PM2.5 Atlas 2023: new findings

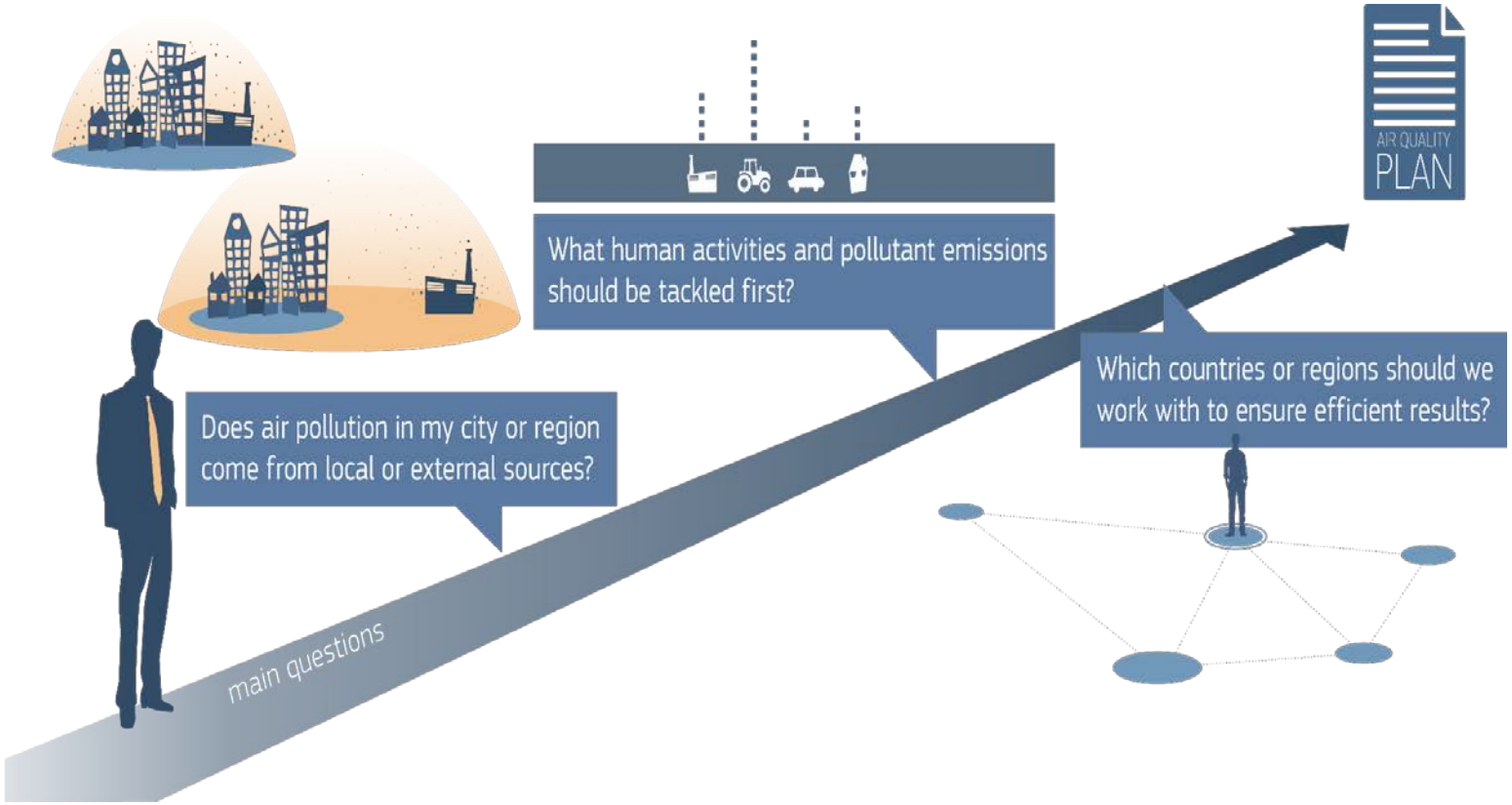
FAIRMODE updates and possible collaboration with TFIAM

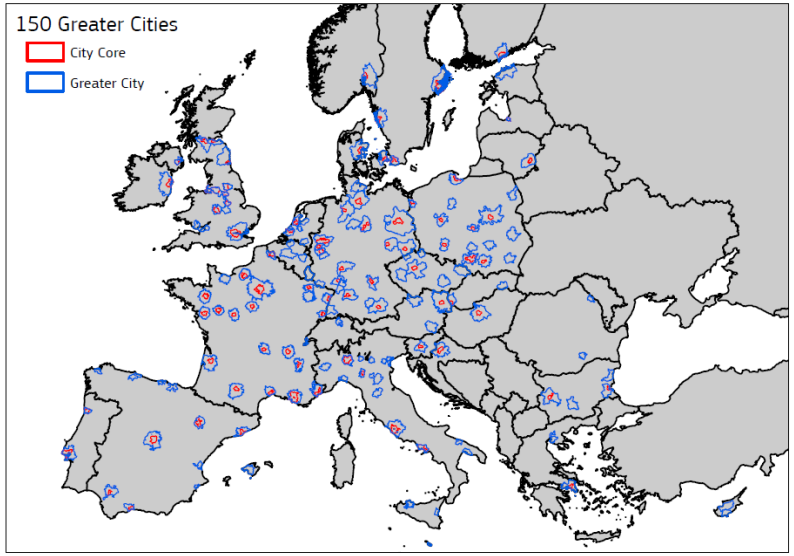
E. Pisoni, P. Thunis
JRC

PM2.5 Atlas, new findings

The JRC PM2.5 urban atlas

to help local/regional policy makers design their air quality plans





150 cities (atlas)

+

550 cities (online)

3

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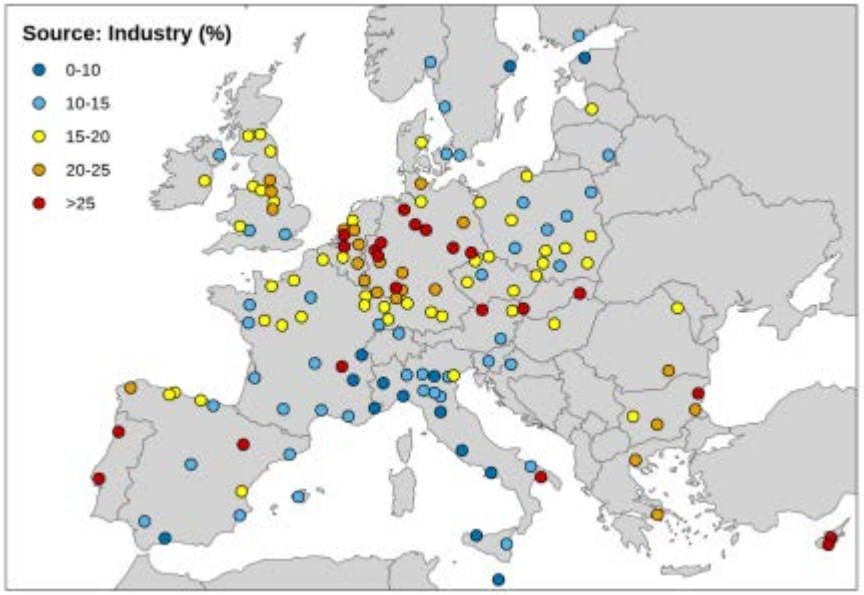
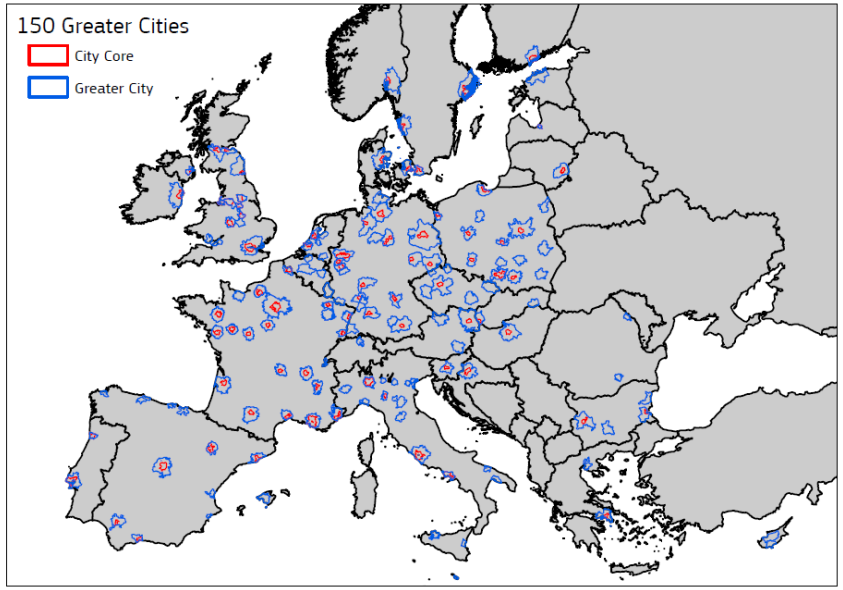
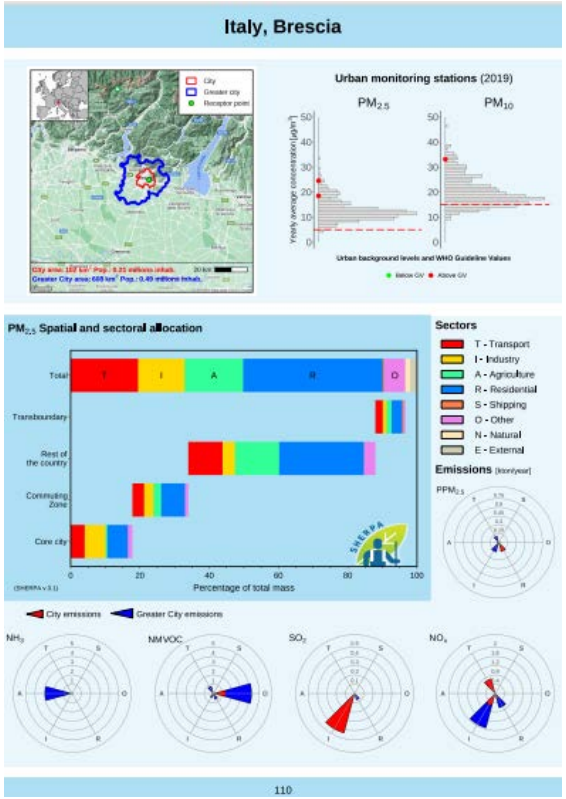
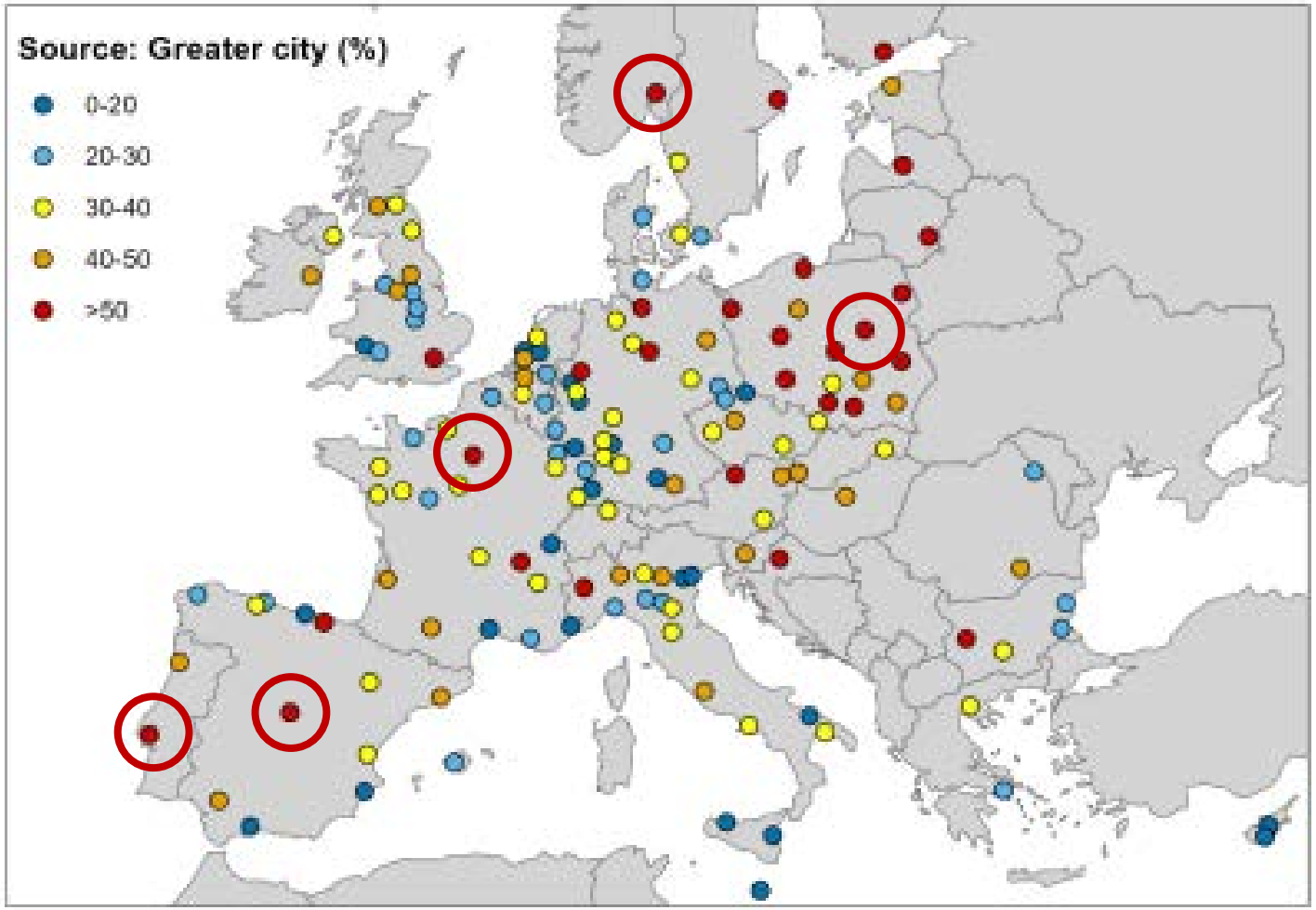
Two main visualisations







I - Local actions at the city scale are an effective means of improving air quality



In average cities (greater area) contribute to 36% of their pollution

Oslo (75%), Warszaw (72%), Lisbon(68%), Paris (65%), Madrid (63%)

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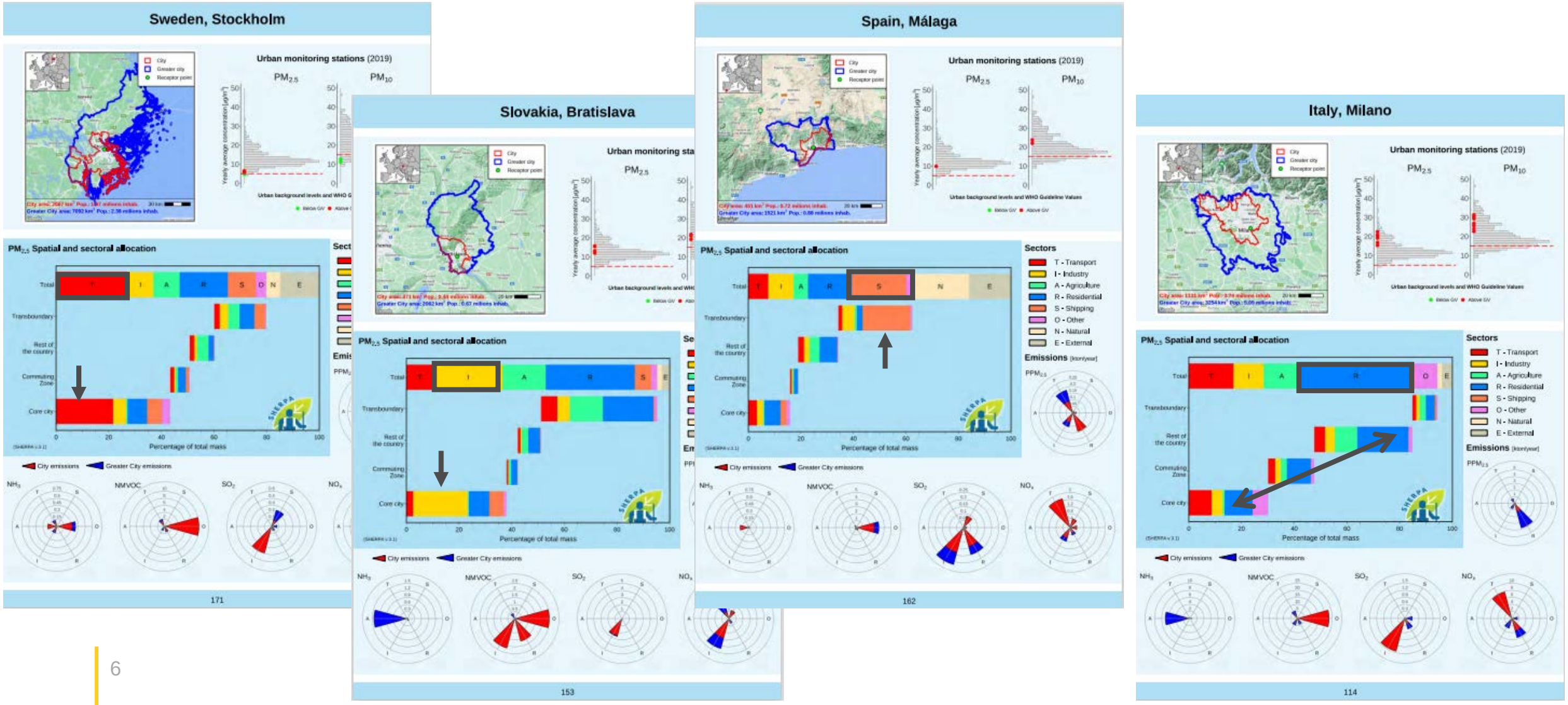
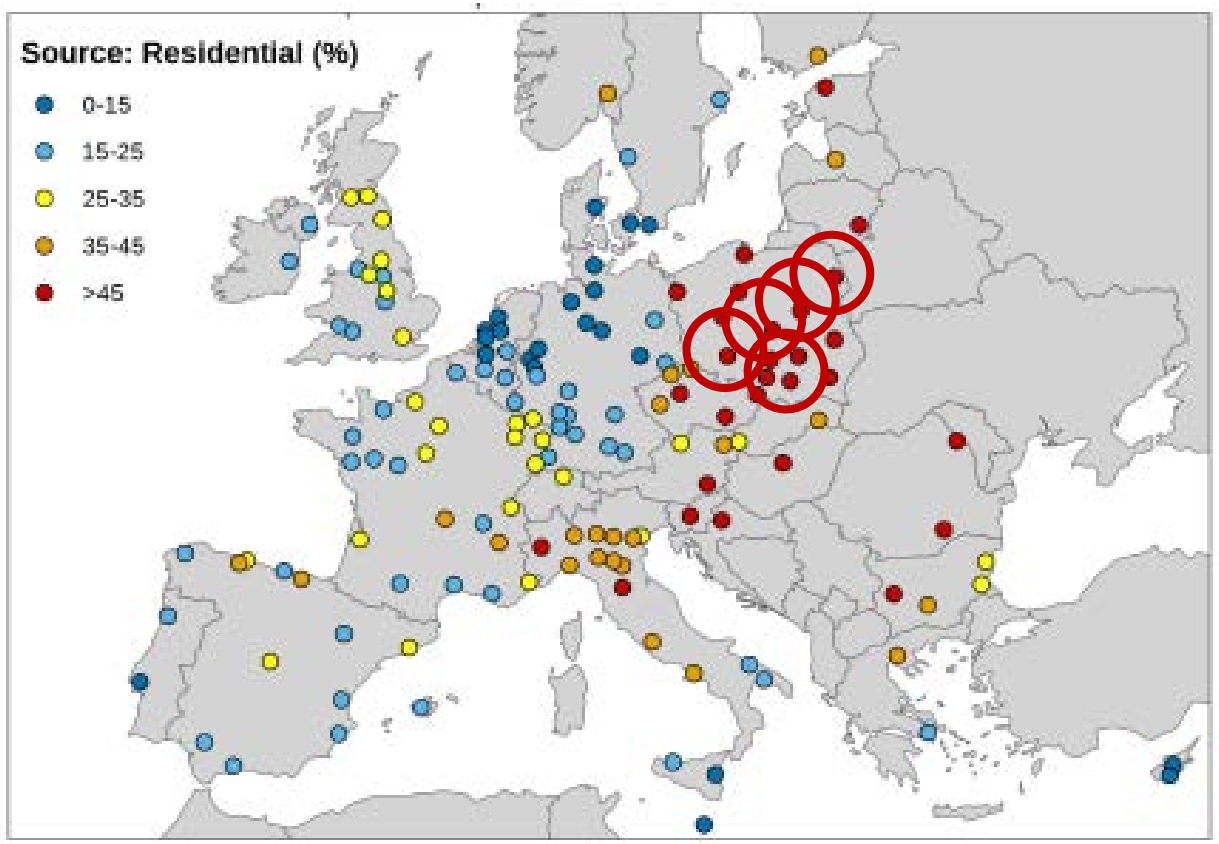
II - Target sectors and scales to abate air pollution are city specific



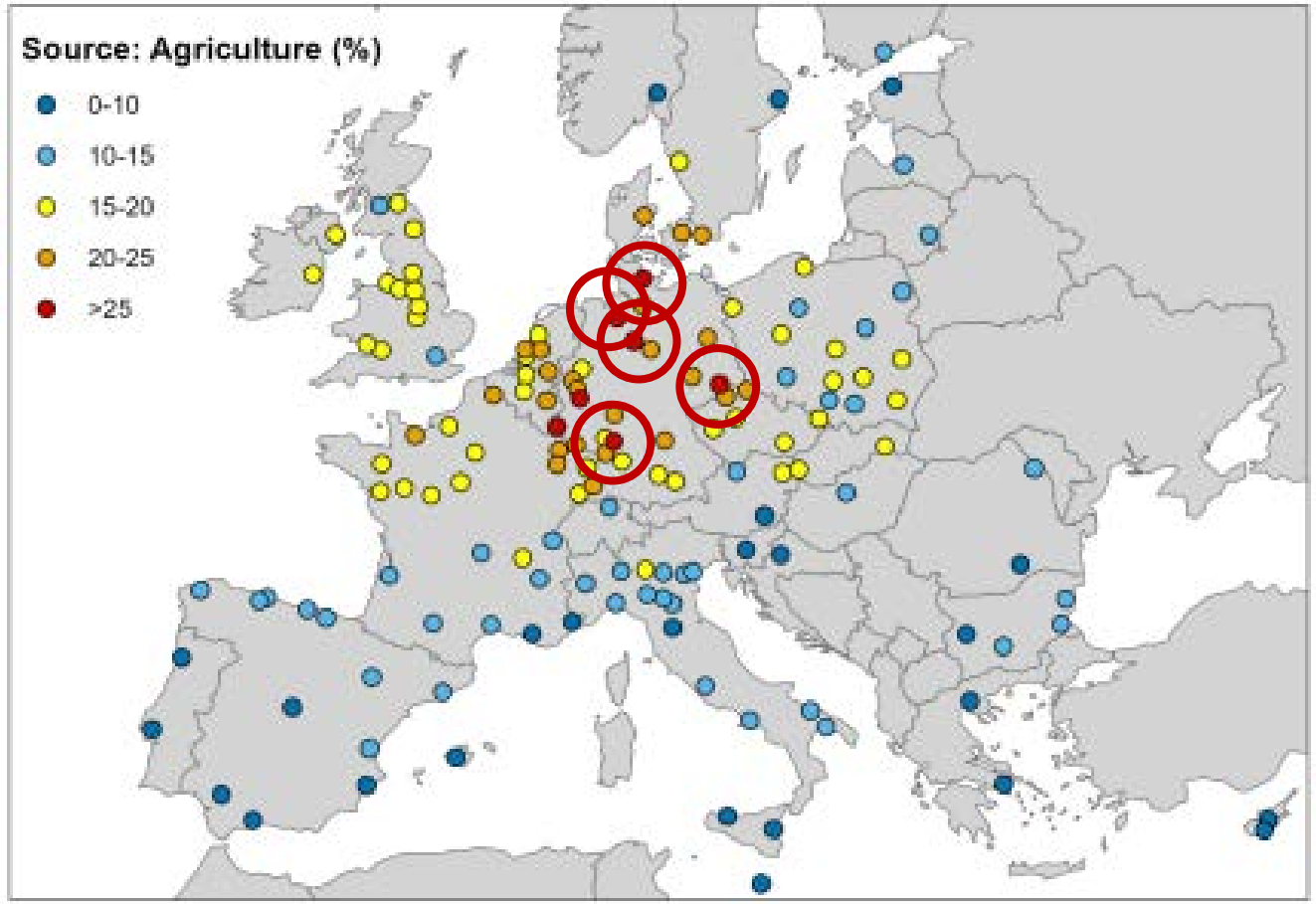
III - Measures addressing residential heating at the local level would be very effective



In average 30% of the PM2.5 pollution in cities originate from residential emissions

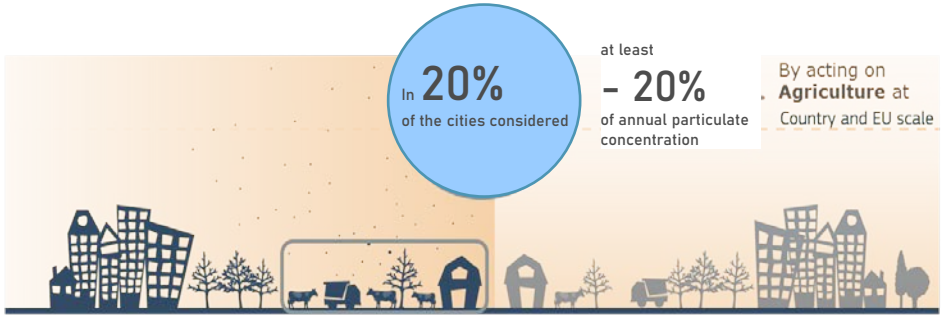
Warszaw (64%), Krakow (63%), Wroclaw (60%), Lodz (59%), Bialystok (59%)

IV - Measures addressing agriculture at country/EU scale would clearly benefit urban AQ



In average 15% of the PM2.5 pollution in cities originate from agriculture emissions

Kiel (28%), Hannover (27%), Heidelberg (27%), Dresden (27%), Bremen (26%)



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Conclusions

The Atlas 2023 main messages:

- Local actions are efficient in most cities
- Abating agriculture emissions is an efficient way to improve urban air quality
- City specificities must be considered when designing air quality plans
- Measures addressing residential heating at the local level would be very effective

https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/new-atlas-zooms-europes-city-specific-air-pollutants-sources-and-measures-take-2023-11-22_en

SHERPA online tool

https://aqm.jrc.ec.europa.eu/Section/Sherpa/Background

https://jeodpp.jrc.ec.europa.eu/eu/dashboard/voila/render/SHERPA/Sherpa.ipynb

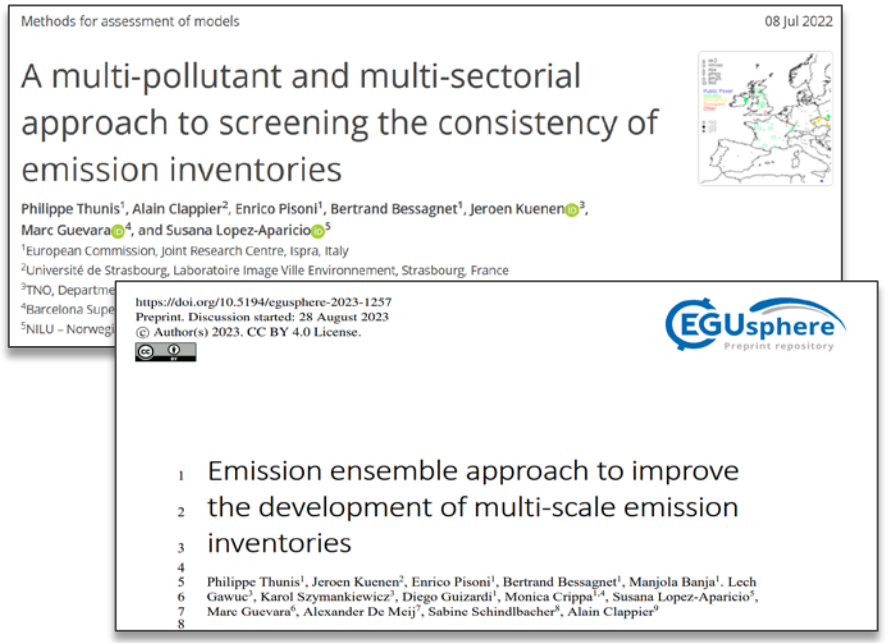
FAIRMODE updates and possible collaboration with TFIAM

Composite mapping on emissions

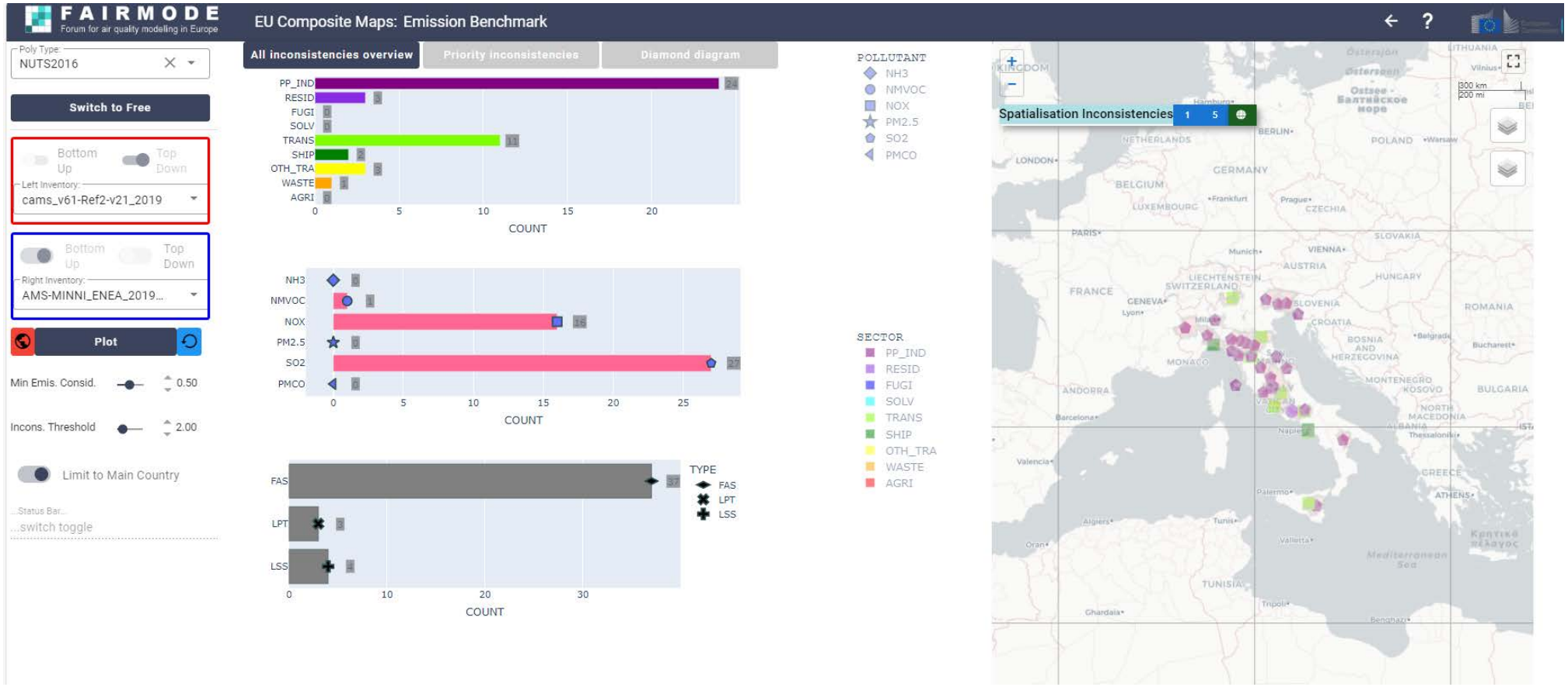
QA/QC of emission inventories is challenging because of the multiplicity of information to check: sectors * pollutants * space * time

The FAIRMODE screening approach aims at detecting inconsistencies that should then be further discussed and explained, and potentially resolved

Main principle: If two emission estimates differ largely, then one of the inventory value or both need to be checked (and maybe corrected)



Composite mapping on emissions



https://jeodpp.jrc.ec.europa.eu/eu/vaas/voila/render/FAIRMODE/emissions-dashboard/main_pageEmisEval.ipynb

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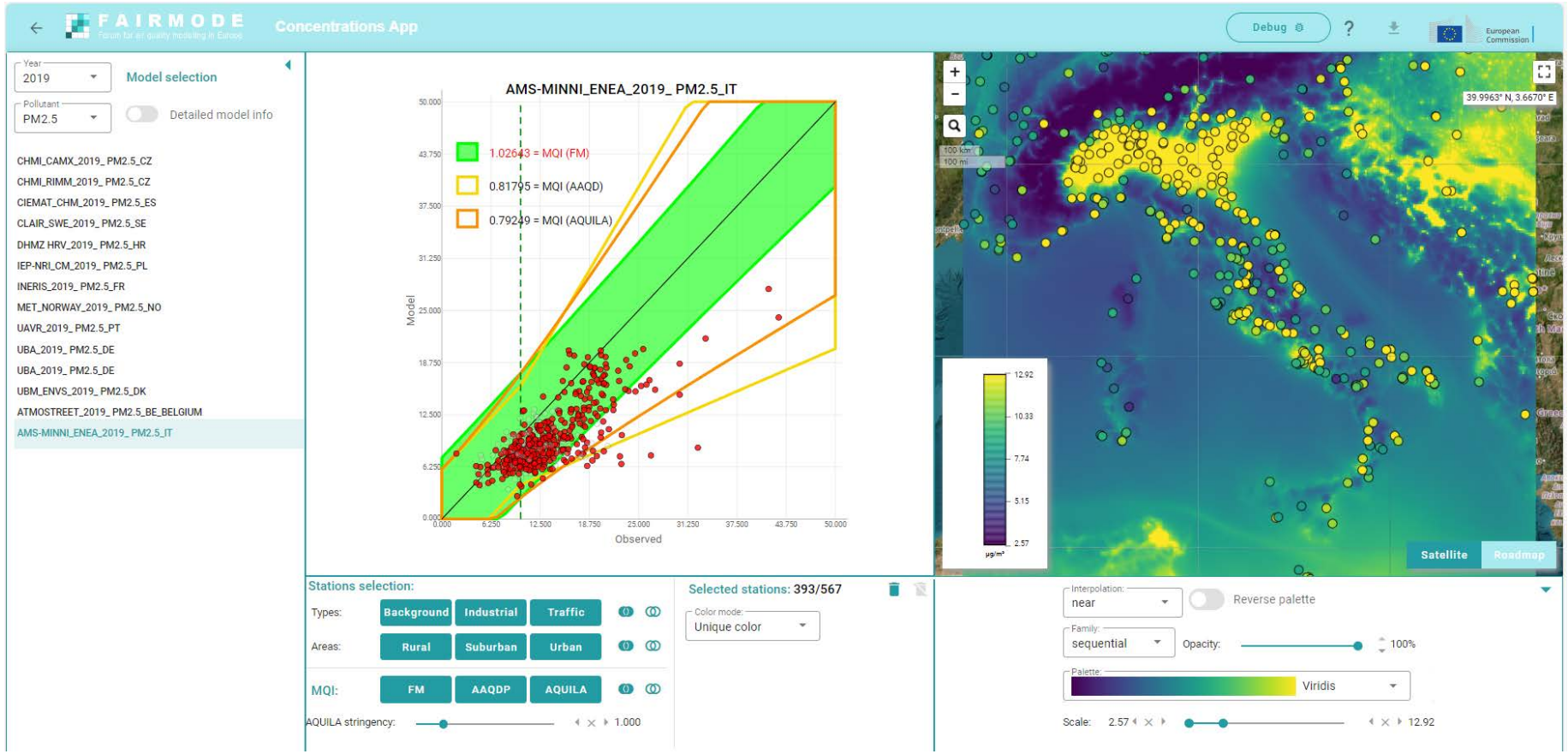
Composite mapping on concentrations



https://jeodpp.jrc.ec.europa.eu/eu/dashboard/voila/render/FAIRMODE/FAIRMODEConcentrations.ipynb

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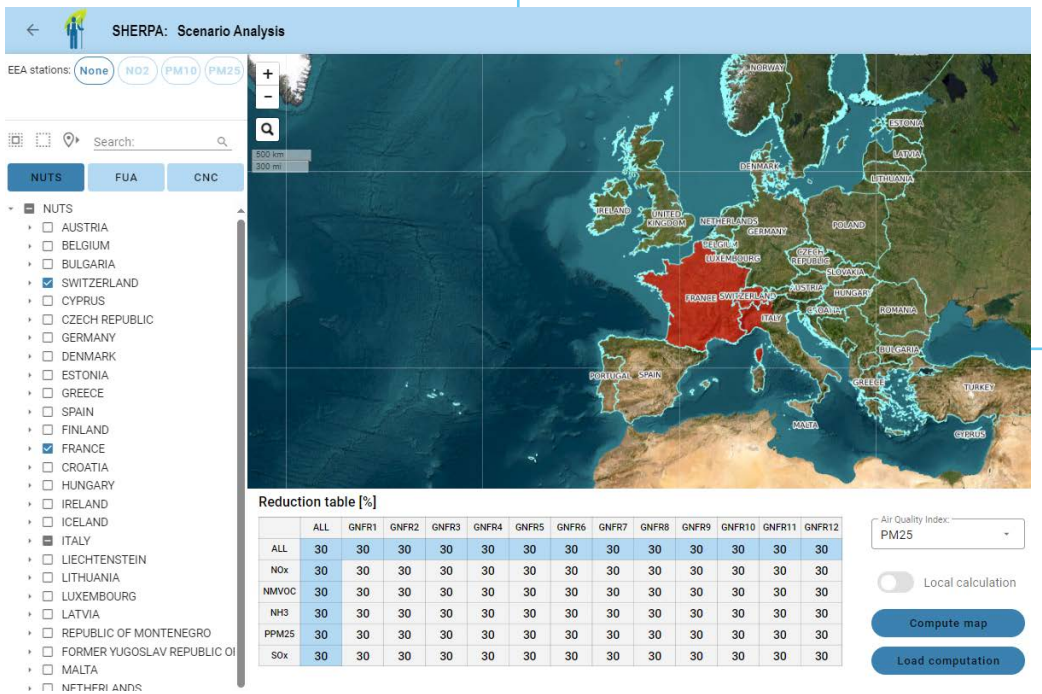
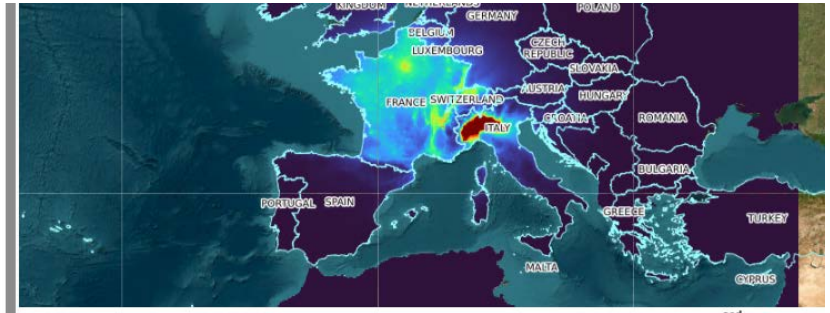
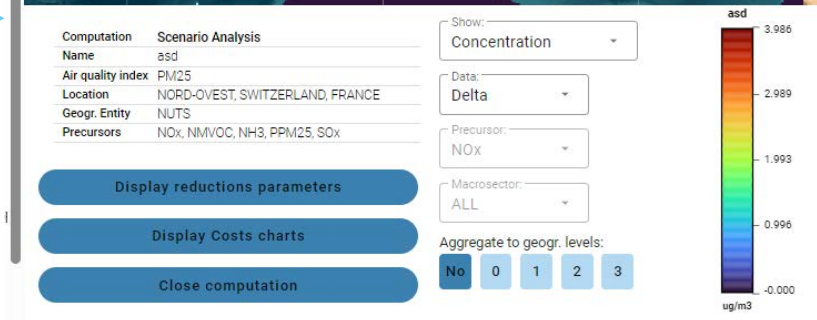
SHERPA: scenario analysis







https://jeodpp.jrc.ec.europa.eu/eu/dashboard/voila/render/SHERPA/Sherpa.ipynb

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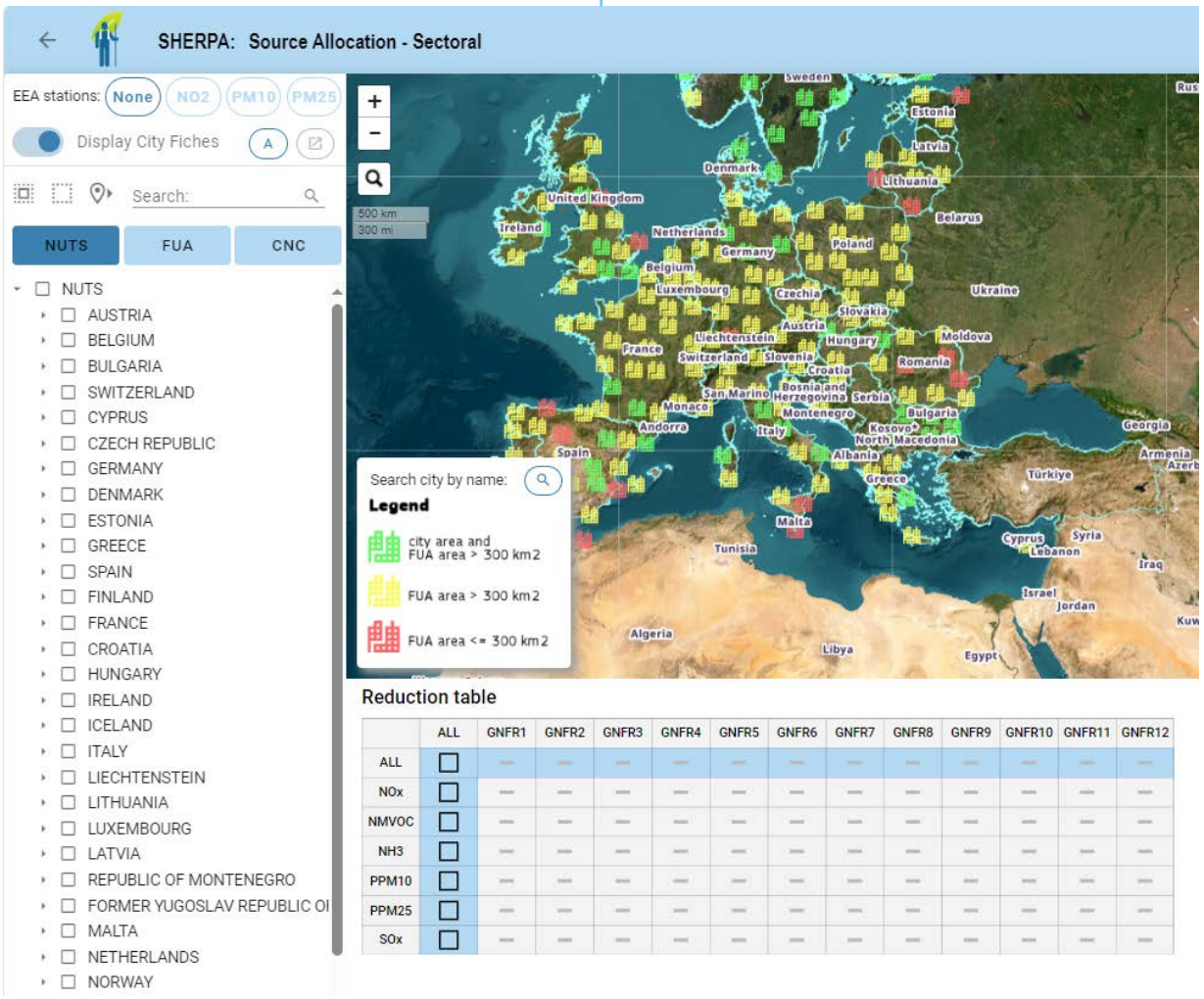
SHERPA Source allocation: default view



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‘Planning’ activities

Modelling in planning mode … priorities:

- Using ‘base-case biases‘ for planning (absolute value? % values?)
- Integrating local with larger scale air quality plans

Other actions:

- Checklist for reporting air quality measures – to improve reporting
- The AQ database of measures: we are looking for an alternative version of it

Conclusions

PM2.5 Atlas confirms the main messages of the previous 2017 and 2021 versions:

- Local action is relevant but city specific
- Sector and pollutants to target are city-specific
- Residential heating and agriculture are confirmed as important contributors to urban pollution

Possible tasks for collaboration:

- For benchmarking: emissions and concentrations dashboards are open to new deliveries!
- For planning: the cloud-version of SHERPA is now available
- For planning: Fairmode will now focus its work on the use of bias correction

Thank you

EU Science Hub
joint-research-centre.ec.europa.eu

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