rural areas.
 - Link with WG6?
- Q4: What would be a good benchmark strategy to validate the bias projection approach?
 - Dynamic evaluation based on historic data set will be labor intensive
 - Work with a synthetic data set to benchmark bias projection and interpolation algorithms.

Benchmark exercise with synthetic data

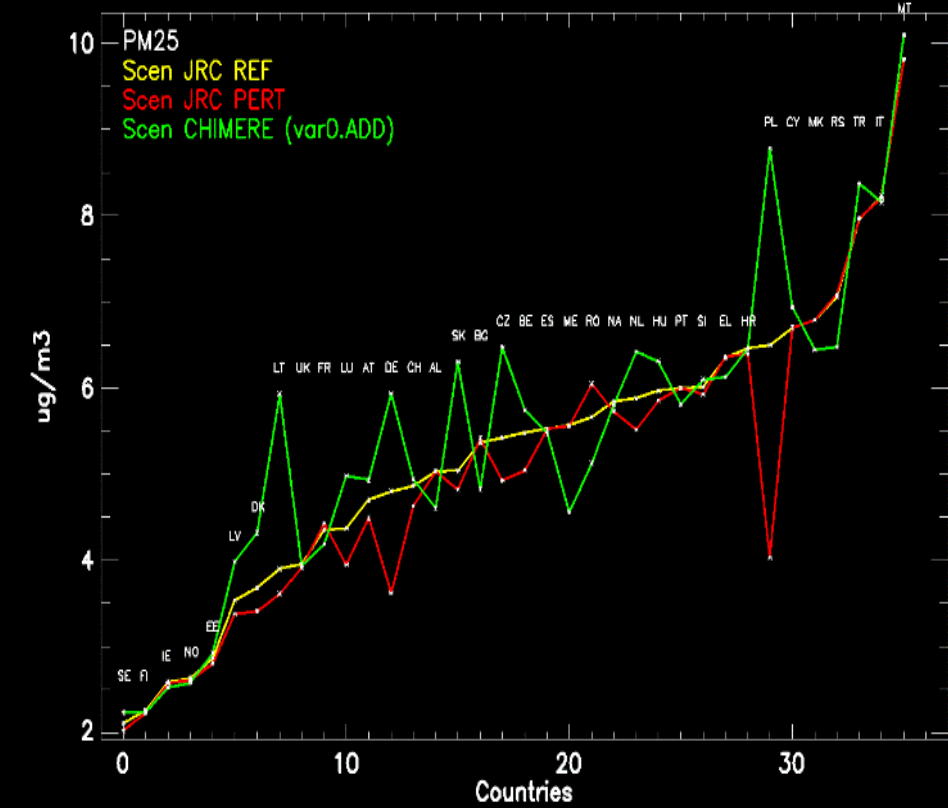
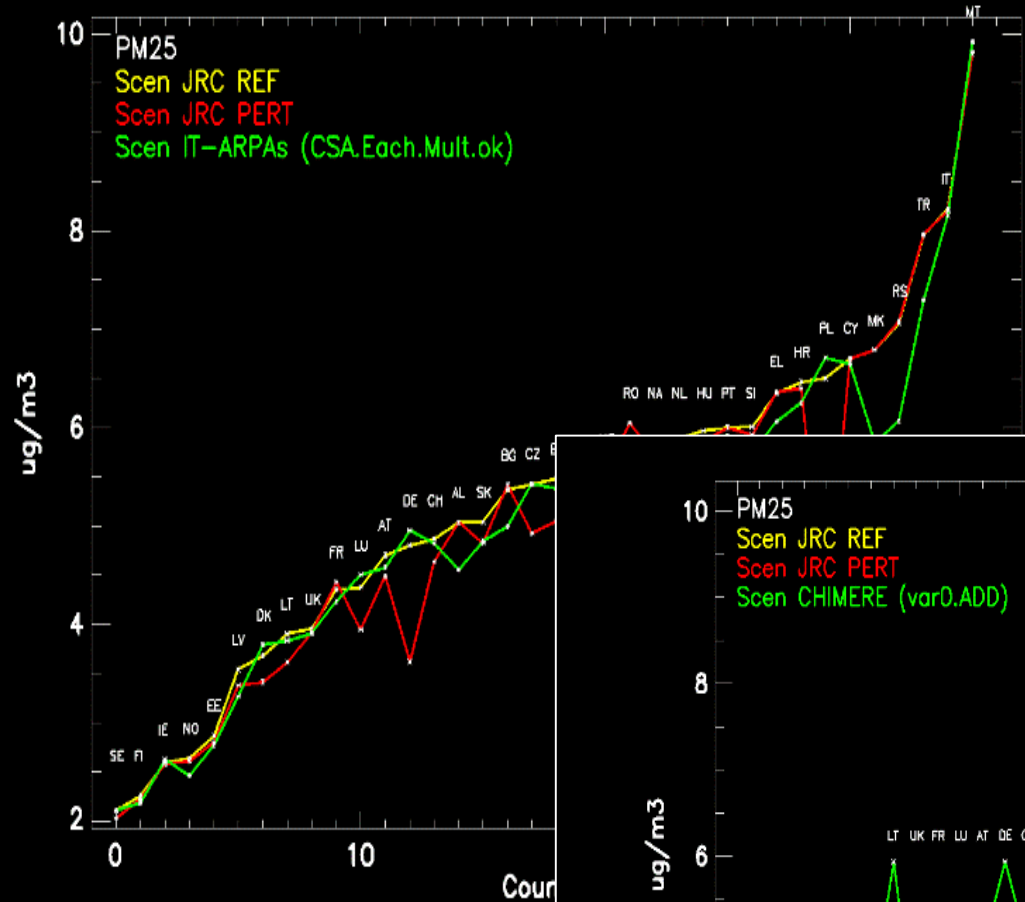
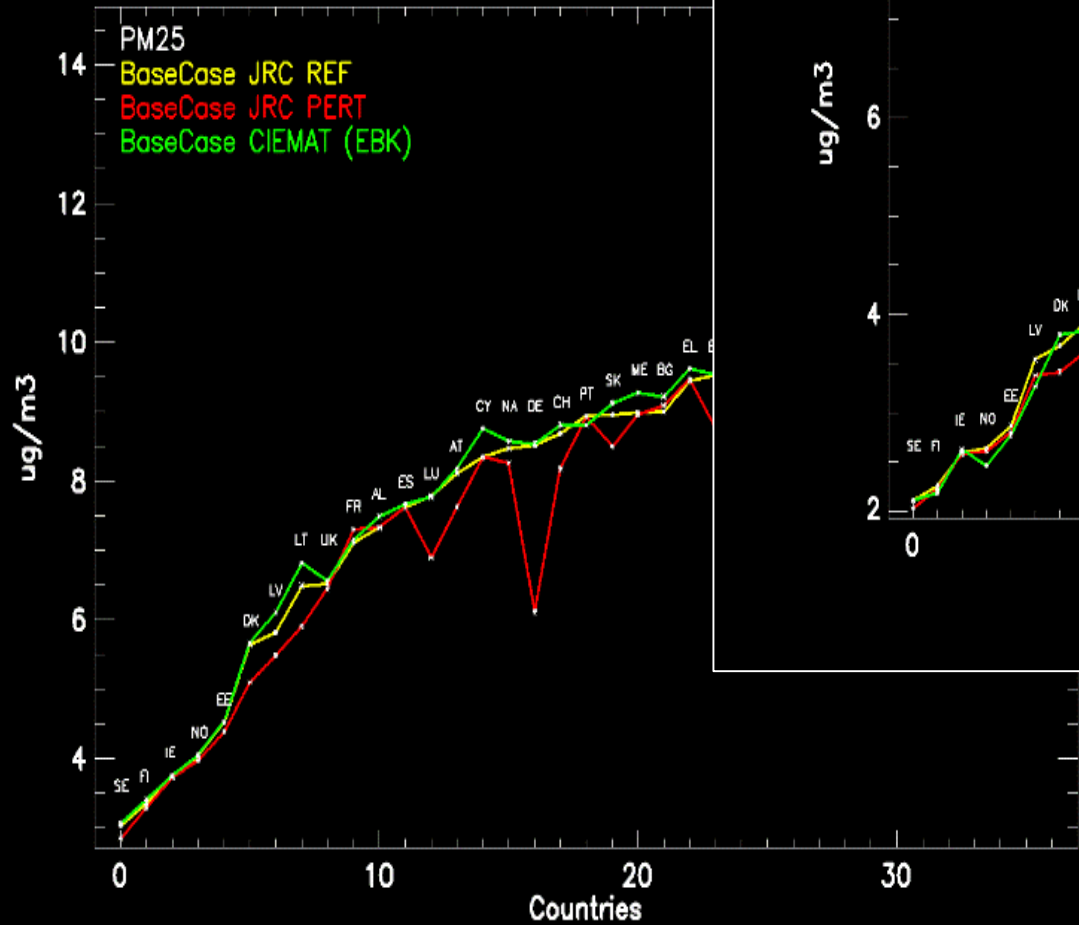
- EMEP simulations for a REF and SCEN as “synthetic “truth”
- Synthetic truth for REF extracted at stations locations
- Perturbated EMEP simulations REF and SCEN as model equivalent
- Benchmark: Reconstruct truth for REF and SCEN via preferred bias correction/projection method



Expression of Interest (so far...)

Country	Institute	Name	Data processing
CZ	CHMU	Ondřej Vlček	√
DE	NRW	Felicitas Garau	√
DE	IVU	Florian Pfäfflin, Lina Neunhäuserer, Volker Diegmann	
ES	CIEMAT	Mark Theobald, Marta Garcia Vivanco	√
FR	INERIS	Elsa Real, Augustin Colette	√
GR	NKUA	Elissavet Bossioli	√
IT	ENEA, ISPRA, ARPA's	Giovanni Bonafè, Loris Colombo, Chiara Collaveri, Francesca Guarnieri, Stefano Bande, Roberta Amorati, Alberto Dalla Fontana, Alessandra Gaeta, Barbara Intini, Gianluca Leone, Tiziana Magri, Elisa Malloci, Maria Antonietta Reatini, Lina Vitali, Mihaela Mircea.	√
IT	RSE	Elena De Angelis	
IT	SUEZ	Alessandro D'Ausilio	
NL	RIVM	Koen Siteur, Ronald Hoogerbrugge	√
NO	MetNo	Bruce Rolstad Denby	?
NO	NILU	Gabriela Sousa Santos, Sam-Erik Walker	√
PL	IOS	Durka Paweł, Norowski Aleksander	√
UK	Uni of Hertfordshire	Ranjeet Sokhi	?

First results



WG5 - Next steps

- Continue the bias projection exercise
- Identify other challenges in AQ Planning

Remaining challenges in modelling for AQ planning

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