FAIRMODE Update

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TFIAM Meeting, April 2021

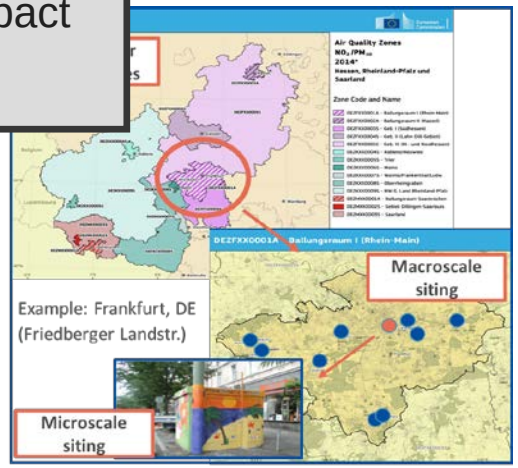
FAIRMODE has been created (2007) for exchanging experience and results from AQ modelling in the context of the EU Air Quality Directive between Member States, chaired by JRC

FAIRMODE
Forum for air quality modelling in Europe

Current context: revision of EU AQ Rules
Fitness check identified 5 shortcomings

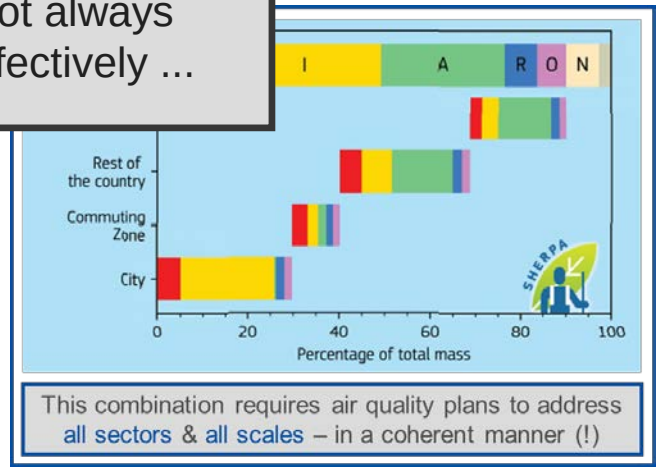
Assessment shortcomings

Flexibilities may sometimes impact the comparability of data …



Governance shortcomings

Air quality plans do not always address all sources effectively ...



Enforcement shortcomings

Exceedances are not always addressed sufficiently and/or on time …

Information shortcomings

Public feels under-informed about poor air quality and its impacts …

Health outcome shortcomings

EU Standards are not fully aligned with scientific advice …

Source(s): EU Commission – DG ENV

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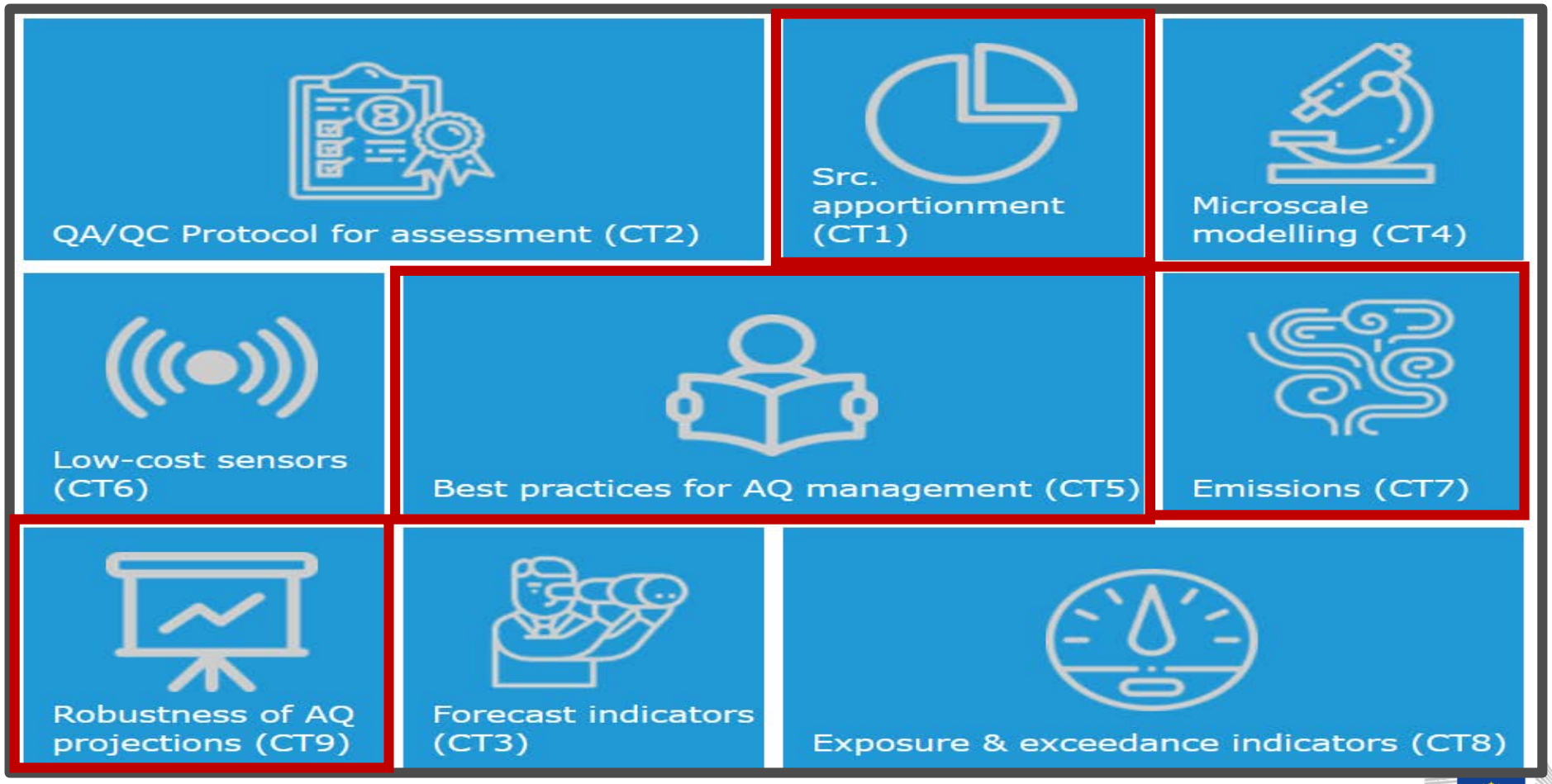
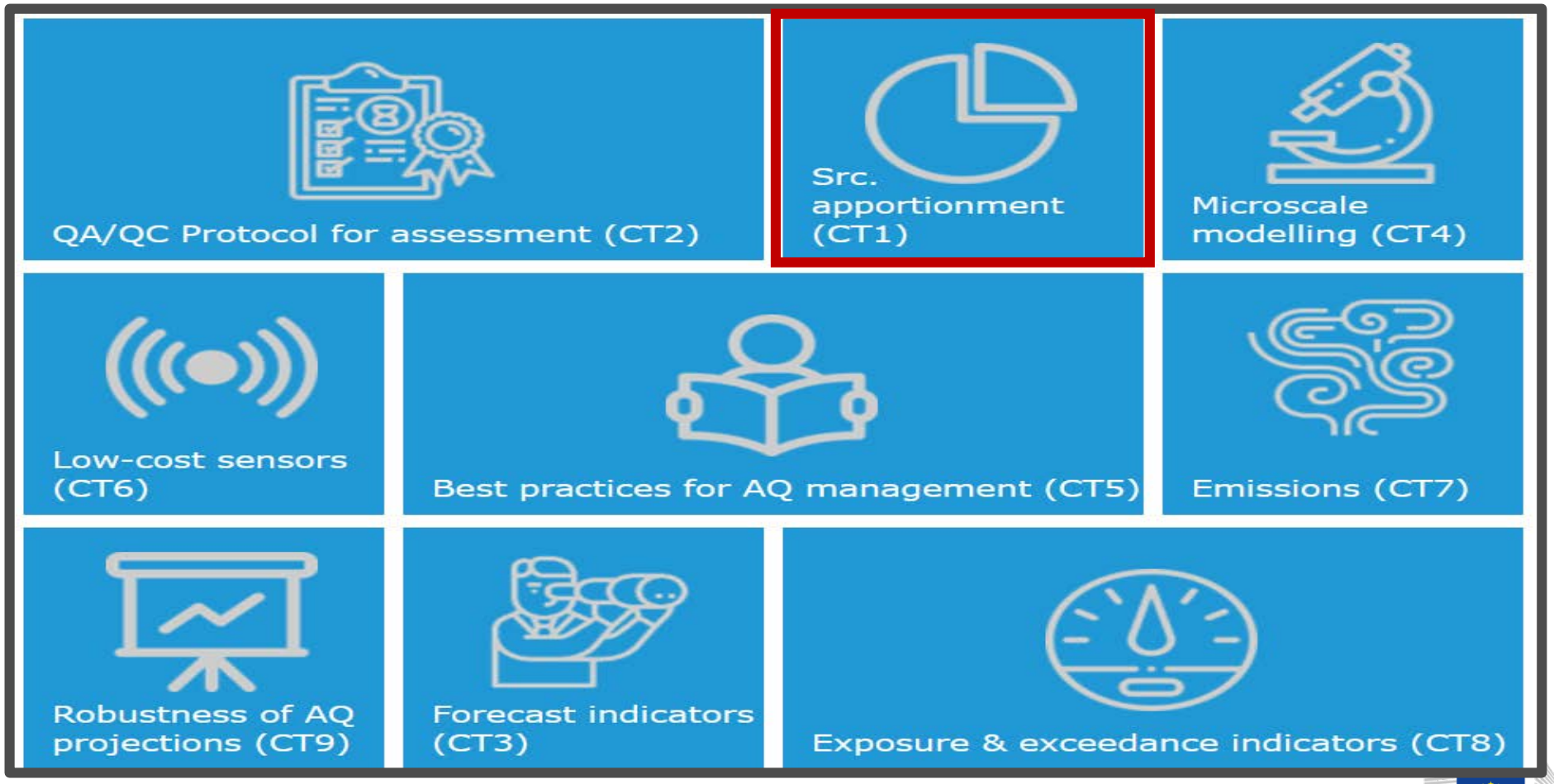
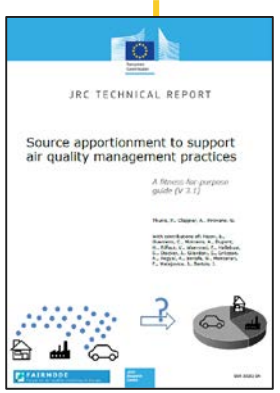
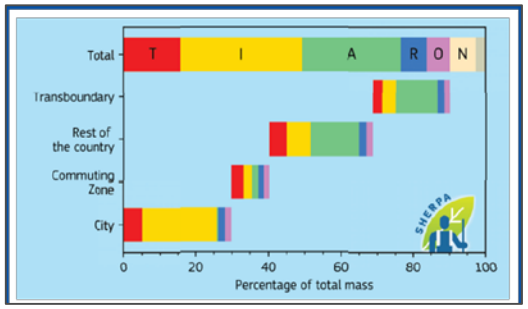


FAIRMODE Activities

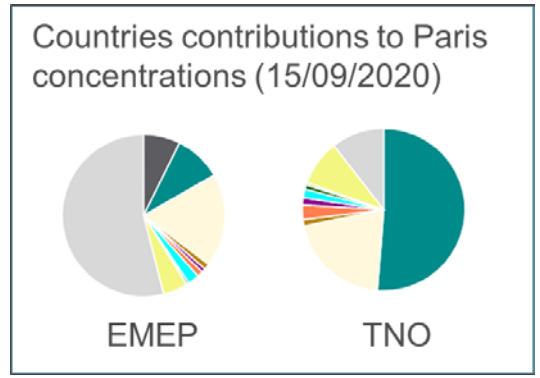


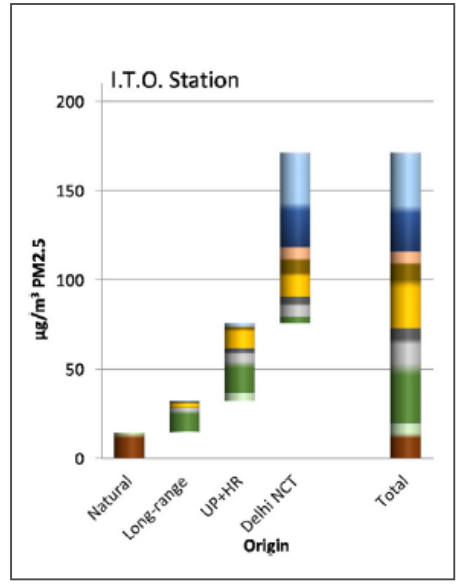


Source apportionment

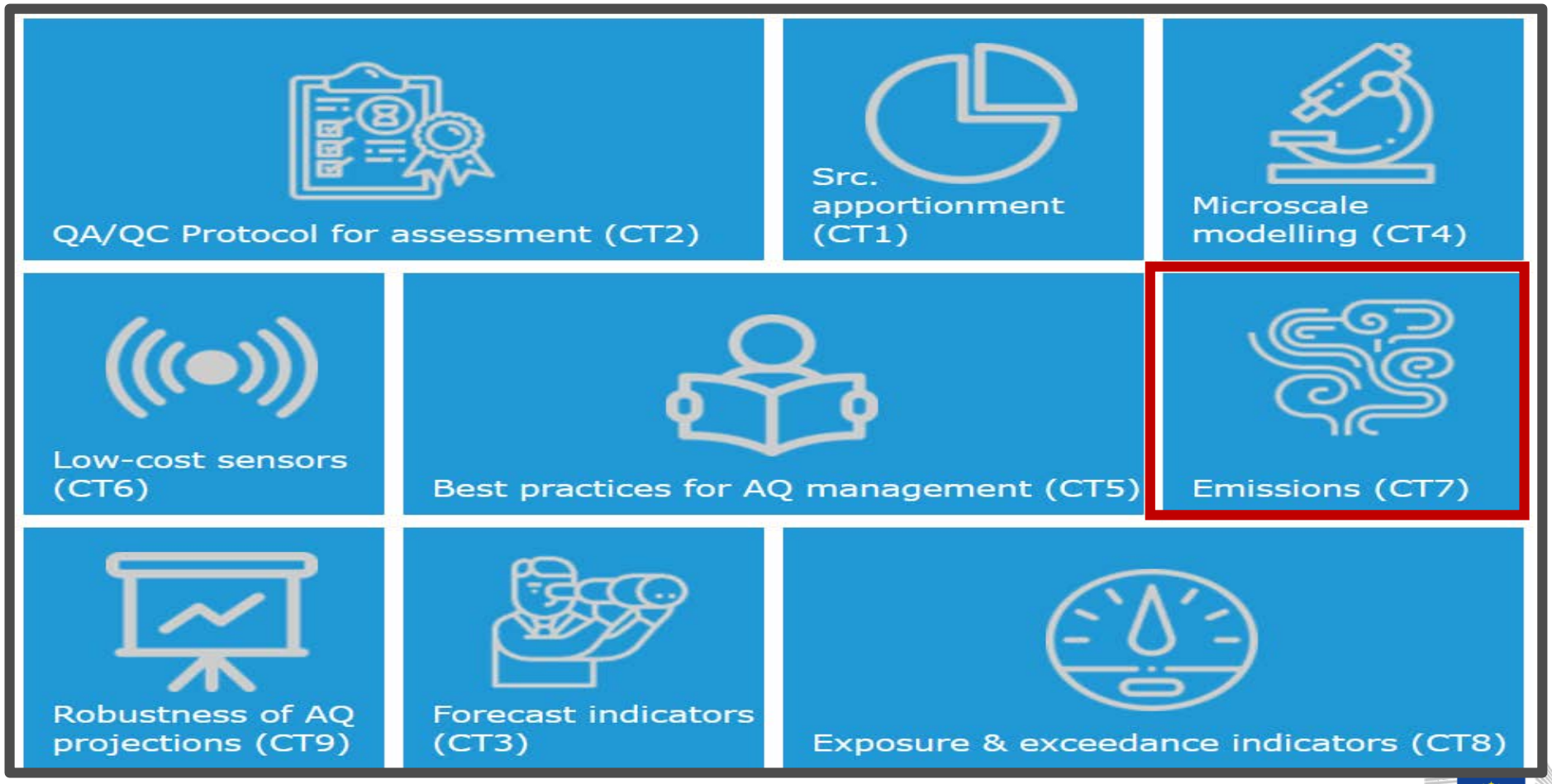


- Current guidance address the fitness-for-purpose of source apportionment methods
- Purpose: support to air quality planning
- Methods: brute force, tagging, increments and receptor modelling
- Ongoing inter-comparison exercise to generalize the findings of PM to NO2 and Nox
- Update of guidance document (end 2021)



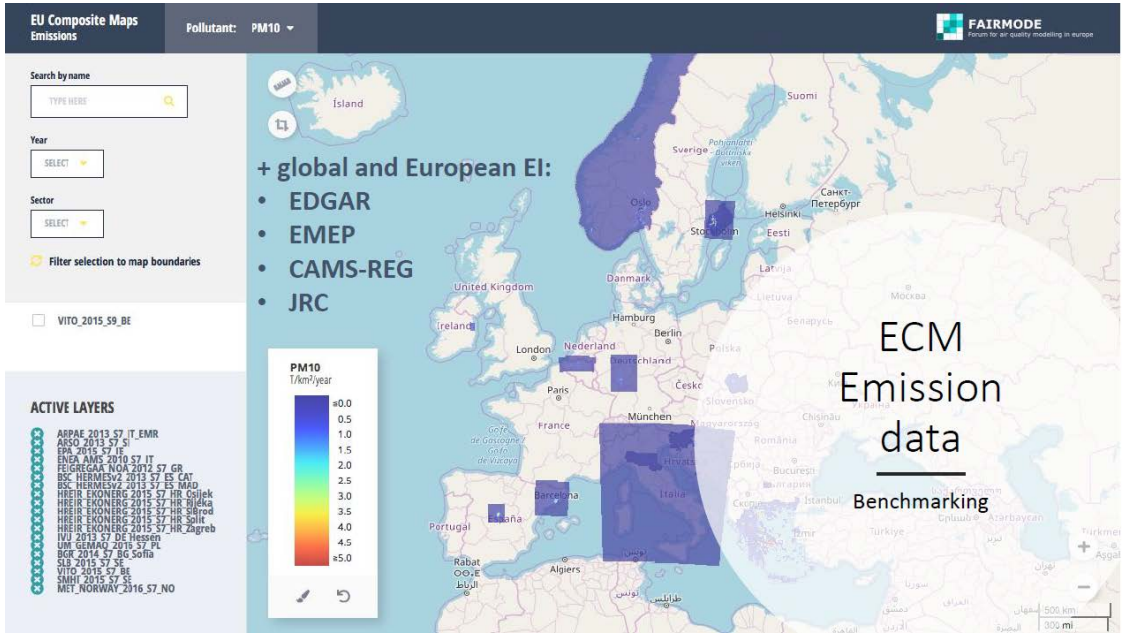


FAIRMODE Activities



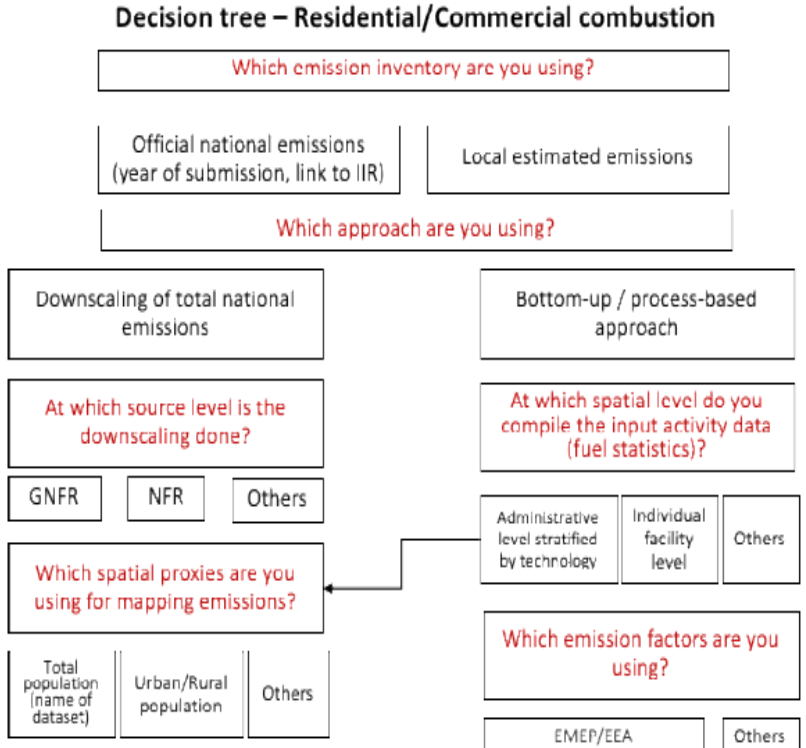
Emissions: Composite Platform

- Focus on local/urban emissions because these are not always adequately represented in national wide inventories
- Question: how to best ensure that emission data is consistent at regional and at urban level?
- Mean: composite mapping platform
- Outcome: guidance / recommendations



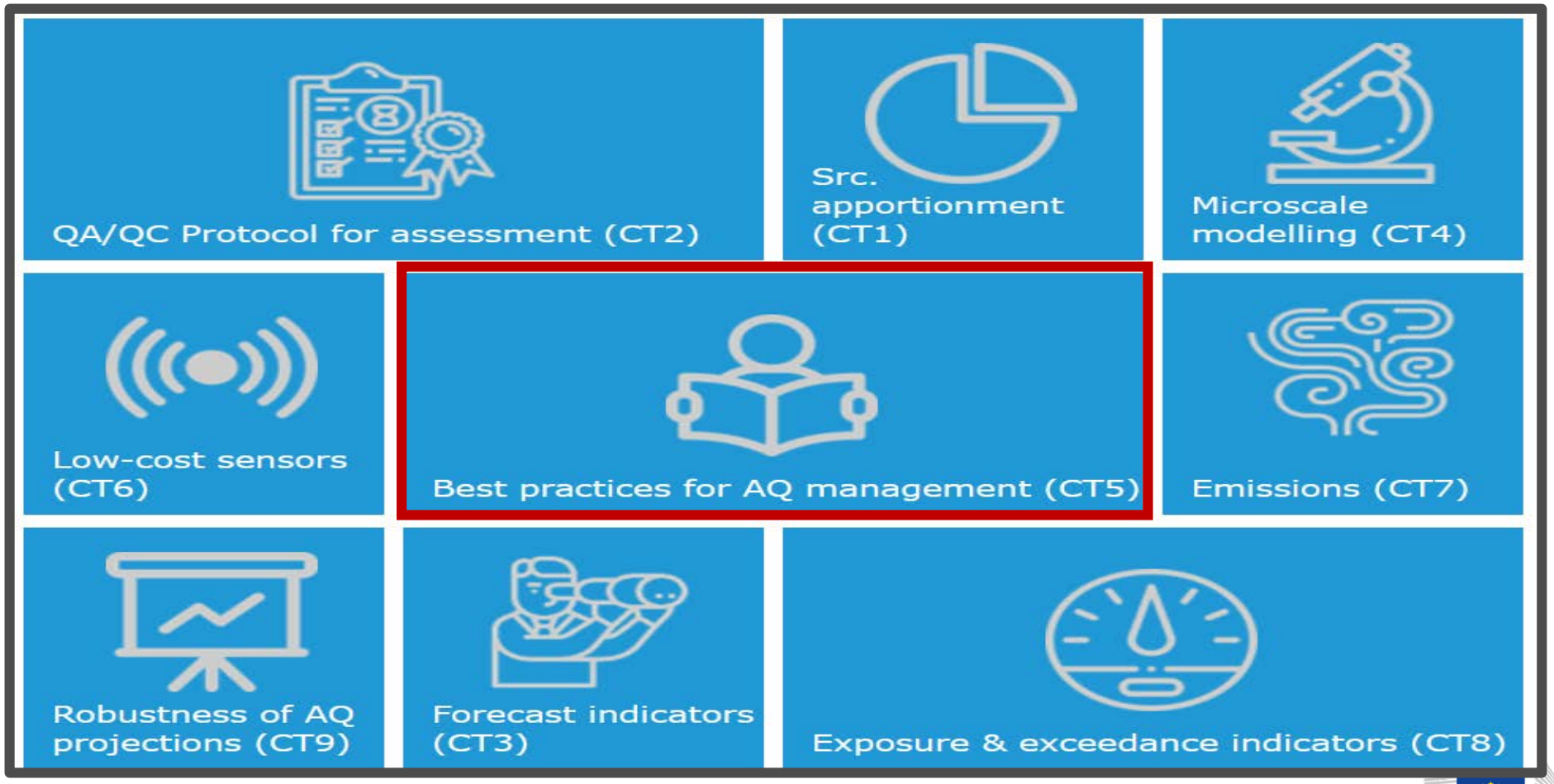
Emissions: revised metadata, decision trees

Field	Contents- Proposed revised metadata
Code	A descriptive label for the data chosen by the user
Participant	Account owner, user that is logged in to upload the maps
Affiliation	Details on the Account owner (e.g. Institute)
Emission Model Name	Name of the emission model - common to e-Reporting request
Emission Model Version	Version of the emission model - common to e-Reporting request
Year	Year of the emission data – common to e-Reporting request
Output frequency	Yearly, monthly, daily, hourly
Sector	Sector code based on the SNAP nomenclature (S1 – S10) or GNFR nomenclature (Gnfr_A – Gnfr_N)
Emission Estimation approach	Methodology used to estimate/model the emissions: "Bottom-Up", "Top-Down", Inverse Modelling
Spatial distribution approach	Methodology used to spatially distribute emissions: "Bottom-Up", Downscaling
Documentation on-line	Multiple choice at CM decision tree
Documentation	Link to publications/references
Pollutant	CO, NH_3, NMVOC, NOx, PM_{10}, $PM_{2.5}$, SO_2
Country	Name of the country selected from a drop down list
Area	In case the map refers to a part of a country: city, region, …
EPSG code	EPSG code for the map projection system



European Commission

FAIRMODE Activities



Air quality management: best practices

- Background: Need for exchanging on best practices related to air quality management at the local and regional scales (follow-up of the Pilot FAIRMODE exercise) with the aim of providing guidance.
- Outcome: guidance document organized in two parts following a harmonized template:
  - Existing knowledge
  - Key challenges
- Key challenges cover the entire path:

measures -> emissions -> concentrations -> impacts

‘Pollutant specific’ Key Challenges

- **How to implement a low emission zone, to reduce NO2 and BC**
- **How to reduce NO2 concentrations, dealing with NOx to NO2 fractions**
- **How to design measures on domestic heating, to reduce PM and BaP**
- **How to design measures to reduce O3**
- **How to implement actions to reduce PM**
- **How to act on non-exhaust traffic sources to reduce PM**

‘Horizontal’ Key Challenges

- **Best practices for exposure modelling (link to CT8)**
- **How to integrate background concentrations in a local modelling study**
- **How to design an optimal air quality plan, considering NEC requirements and co-benefits**
- **How to model the path from measures, to emissions, concentrations and health**

FAIRMODE Activities

Robustness of air quality projections

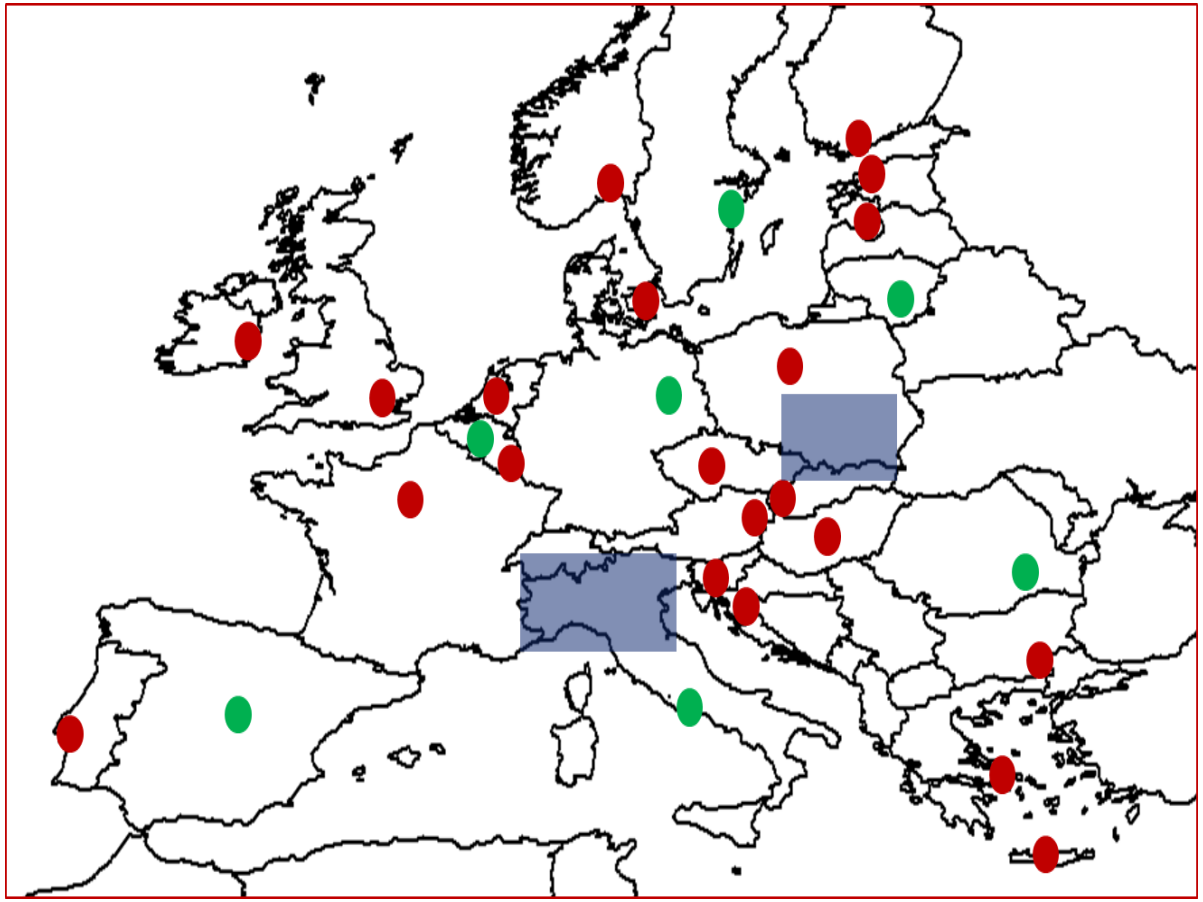
QUESTION

- How to deal with the variability of model responses to emission changes?

ANSWER

- An inter-comparison platform: to address the issue of the sensitivity of model responses to emission changes, in particular to assess, discuss, explain and possibly minimize model discrepancies.

Robustness of air quality projections



The intention is not to compare city responses among themselves but to compare model results over a given city

Goal: benchmark and understand differences among modelling system **responses to emission changes**

- Wide **set of cities in Europe** (mostly EU capitals) plus a **few regions defined**
- Main pollutants: **PM10, NO2 and O3**
- Addressing both **episodes and yearly averages**
- Theoretical scenarios (**25%, 50%)**
- Both to **local & European scale** modelling systems
- **Platform rather** than an exercise

European Commission

Thank you

European Commission