# WG5:
# AQ management & planning

Joana Soares & Stijn Janssen

FAIRMODE Technical Meeting – Dublin –October 7 - 9, 2024

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# WG5 agenda Technical Meeting

| Day | Time | Topic |
|---|---|---|
| October 8 | 9:00 – 10:30 | Bias projections |
| October 8 | 16:30 – 18:00 | Open issues in the Guidance Document |
| October 9 | 9:00 – 10:30 | Integration of local and national AQ plans |

# Bias projections

# Agenda

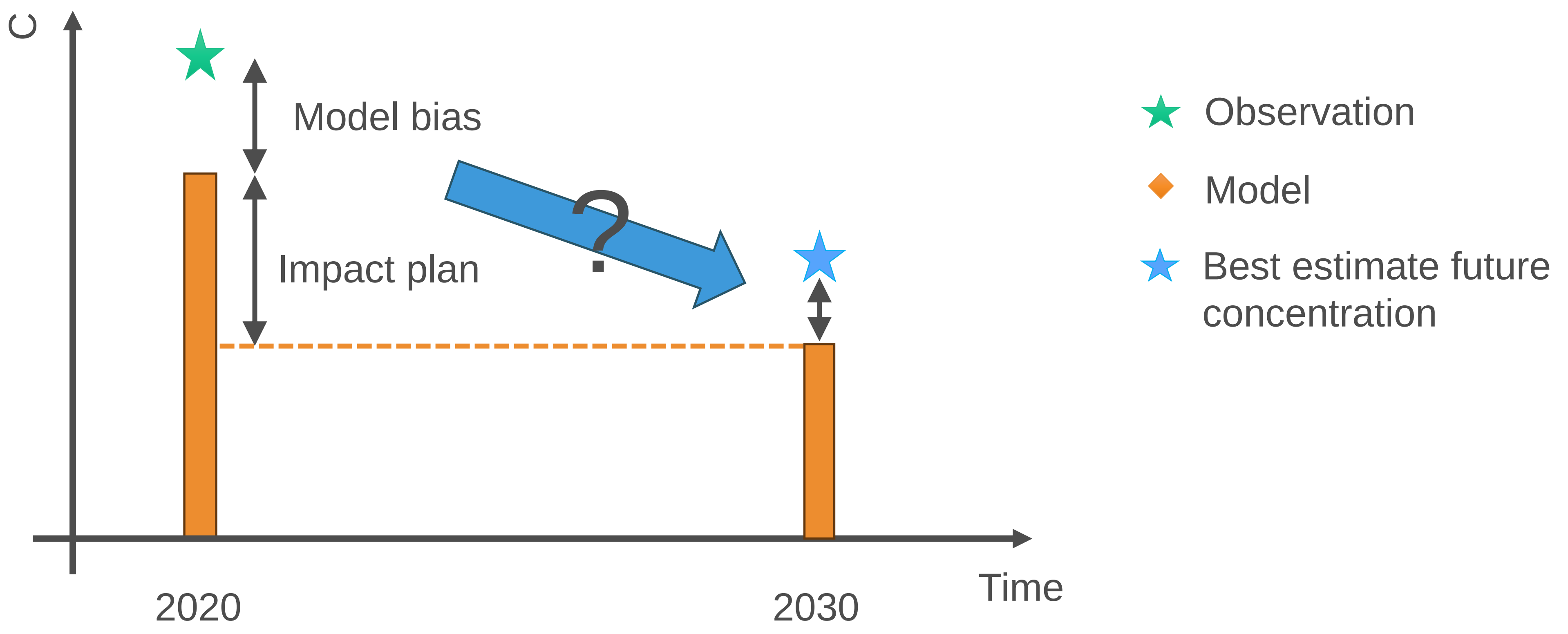
- Short introduction to the subject (Stijn - 5’)
- Recap of a workshop (May 27, 2024) on current practices (Stijn - 15’)
- Guidance Document and related feedback (Bruce – ’10)
- Group discussion towards *“Best practices & recommendations”* (all – 30’)
- Plenary feedback group discussion (25’)
- Next steps & wrap up… (15’)

# Introduction to the subjetc

# Bias projection

Additional issues:

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



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# Why is this relevant?

AAQD request for an assessment of absolute concentration levels in the future that can be benchmarked with limit or target value

CHAPTER IV

PLANS

Article 19

Air quality plans ***and air quality roadmaps***

1. Where, in given zones, the levels of pollutants in ambient air exceed any limit value ***or target value*** laid down in Section 1 of Annex I, Member States shall establish air quality plans for those zones ***that set out appropriate measures to achieve the limit value or target value concerned and to keep the exceedance period as short as possible, and in***

# Outcome of workshop on current practices

# Online workshop (May 27, 2024)

| Topic | Speaker |
| --- | --- |
| Introduction | Stijn Janssen (VITO) |
| Italian reflections | Antonio Piersanti / Mihaela Mircea (ENEA) |
| Norwegian reflections | Bruce Denby (MetNo) |
| French reflections | Elsa Real (INERIS) |
| German reflections | Florian Pfäfflin (IVU) |
| Belgian reflections | Hans Hooyberghs (VITO) |
| Spanish reflections | Mark Theobald (CIEMAT) |
| Discussion and next steps | All |
| End of meeting | |

# Italian approach

ENEA
ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT

arpae
agenzia prevenzione ambiente energia emilia-romagna

Absolute: $B_A = M_{ref} - O$

Relative: $B_R = (M_{ref} - O)/O$

Fraction: $B_F = O/M_{ref}$

## $B_A$ vs $B_F$

| WM | | $B_A$ number of non-compliant and compliant zones - $B_A$ | | | $B_F$ number of non-compliant and compliant zones - $B_F$ | | |
|---|---|---|---|---|---|---|---|
| | | 2010 | 2020 | 2030 | 2010 | 2020 | 2030 |
| $NO_2$ | year | 38 | 34 | 25 | 38 | 21 | 3 |
| $NO_2$ | hour | 3 | 3 | 3 | 3 | 2 | 0 |
| PM10 | year | 13 | 8 | 5 | 13 | 1 | 0 |
| PM10 | day | 38 | 38 | 37 | 38 | 28 | 19 |
| PM2.5 | year | 9 | 4 | 1 | 9 | 1 | 0 |
| $O_3$ | Daily max of 8h avgs | 46 | 39 | 29 | 46 | 34 | 28 |

# ARPAE: model adjustment BF

*$f_i = O_i / M_i$*

*$O_i$ observation; $M_i$ model value for each station location i*

*Kriging with external drift* KED

*fk,j correction matrix over model grid: cell (k, j )*

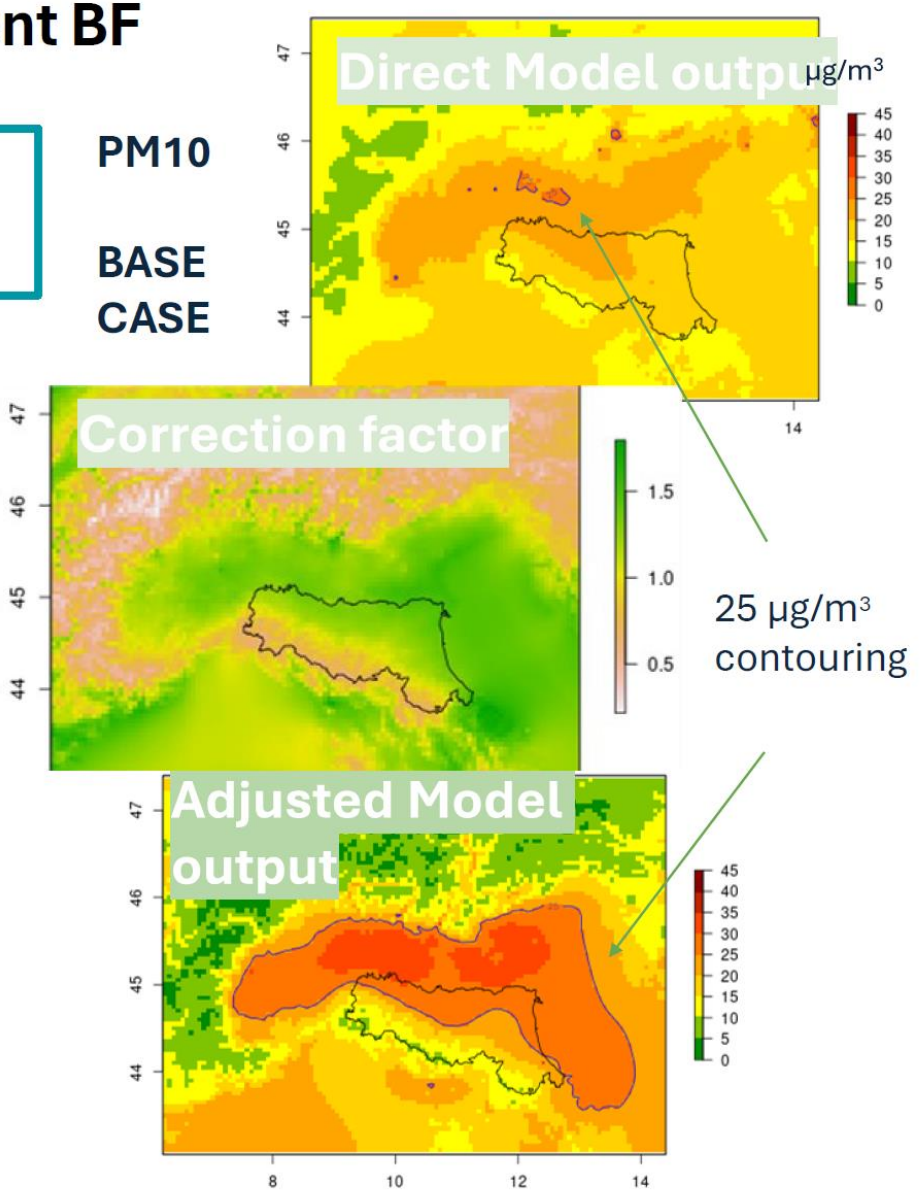
$M^{BASE}_{j,k}$: direct model output base case

$M^{*\,BASE}_{j,k} = M^{BASE}_{j,k} x\, f_{j,k}$: adjusted model base case

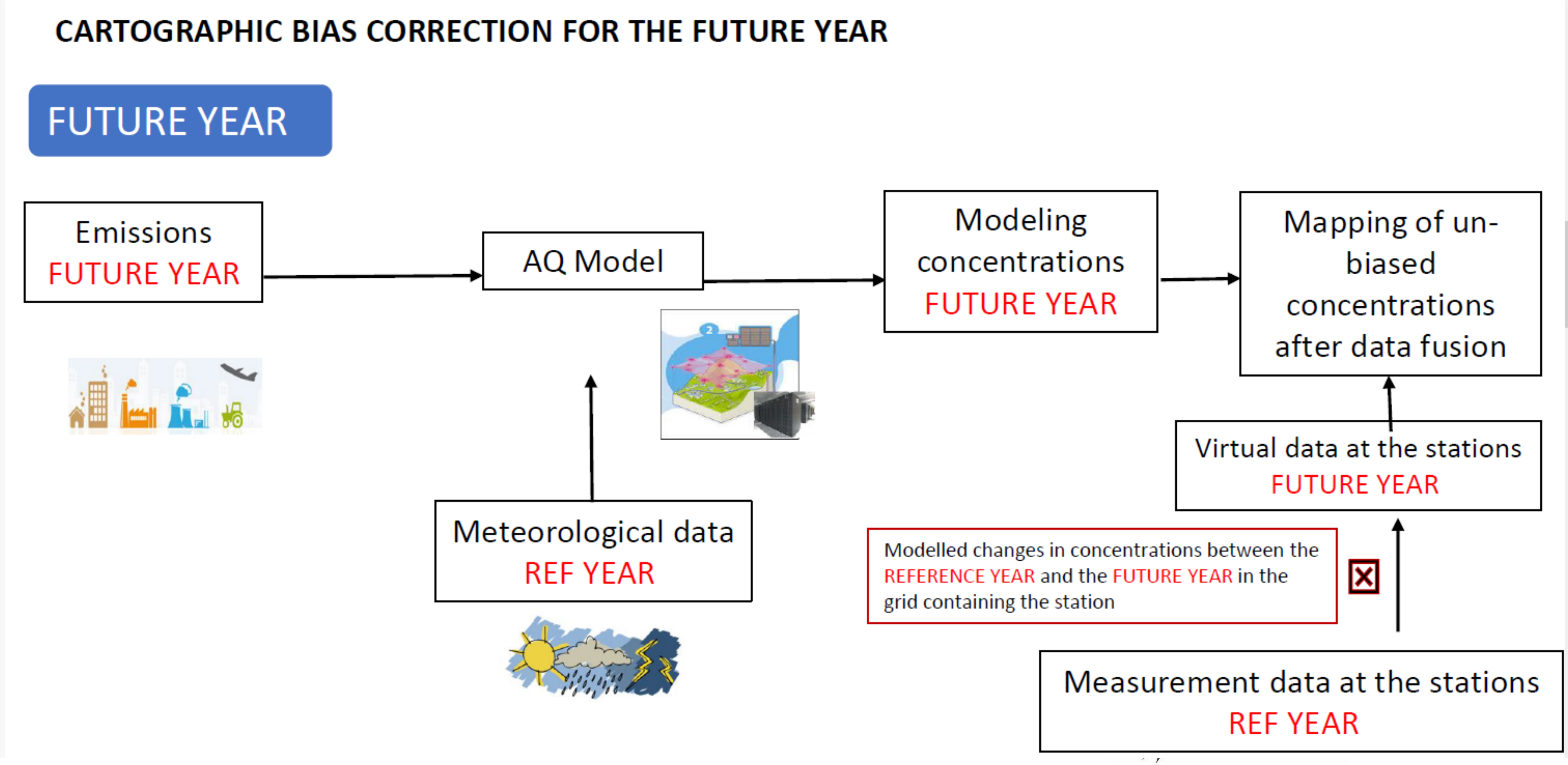
**For each scenario**

$M^{SCENARIO}_{j,k}$: direct model output

$M^{*\,SCENARIO}_{j,k} = M^{SCENARIO}_{j,k} x\, f_{j,k}$: adjusted model output



# French approach



**REFLEXION ON THE METHOD :**

- Bias propagation for future scenario: relative (%) or absolute ?

We could apply the propagation of the bias in relative terms (%) only to the mitigable part :

1) calculation of the modelled biogenic part in µg/m3 for the reference year
2) removal of the biogenic part of the modelled concentrations and calculation of changes in concentrations in %

That would mean that the modelled biogenic fraction would not be corrected by the bias correction

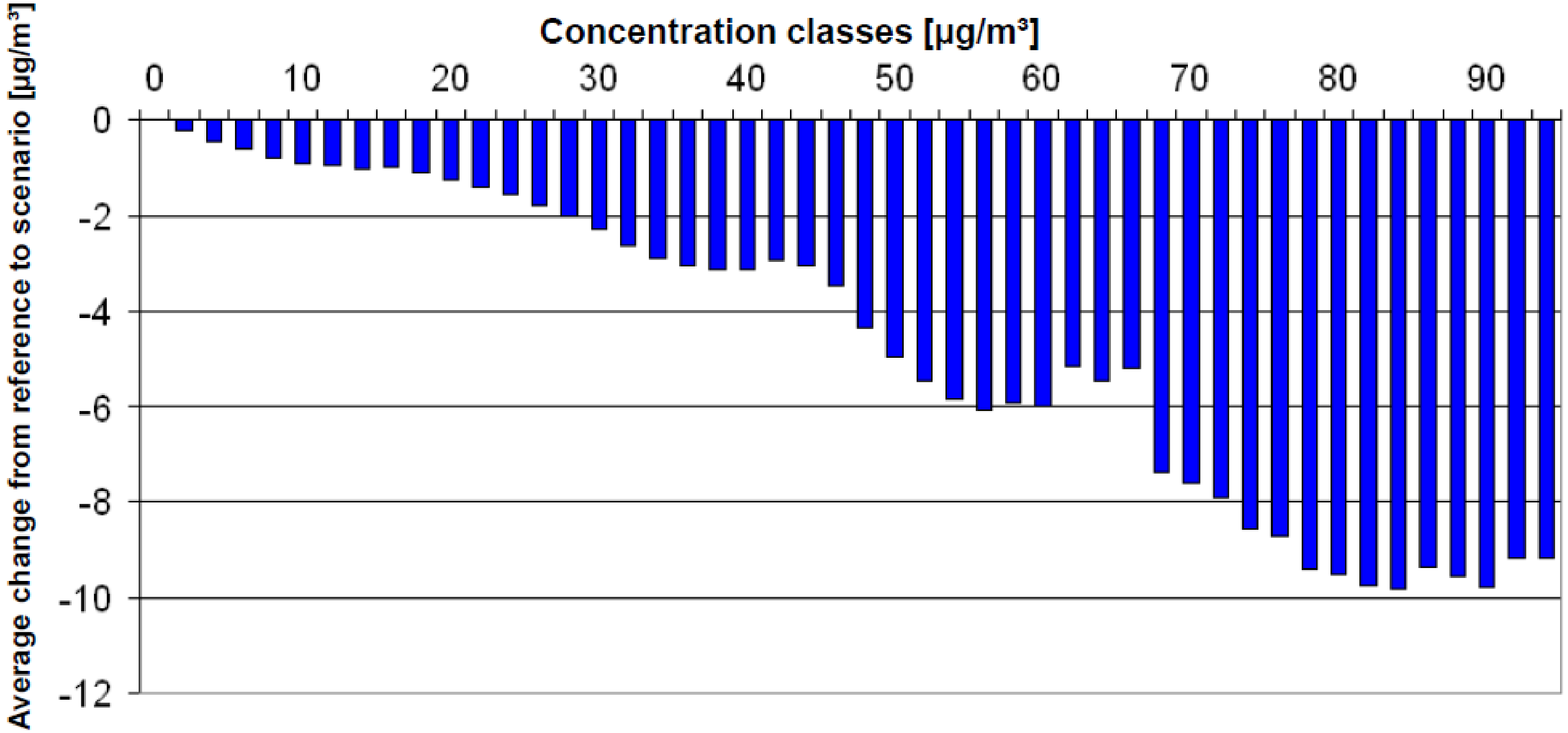
# German approach

„Delta-Method“

- developed by Rainer Stern
  Stern, R.: Großräumige PM10-Ausbreitungsmodellierung: Abschätzung der gegenwärtigen Immissionsbelastung in Europa und Prognose bis 2010; in: “Feinstaub und Stickstoffdioxid. Wirkung – Quellen – Luftreinhaltepläne – Minderungsmaßnahmen”, Hrsg.: DIN Deutsches Institut für Normung e.V., KRdL Kommission Reinhaltung der Luft im VDI und DIN; Beuth Verlag GmbH Berlin Wien Zürich; 85-102, 2006.
- often used in Germany
- rather simple approach
- idea:
  – do not create a complicated method to assimilate scenario data, but …
  – … create virtual future „measurement“ data and then use standard assimilation methods, e. g. OI

# Method

- generate histogram of modelled values, e. g. for classes of 2 µg/m³ (use all hourly values of entire model domain)
- for each class, determine average change in modelled values for this class: *scenario* - *reference*



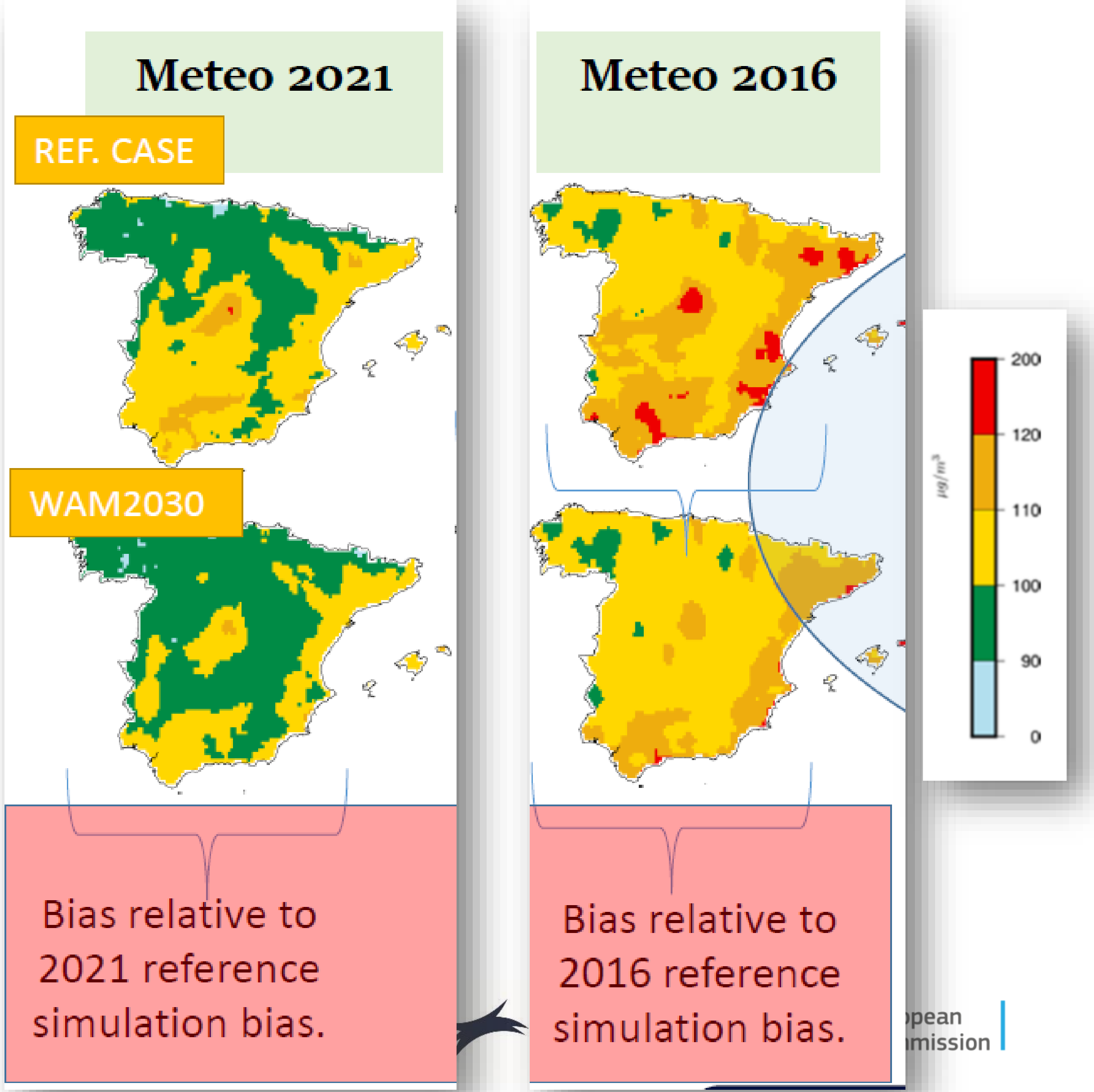

- generate virtual measurements in scenario case by changing each (hourly) measurement value by the average modelled change for the class of the measurement value

# Spanish approach

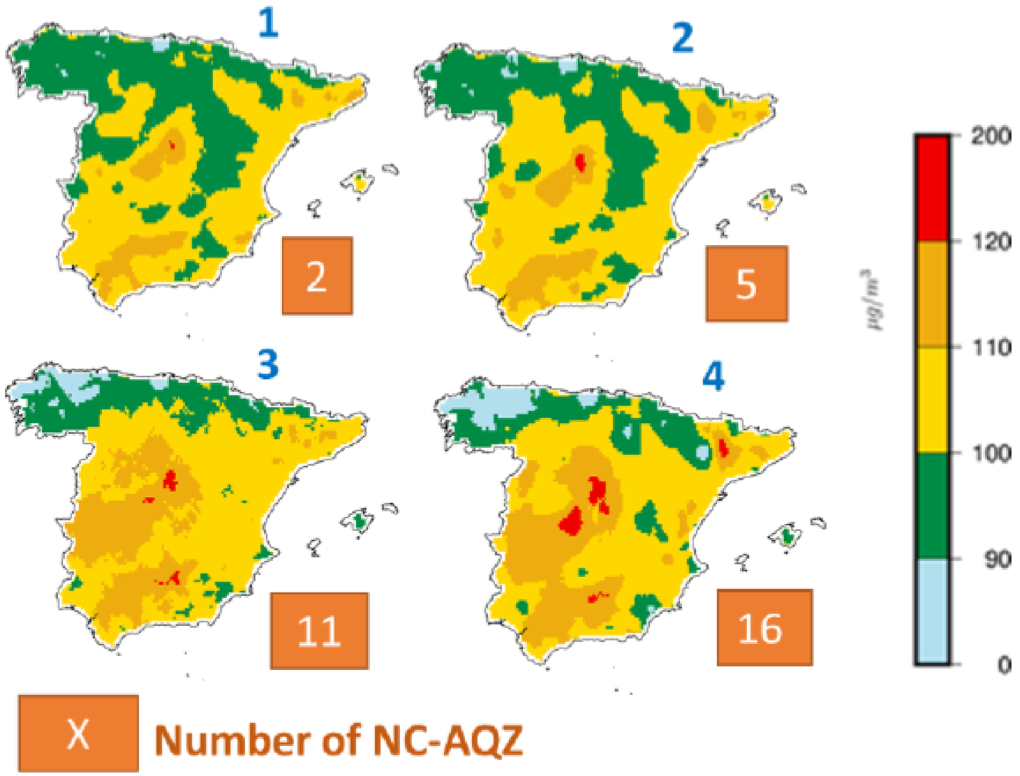
CM(2021) = M(2021) + R(2021)

CM(2030) = M(2030) + R(2021) M(2030)/M(2021)

CM: CORRECTED MODEL
M: MODEL
R: RESIDUAL (O-M)



## Different ways of doing the kriging of residuals



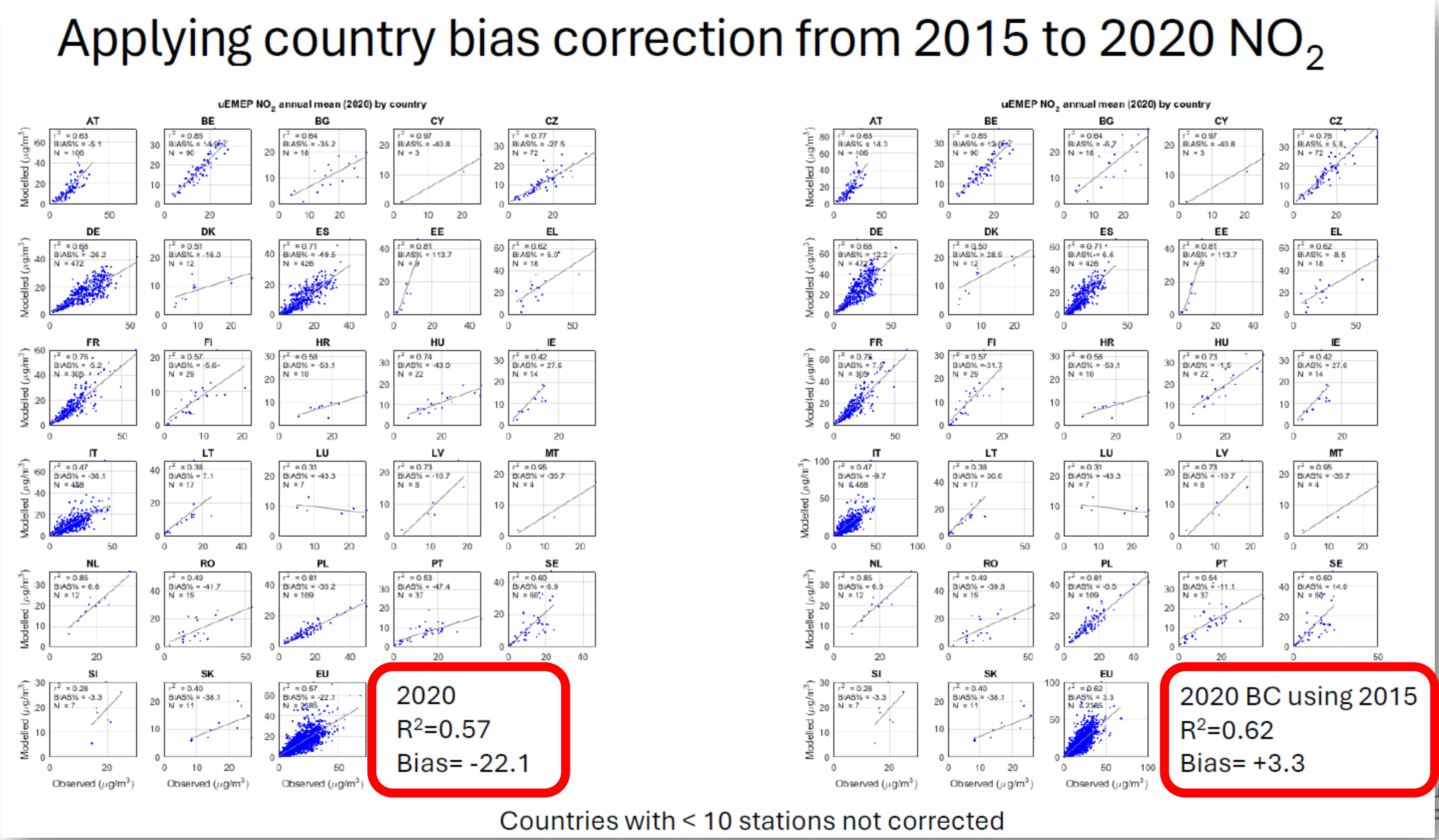

**1**: Python (MC75): Ordinary Kriging; spherical model to fit the experimental semivariogram (automatic fitting, varying bin distance)

**2**: Surfer Manual (MCSMA75): Ordinary Kriging; spherical model to fit the experimental semivariogram (manual fitting, varying: range, nugget, sill...)

**3**: ArcGIS (MCAOK75): Ordinary Kriging; stable model to fit the experimental semivariogram (automatic fitting)

**4**: Surfer Auto (MCSAU75): Ordinary Kriging; spherical model to fit the experimental semivariogram (automatic fitting)

# Verification of bias correction method @station locations
*(AAQD Impact Assessment by MetNo):*

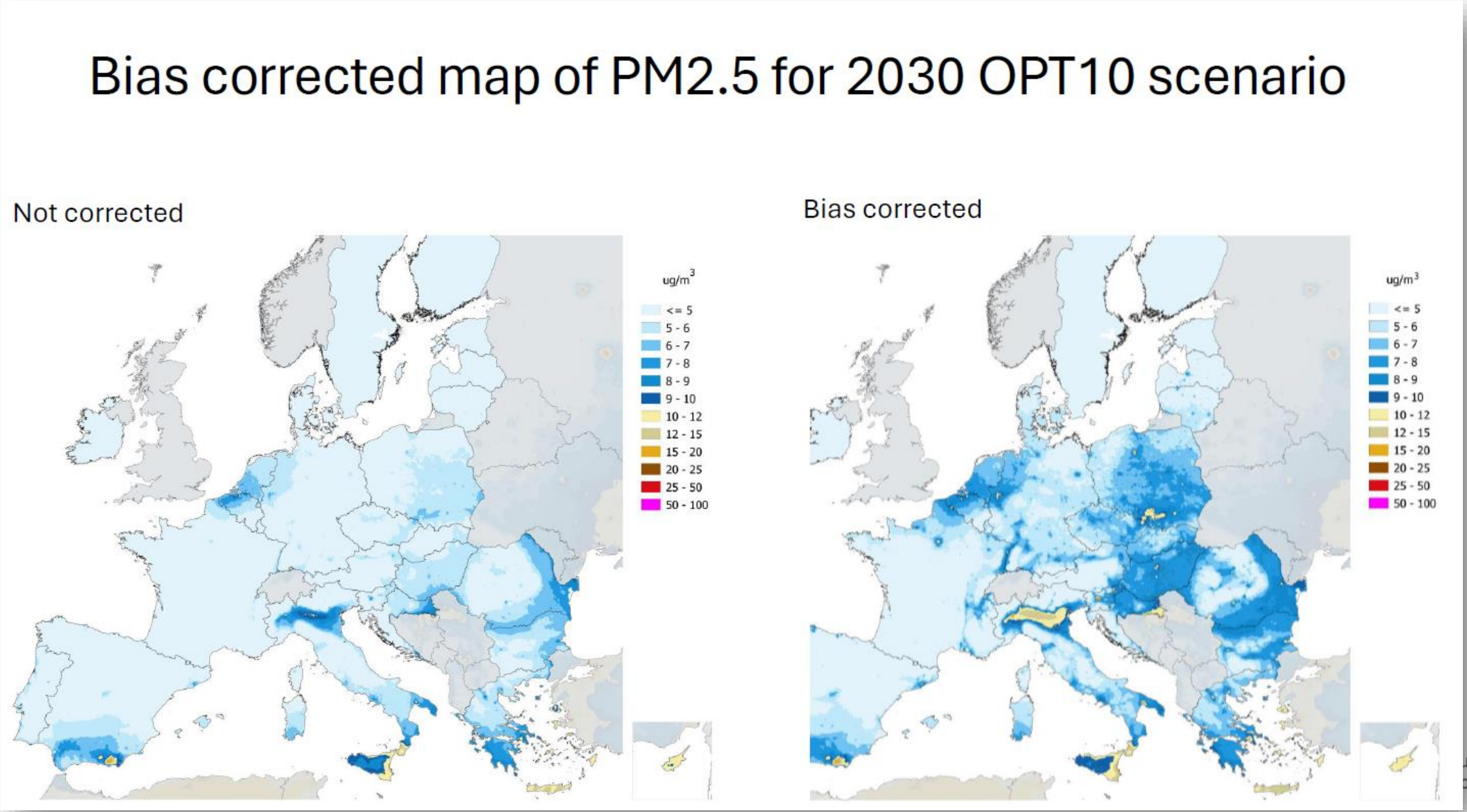


# Bias correction in AAQD

# Application in AAQD revision

- In the AAQD support for DG ENV we used scaling of **local concentrations per country** (average bias) because we thought that there may be a bias in the local modelling and variations between countries (which turned out to be the case)
- We also applied BC for 2 different years and also on updated models and emissions from CAO3
- An alternative ‘station scaling’ method was also applied at station sites
- BC derived from these methods was applied to the OPT10 2030 scenario

# Bias correction does matter for future compliance checking!



# AAQD revision: Example exceedances 2030 OPT10 for Europe $PM_{2.5}$

| **Calculation for station exceedance > 10 $\mu$g/m$^3$** | **Europe** |
|---|---|
| Total stations | 1014/1179 |
| AAQD original no bias correction | 29 |
| AAQD original bias corrected estimate (2015) | 69 |
| AAQD bias corrected estimate (2020) | 63 |
| AAQD station scaling | 53 |
| CAO3 no bias correction | 33 |
| CAO3 bias corrected estimate (2015) | 68 |
| CAO3 bias corrected estimate (2020) | 66 |
| CAO3 station scaling | 77 |

Bias correction doubles the number of stations in exceedance

Bias correction is consistent between year used

Bias correction is consistent between model versions

Not as robust per country

# AAQD revision: Example exceedances 2030 OPT10 for Europe $NO_2$

| **Calculation for station exceedance > 20 $\mu$g/m$^3$** | **Europe** |
|---|---|
| Total stations | 2406/2710 |
| AAQD original no bias correction | 46 |
| AAQD original bias corrected estimate (2015) | 97 |
| AAQD bias corrected estimate (2020) | 96 |
| AAQD station scaling | 56 |
| CAO3 no bias correction | 33 |
| CAO3 bias corrected estimate (2015) | 96 |
| CAO3 bias corrected estimate (2020) | 76 |
| CAO3 station scaling | 49 |

Bias correction doubles the number of stations in exceedance

Bias correction is consistent between year used

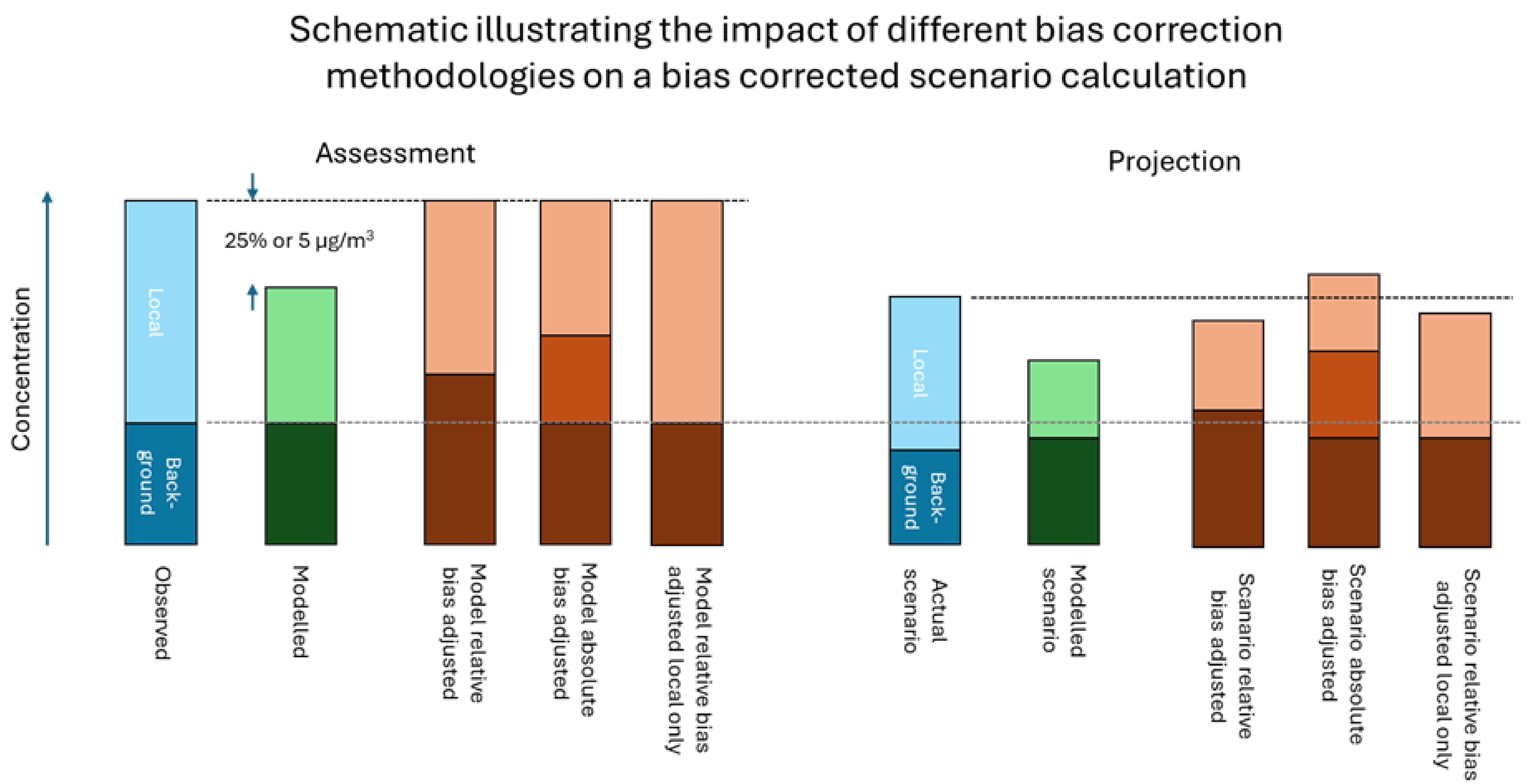
Bias correction is consistent between model versions

Station scaling gives fewer exceedances

# Feedback Guidance Document

# Air quality plans in the AAQD guidance document: Bias correction

- It is recommended to implement bias correction for planning purposes
- A simple example of how this can be done, and is often done, was provided.
- Simple bias corrections at station sites can be:
  - a scaling correction of total concentrations
  - an absolute correction of total concentrations
  - a scaling of only local concentrations
- These three cases can have a physical meaning but without extra information and/or knowledge of what might be missing, or too much off, it is not possible to give a firm recommendation
- These simple methods were illustrated with a schematic diagram:


Schematic illustrating the impact of different bias correction methodologies on a bias corrected scenario calculation
Assessment
Projection
Concentration
25% or 5 µg/m3
Local
Back-ground
Observed
Modelled
Model relative bias adjusted
Model absolute bias adjusted
Model relative bias adjusted local only
Local
Back-ground
Actual scenario
Modelled scenario
Scenario relative bias adjusted
Scenario absolute bias adjusted
Scenario relative bias adjusted local only

# Comments made on bias correction

- A request for the exact formulas used was asked for
- A request for much more detail, explanation, references and examples was asked for
- It was pointed out, and rightly so, that there are other methods for bias correction (mentioned GAM and AI)
- The bias correction presented was only applicable at station sites. No real guidance was given on how to implement bias correction spatially for mapping purposes. Needed more detail and references here.

# Group discussion towards “Best Practices & Recommendations”

- Split in 3 (or 4) groups
- Appoint a rapporteur
- Answer 4 questions
- Provide plenary feedback

# Questions to be addressed

- Q1: Is a bias correction needed in future projections?
- Q2: Are there recommendations for a relative or absolute bias?
  - Q2bis: Do we need a source apportionment to refine the bias correction? Is this realistic in practices?
- Q3: What can be recommended for the extrapolation of the bias at station locations towards a full map?
- Q4: What would be a good benchmark strategy to validate the bias projection approach?

# Discussion feedback

# Questions to be addressed

- Q1: Is a bias correction needed in future projections?
  - Yes, no discussion
  - Almost consensus, but don’t use it when a model is really biased and not fit-for-purpose
  - Yes, it is important

# Questions to be addressed

- Q2: Are there recommendations for a relative or absolute bias?
  - For O3 absolute bias, relative for the rest
  - Important to further improve meteo & emission
  - First try to understand where bias is coming from
  - Absolute bias will not disappear in the future.
  - Don’t make it too complicated!
  - Understand bias before deciding the approach

# Questions to be addressed

- Q2bis: Do we need a source apportionment to refine the bias correction? Is this realistic in practices?
  - SA might be complicated in practice!
  - Local versus background or natural versus anthropogenic
  - Not feasible in practice

# Questions to be addressed

- Q3: What can be recommended for the extrapolation of the bias at station locations towards a full map?
  - Link with WG6
  - Not formally requested by the AAQD → only evaluation at station locations
  - Recommendation for simple approach applicable in all MS
  - Be careful not to extrapolate a large bias in an urban station to rural areas
  - No clear recommendations

# Questions to be addressed

- Q4: What would be a good benchmark strategy to validate the bias projection approach?
  - Difficult
  - Work with historical data sets → lessons learnt by WG6?
  - Validation of historic time series require some attention
  - Do a blind test and work with synthetic results → *idea will be further elaborated*
  - Important but no clear idea on how to approach

# Next steps

A two step approach:

1. Work with synthetic data (provided by JRC) as truth and perturbated results that can be given to participants to test their bias definition and interpolation methods. The bias corrected results can be compared to the synthetic truth.

2. Design a cook book for a dynamic evolution on historic data.
    - Reuse as much as possible existing data in MS
    - Account for variations meteo when comparing emission changes to observations

# Guidance Document

# Open issues related to Planning

# Air quality plans in the AAQD guidance document: Meteorology

- When modelling future scenarios some choice of meteorology must be made. This can include:
  - Using the assessment year when the exceedance occured as reference year
  - Using a worst case meteorological year
  - Using a ‘representative’ meteorological year
  - Using 3-5 consecutive years (in line with exceedance assessment and captures meteorological variability)
- Other aspects of of the Directive can quickly lead to the need for multiple years, for example the AEI (Average exposure indicator) is assessed over a 3 year period
- Also, if a different meteorological year(s) is chosen to the assessment year then the assessment year must be recalcalculated as reference

# Comments made on meteorology

- Request for clearer guidance on meteorology
- Should meteorological variability be part of the uncertainty assessment for scenarios? The guidance inferres it should, but DG ENV and other commentators do not. This begs the question: ‘Should limit values be attained under all likely meteorological conditions or is it sufficient to show they will be attained just for the assessment year’?
- Using more than the assessment year meteorology is too much of a computational and financial burden for most and will simply not be done
- My favourite quote in regard to uncertainty in scenarios from meteorology:
    - ‘*as a guidance document: what do you intend with this section. It does not give guidance but rather creates uncertainty!*’

# Meteorology planning questions

- Meteorology, years to apply for planning?
  - the assessment year (simplest)
  - 3-5 years (recommended)
  - a representative year (may not capture the initial exceedance)
  - worst case meteorological year (worst case for what? will likely not be the assessment year)
- Meteorology and Average Exposure Indicator assessed over 3 years
  - 3 years of meteo needed?
  - Emissions from 2020 needed?
- To what extent should meteorological variability be assessed?
  - Not at all?
  - Based on multiple year calculations?
  - Based on an estimates from measurements?

# Other planning questions

- Where to get future scenarios for regional emissions and background concentrations from?
  - Should a central repository be produced for Europe?
  - If so who? IIASA? CEIP? CAMS? EMEP?
- What is required for the uncertainty and the best/likely/worst case projections written in the Directives?
  - How to make the worst, best and most likely projections?
  - Is this more qualitative than quantitative or necessary (*where possible*)?
  - Is this to include meteorology? Affects concentrations, but also some emissions are dependent on meteorology, e.g. residential heating, non-exhaust emissions, ammonia emissions
- ?

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

# Agenda

- Short introduction to the subject (Joana)
- AQ plans: spatial scale and governance level (Joana)
- Country insights and experiences
  - Italy (Antonio Piersanti - ENEA)
  - Poland (Pawel Durka – IOS-PIB)
  - Sweden (Matt Ross-Jones - Naturvardsverket)
- Next steps & wrap up (Stijn & Joana)

# AQ plans integration at multi-level governance

- The contribution of cities to their own air pollution is dominating for NO2, often significant for PM10/PM2.5 (city-specific), and generally low for O3.

- A large part of urban air pollution comes from sources outside the city itself, especially precursor emissions of SIA and O3.

- Local measures are essential to improve air quality and may be sufficient to meet the air quality standard for NO2, where local contribution is dominant. However, to reach the WHO air quality guidelines for PM2.5 and O3, collaboration at the international, national, regional and city levels is necessary.

- Multi-level coordination of governance is also relevant for the implementation of the most efficient and cost-effective solutions.

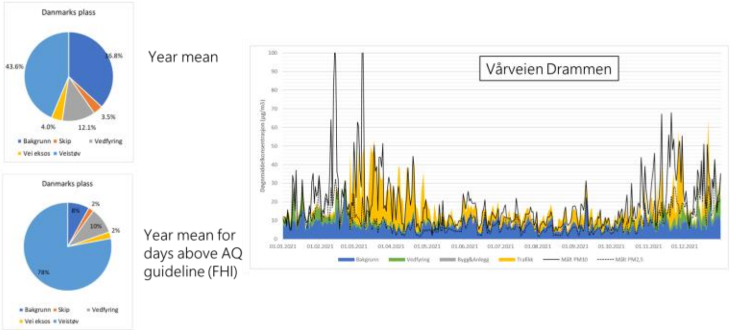
# Challenges

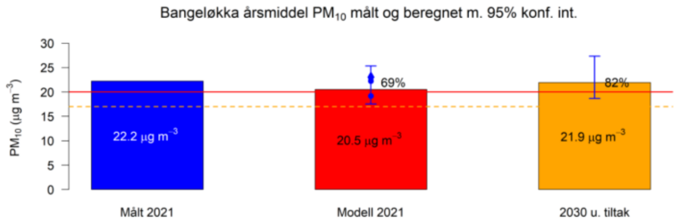
The success of an air quality plan depends on the availability of relevant knowledge.

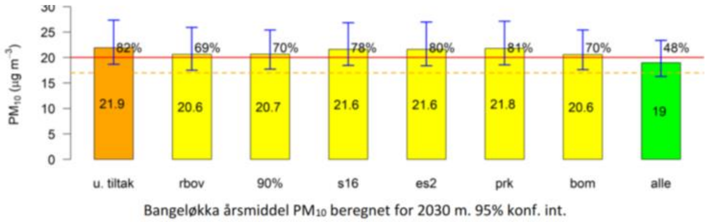
1) (main) sources of air pollution

2) future changes in emissions and concentrations are expected with the existing policy

3) options available to further reduce concentrations



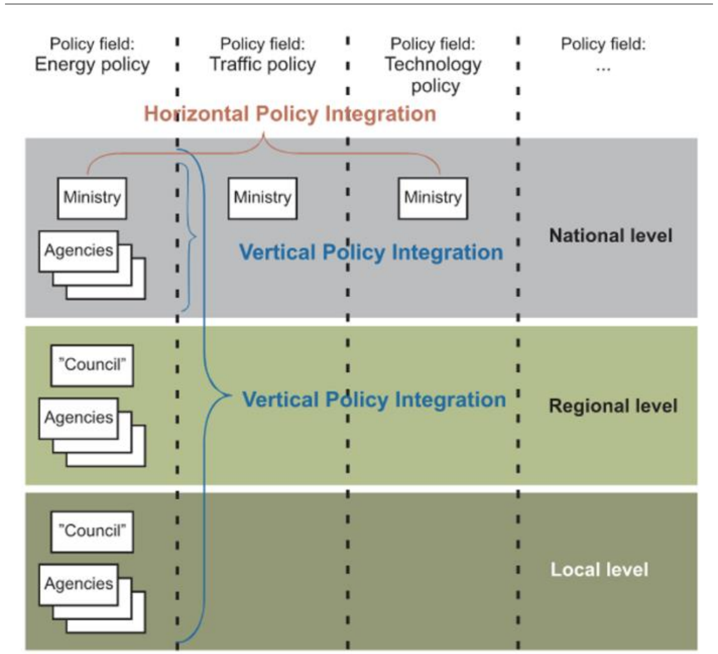



# Challenges

The success of an air quality plan depends on the political process:

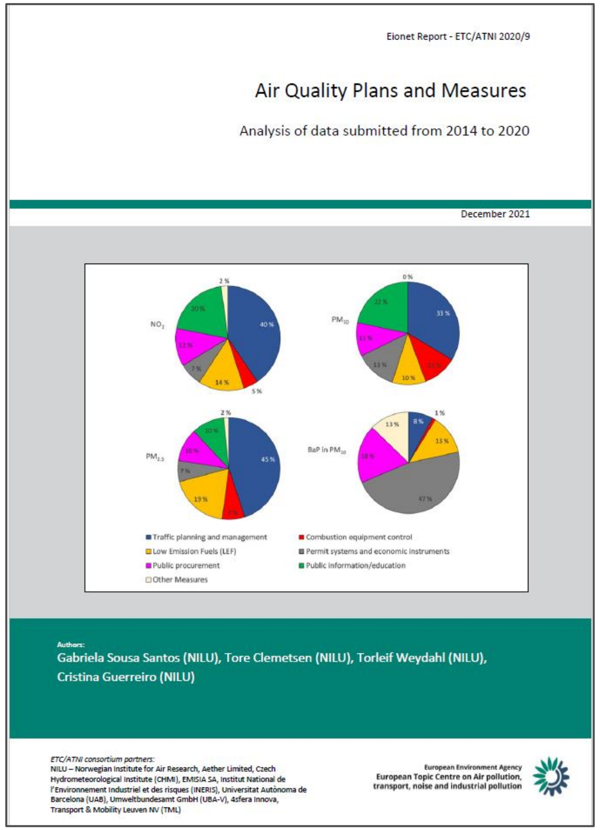
1. coordination of air quality managers and managers from sectors such as transport, energy, industry, and finance (horizontal integration)

2. coordination with different policy levels (local, regional, national, international) (vertical integration)




Beck et al (2009)

# AQ plans: spatial scale and governance level


Eionet Report - ETC/ATNI 2020/9

Air Quality Plans and Measures

Analysis of data submitted from 2014 to 2020

December 2021



Authors:
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ETC/ATNI consortium partners:
NILU – Norwegian Institute for Air Research, Aether Limited, Czech Hydrometeorological Institute (CHMI), EMISIA SA, Institut National de l'Environnement Industriel et des risques (INERIS), Universitat Autònoma de Barcelona (UAB), Umweltbundesamt GmbH (UBA-V), 4sfera Innova, Transport & Mobility Leuven NV (TML)

European Environment Agency
European Topic Centre on Air pollution, transport, noise and industrial pollution

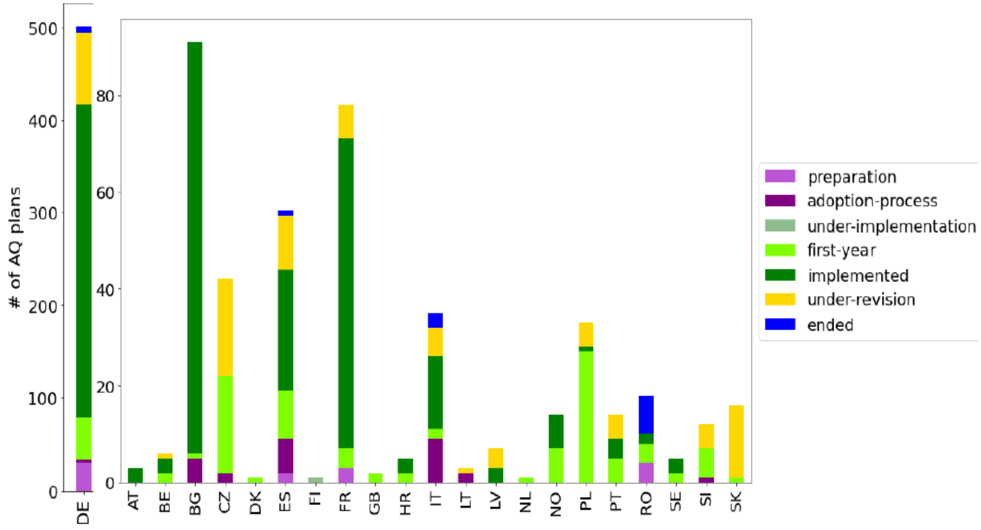
Collect information on AQ plans reported between 2014 and 2020 relating to:

- Exceedances (G)
- declared zones (dataflow H)
- source apportionment (dataflow I)
- attainment year (dataflow J)
- measures to improve air quality (dataflow K).

ETC/ATNI Report 9/2020

# AQ exceedances and Plans reported between 2010 and 2020

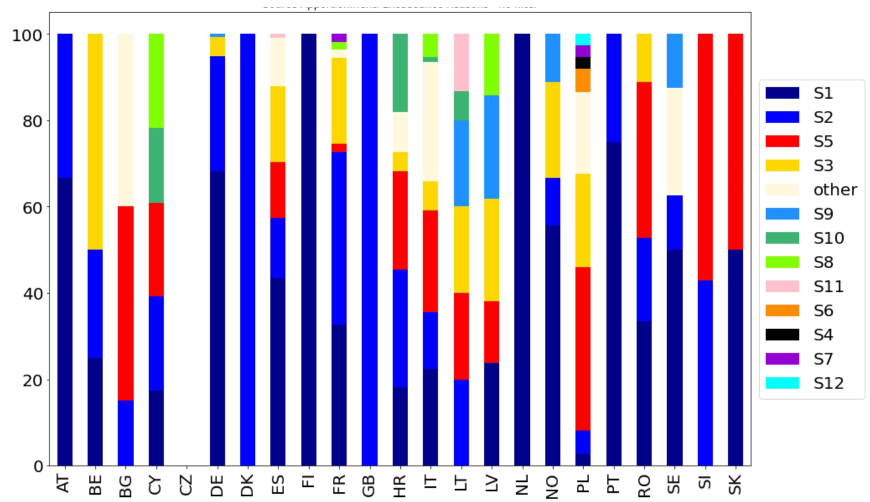
## AQ plans (#, status of implementation) reported in dataflow K (measures)




- large number of plans have been implemented (59 %)
- 17% were under revision

## Exceedances (#, reason) reported in dataflow I (source apportionment)

| Notation | Number of exceedances | Percentage |
|---|---|---|
| $NO_2$ | 428 | 63 |
| $PM_{10}$ | 215 | 32 |
| $PM_{2.5}$ | 10 | 1 |
| $O_3$ | 9 | 1 |
| BaP (in $PM_{10}$) | 7 | 1 |
| Ni (in $PM_{10}$) | 5 | 1 |
| Pb (in $PM_{10}$) | 2 | 0 |
| Cd (in $PM_{10}$) | 1 | 0 |
| $SO_2$ | 1 | 0 |
| $C_6H_6$ | 1 | 0 |
| | 679 | |




- Traffic is the most common reason: 34 % heavily trafficked urban centre (S1) and 30 % proximity to a major road (S2).
- 14 % for domestic heating (S5) and 10 % for local industry, including power production (S3)

# AQ exceedances and Plans reported between 2010 and 2020

## spatial scale of measures

| Notation | Further information | Number of measures with pollutants identification | Percentage |
|---|---|---|---|
| national | | 363 | 5 |
| town | Town as part of a zone | 1696 | 22 |
| zone_agg | Zone/agglomeration | 2723 | 36 |
| local | | 2750 | 36 |
| | Total | 7532 | |

**Note:** ([a]) https://dd.eionet.europa.eu/vocabulary/aq/spatialscale

## Administrative level of measures

| Notation | Number of measures with pollutants identification | Percentage |
|---|---|---|
| national | 481 | 6 |
| regional | 2957 | 39 |
| local | 4094 | 54 |
| Total | 7532 | |

**Note:** ([a]) https://dd.eionet.europa.eu/vocabulary/aq/administrativelevel.

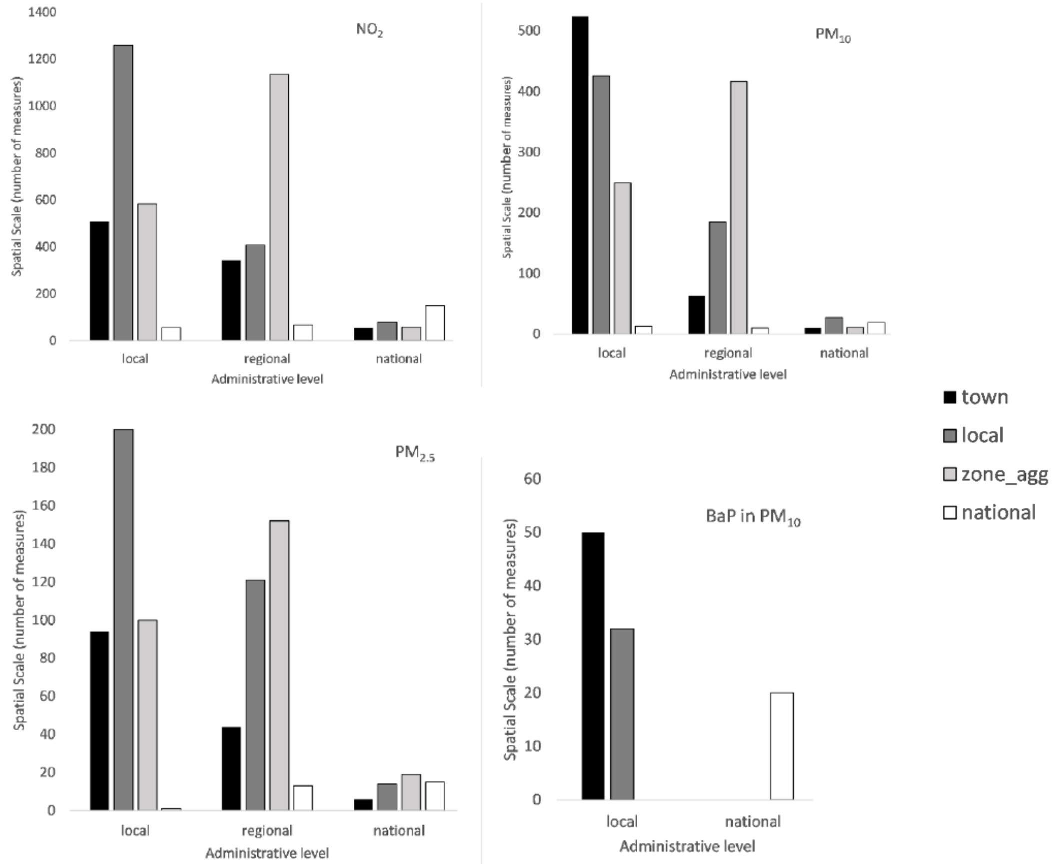
## Implementation mechanism or scope of the measure (type)

| Notation | Further information | Number of measures with pollutants identification | Percentage |
|---|---|---|---|
| coordinated | Coordinated measure with other Member States | 0 | 0 |
| sensitive | Measure geared at the protection of sensitive groups | 0 | 0 |
| short | Short-term measure | 20 | 0 |
| outside | Measure outside of Air quality or Short term Action Plan | 289 | 4 |
| other | Other | 514 | 7 |
| integrated | Measure integrated in Air Quality Plan | 6689 | 89 |
| | Total | 7512 | |

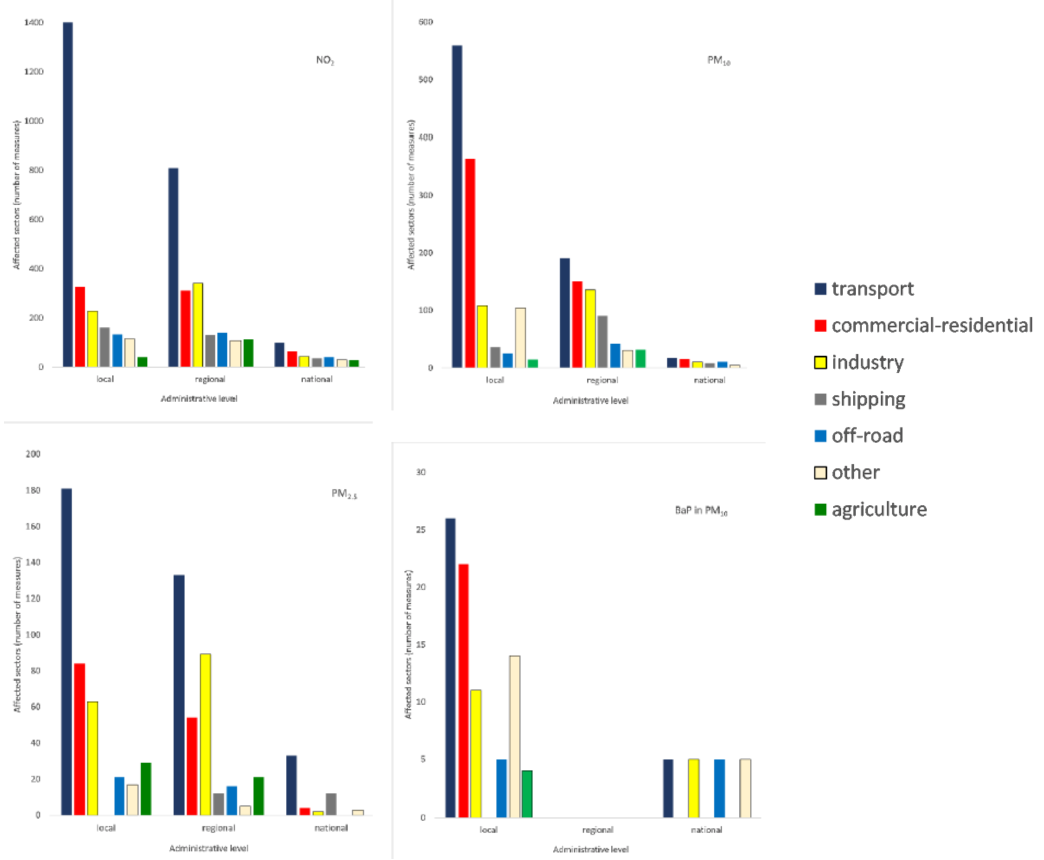
**Note:** ([a]) https://dd.eionet.europa.eu/vocabulary/aq/measuretype.

# AQ exceedances and Plans reported between 2010 and 2020 – NO2, PM, BaP

## Spatial scale vs governance level




## Spatial scale vs sector



# Country insights and experiences

**We are particularly interested in hearing about:**

- if integration is already in place or is progressing towards it, or not at all.
- the main challenges and obstacles to achieving effective integration.
- areas that require improvement to make this integration a reality.

ITALIAN NATIONAL AGENCY FOR NEW TECHNOLOGIES, ENERGY AND SUSTAINABLE ECONOMIC DEVELOPMENT

# WG5

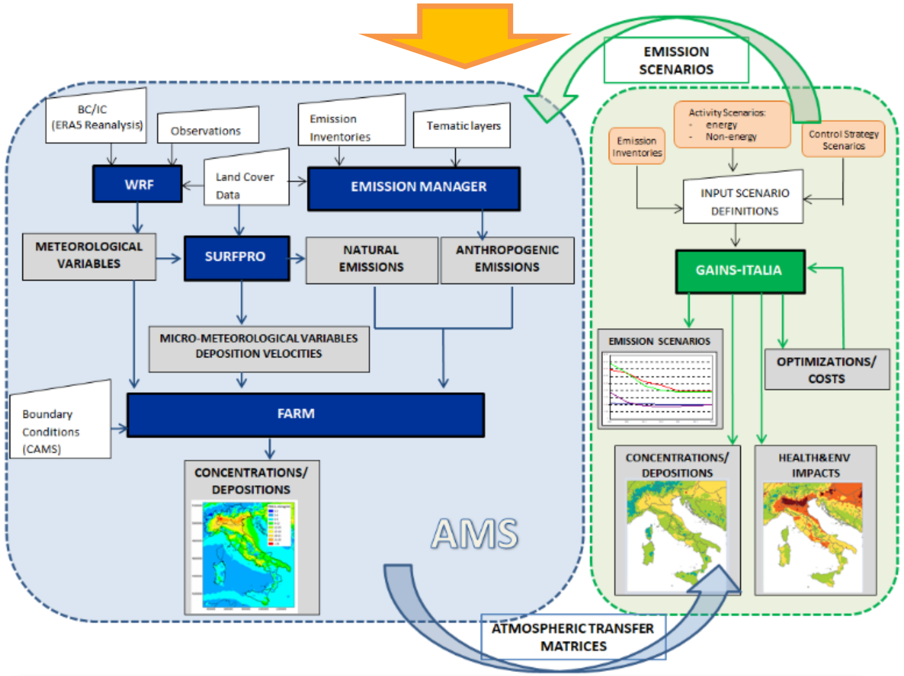
# National and Regional air quality plans in Italy

*FAIRMODE Technical Meeting*
*Dublin - Ireland, October 7-9 2024*

Antonio Piersanti, Ilaria D'Elia, Mihaela Mircea

# 2 levels for AQ plans

## NATIONAL LEVEL in charge of the National Air Pollution Control Programme and National emission scenarios (NECD)




### IAM system: MINNI

- National emission inventory
- **harmonization with regional emission inventories**
- National energy scenarios with European/national policies (energy, climate, agriculture..)
- **Current Legislation (CLE) emission scenarios, on top of which some Regional AQ Plans are developed**

MINNI MODEL
https://airqualitymodels.enea.it/

GAINS-Italy online
https://gains-italy.enea.it/gains4/IT4/index.login

Piersanti et al., 2021. Atmosphere, doi: 10.3390/atmos12020196
https://www.mdpi.com/2073-4433/12/2/196

## REGIONAL LEVEL in charge of Air Quality Management and Reporting (AAQD)

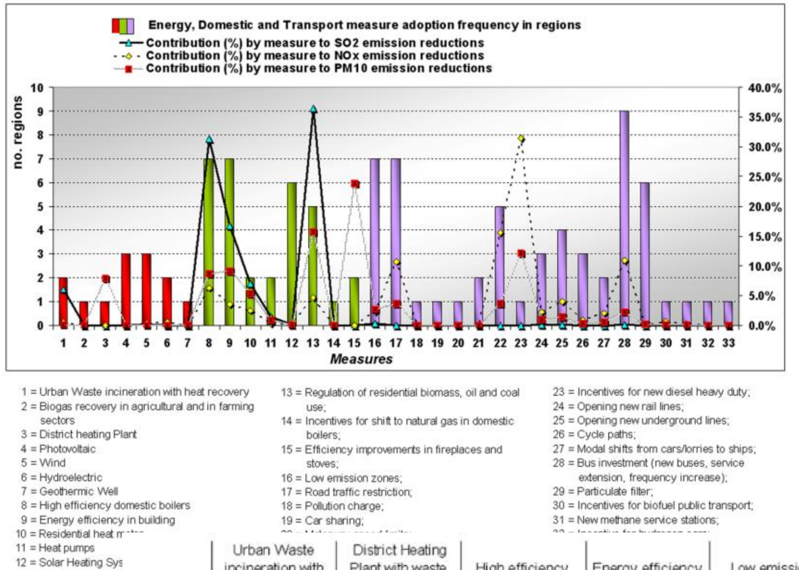
- 20 AQ Plans
- National/regional/local policies

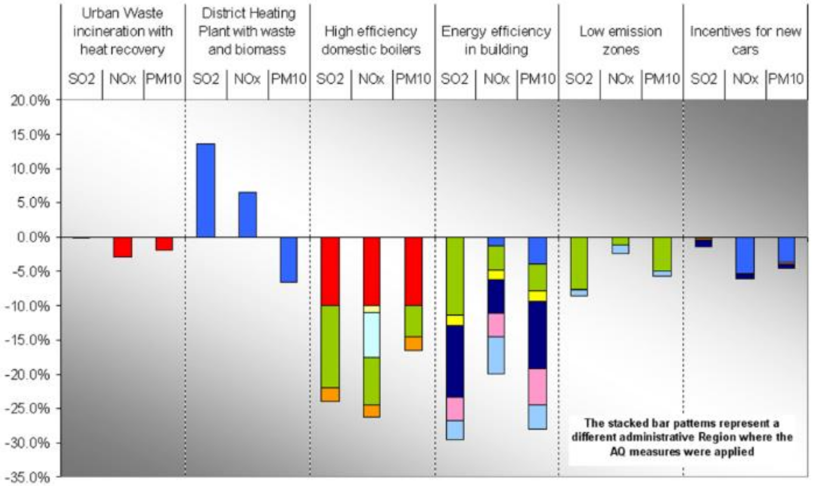
# How measures are selected

- National level, in the NAPCP: panel of Ministries – no use of AQ models (e.g. optimization tool in GAINS-Italy)
- Regional level: different approaches depending on Region, including optimization (RIAT tool)
- Integration/coordination of measures between national and regional level: no formal mechanism!

# Regional/local measures – some analyses by ENEA

## Analysis of Regional AQ measures



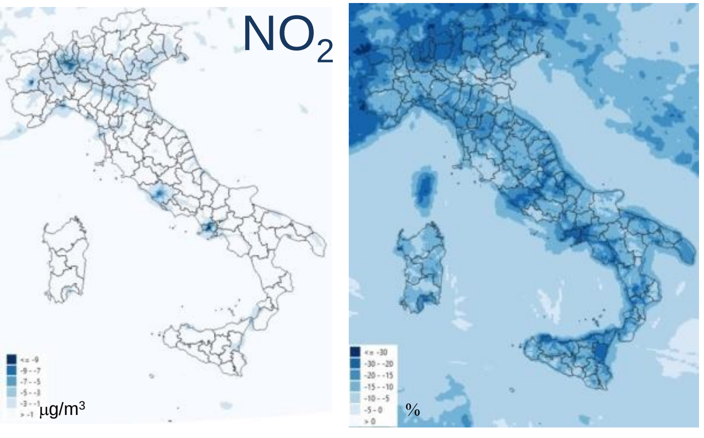



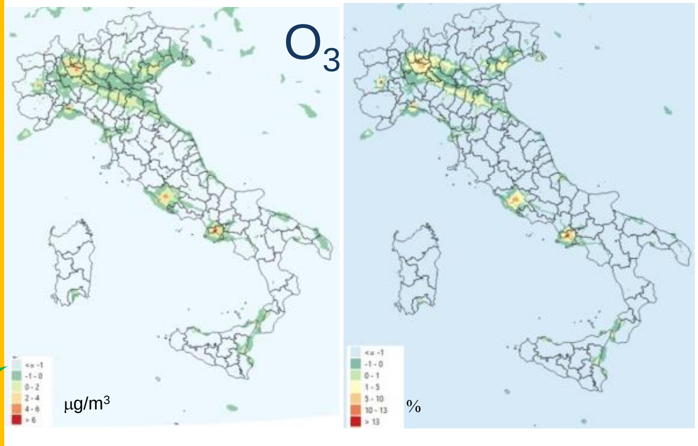

1. Same measure in different Regions = different efficacies
2. Technical Measures alone are not enough to meet targets = behavioural measures are necessary
3. the measures mostly adopted in the AQ plans do not always represent the most effective measures in reducing AQ concentrations

D'Elia et al., 2009, Atm Env, https://doi.org/10.1016/j.atmosenv.2009.09.003
D'Elia et al., 2018, Atm Poll Res, https://doi.org/10.1016/j.apr.2018.03.002

## The COVID experience

Reality as an extreme scenario: traffic almost zeroed = drop of urban $NO_2$ = rise of urban $O_3$



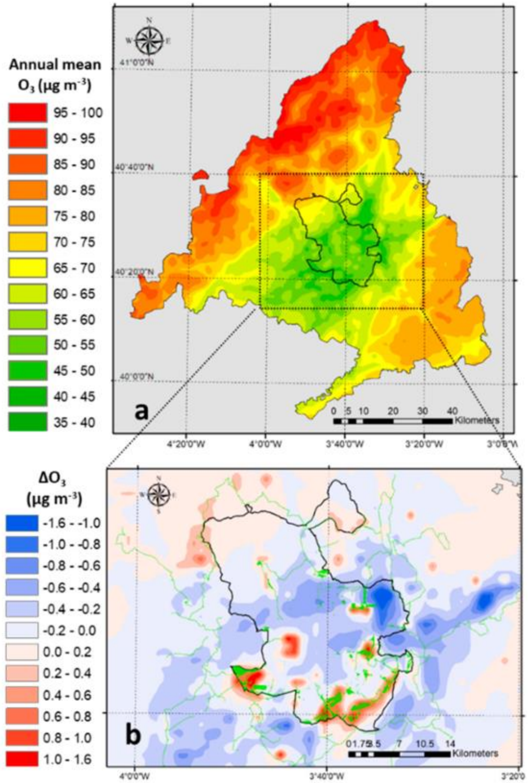

Effects on secondary pollutants should be carefully studied with integrated assessment models

D'Isidoro et al., 2022, APR, https://doi.org/10.1016/j.apr.2022.101620

# Regional/local measures – some analyses by ENEA

Vegetation for Urban Green Air Quality Plans
VegGap

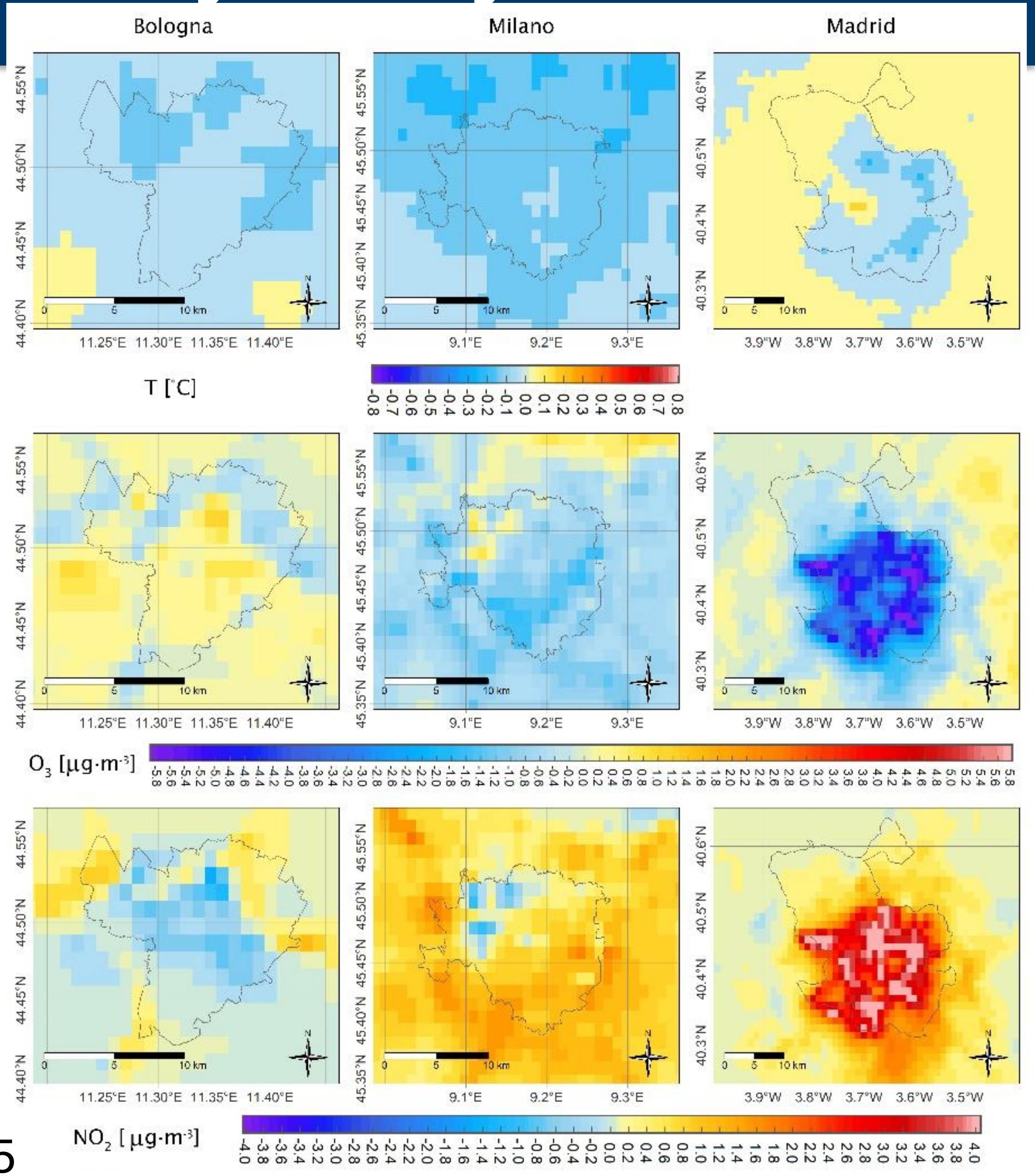
https://www.lifeveggap.eu




2015 yearly present vegetation

expected variation due to future vegetation

De la Paz et al. (2022)




July 2015 present vegetation

D'Isidoro&Mircea et al. (2023), Mircea et al. (2023)

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# Lessons learnt in Italy

- **Integration of policies** (on energy, air pollution and climate) is necessary to tackle possible negative effects on air quality and climate change → **far from there**
- Necessary **synergies at different level** from national to local → **ongoing, not there**
- The selection of measures is crucial → **not optimized in terms of cost-efficacy**
- **Model responses are robust** for policy support, for short and long term air quality plans, but still **not fully trusted/implemented**

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# Air Quality Plans - Poland

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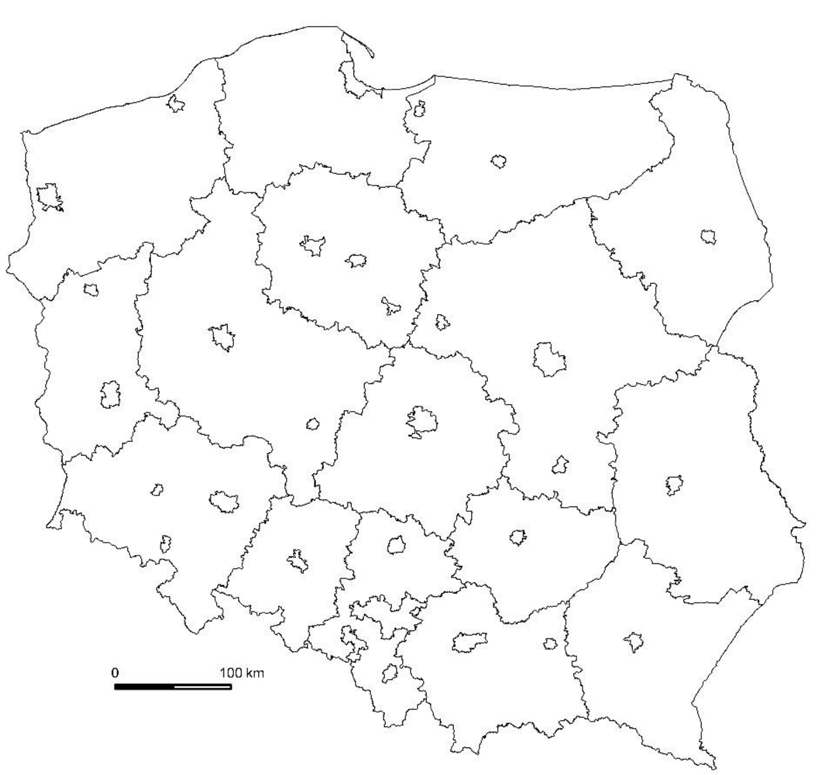
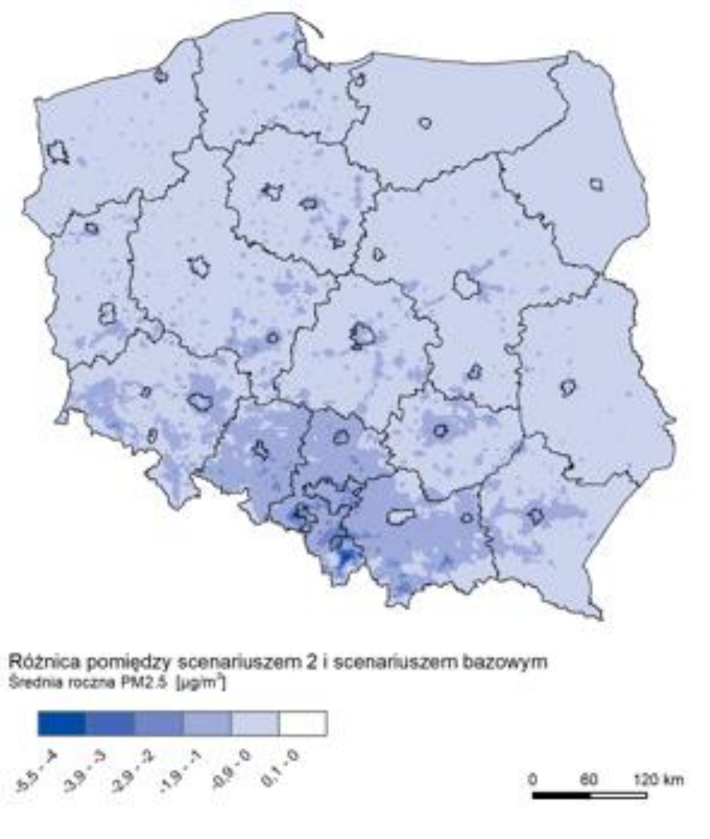
# Air Quality Plans – „fragmentary" plans

- Diseaggregation of AQ plans -16 subregions (regional zones) + 30 aglomerations (city zones – above 250 thousands inhabitants) = 46 zones/potential plans
- Hard to model it „well"
  - Use boundary conditions, or model bigger area (country?)
  - Taking in to account measures in other regions/zones
- Reporting to Eionet Central Data Repository could be a nightmare…
- There is no cooperation between governance levels as far as we know:
  - regions/zones are preparing the plan -> Ministry is receiving them -> IEP-NRI is reporting (on the request from Ministry).
  - There was a reviewing proces, but with no effect on the final plan



# Air Quality Plans – integration and challenges

- Integration in form of National Air Quality Plan:
  - Now: IEP-NRI is preparing the information based on „scenario” from ministry (joined impact of aq plans, clean air acts impact etc.) - no legal obligations based on results
  - Future plans: discussion with ministry is ongoing
- The main challenges and obstacles to achieving effective integration:
  - Cooperation between regions/state in country and outside of them
  - Acqusition of emission data after measures or, at least real reductions from regions and countries
- Areas that require improvement to make this integration a reality:
  - Cooperation channel, or at least formal „road” for it
  - Forum for information exchange: which measures worked, which does not etc.



# FAIRMODE

## WG5 AQ plans integration in Sweden

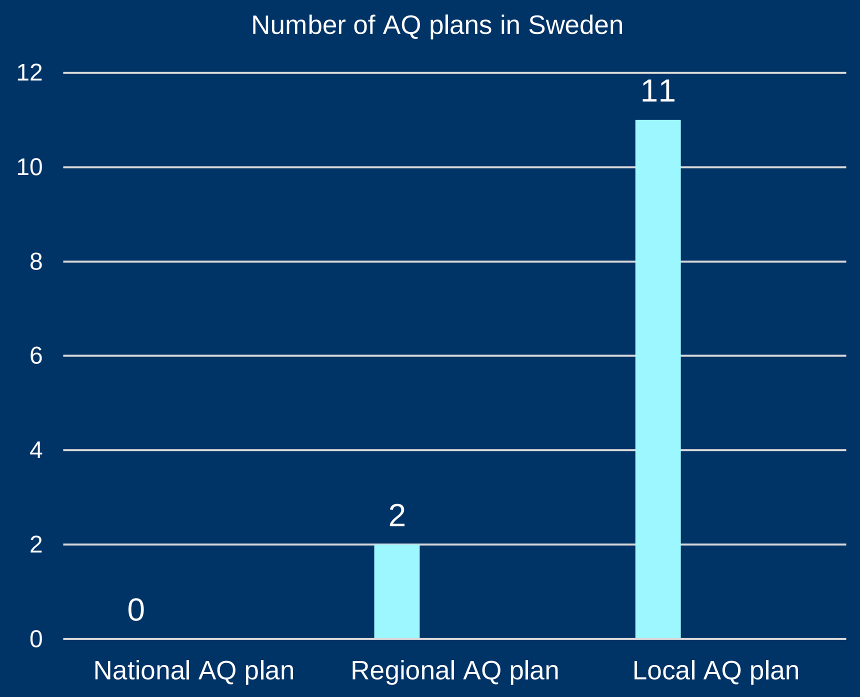
**Matthew Ross-Jones & Hilma Engholm**
**Swedish EPA**

NATUR VÅRDS VERKET
SWEDISH ENVIRONMENTAL PROTECTION AGENCY

# AQ plans in Sweden today

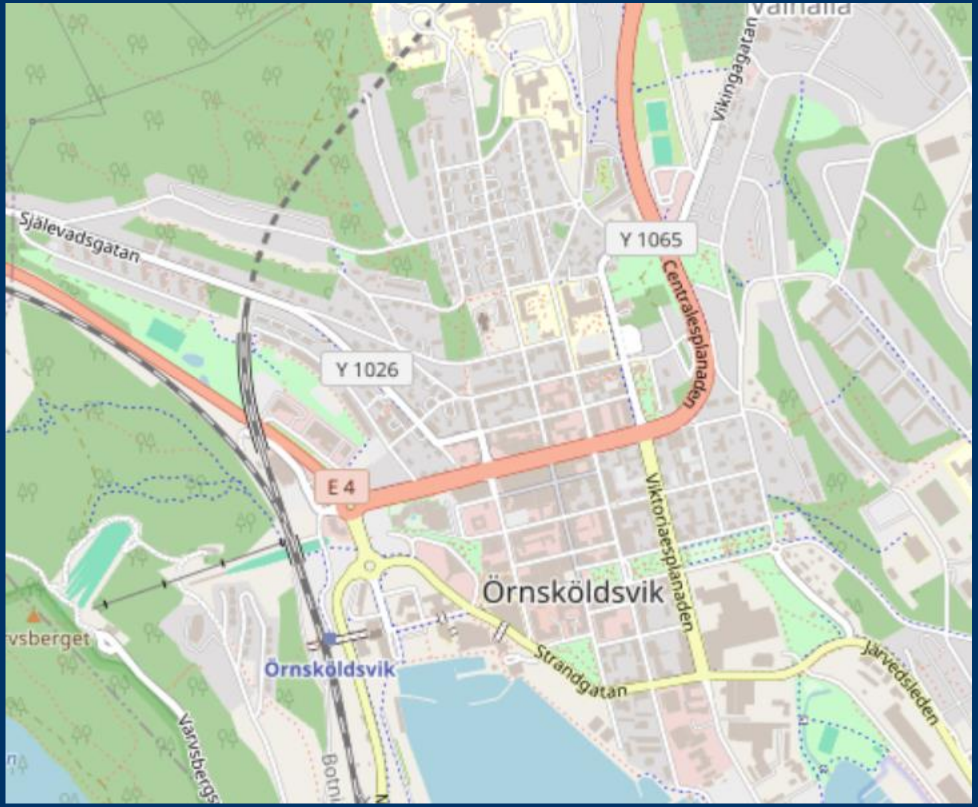
- In Sweden we have a fully decentralised AQ management system
- Municipalities in most cases responsible for AQ plans (local)
- The two biggest cities, Stockholm and Gothenburg, however have regional AQ plans

- The municipality/regions are responsible for development, implementation & review of AQ plans
- SEPA reports to the Commission and provides guidance on AQ planning



# Issues with today's system – an example

- Örnsköldsvik – a city in north of Sweden
- $NO_2$ and PM10 exceedances on a major road (national highway) running straight through the city centre (Centralesplanaden)
- Municipality responsible for the exceedance and AQ plan, but cannot alone implement measures on national roads.
- They can, however, do other local measures to reduce traffic in the city
- But they probably still need actions on the major road from the government to address the exceedance



# Proposal for AQ-plans in Sweden

**Issues with this system**

- High demands on municipalities, but not always the required remit/powers

- Municipalities have requested many national measures / granting of new powers, not yet delivered, e.g.:
  - Increased enforcement of studded tyre bans & LEZs
  - Studded tyre taxes / fees
  - Emission-differentiated congestion charges
  - Distance-based road abrasion tax

- Reporting of plans often incomplete

- Local knowledge is however important in AQ planning and is an advantage with the current system

# Proposal for AQ-plans in Sweden

In 2020, SEPA carried out a major review of the current framework for AQ assessment & management in Sweden and produced a large number of recommendations

**Suggestions for improvement**

- SEPA responsible for proposing a National AQ plan (at least every 4 years)
    - National overview of exceedances and on-going AQ plans and measures
    - Annual coordination meeting with national, regional & local stakeholders
    - Improve conditions for addressing exceedances that need national actions, e.g. Örnsköldsvik, and improve cost-effectiveness of action
    - Clearer link to our national AQ zones & more harmonised reporting
- A national AQ plan should provide a framework for a more cohesive and cost-effective system for AQ planning
- First step, national modelling study, completed 2024

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