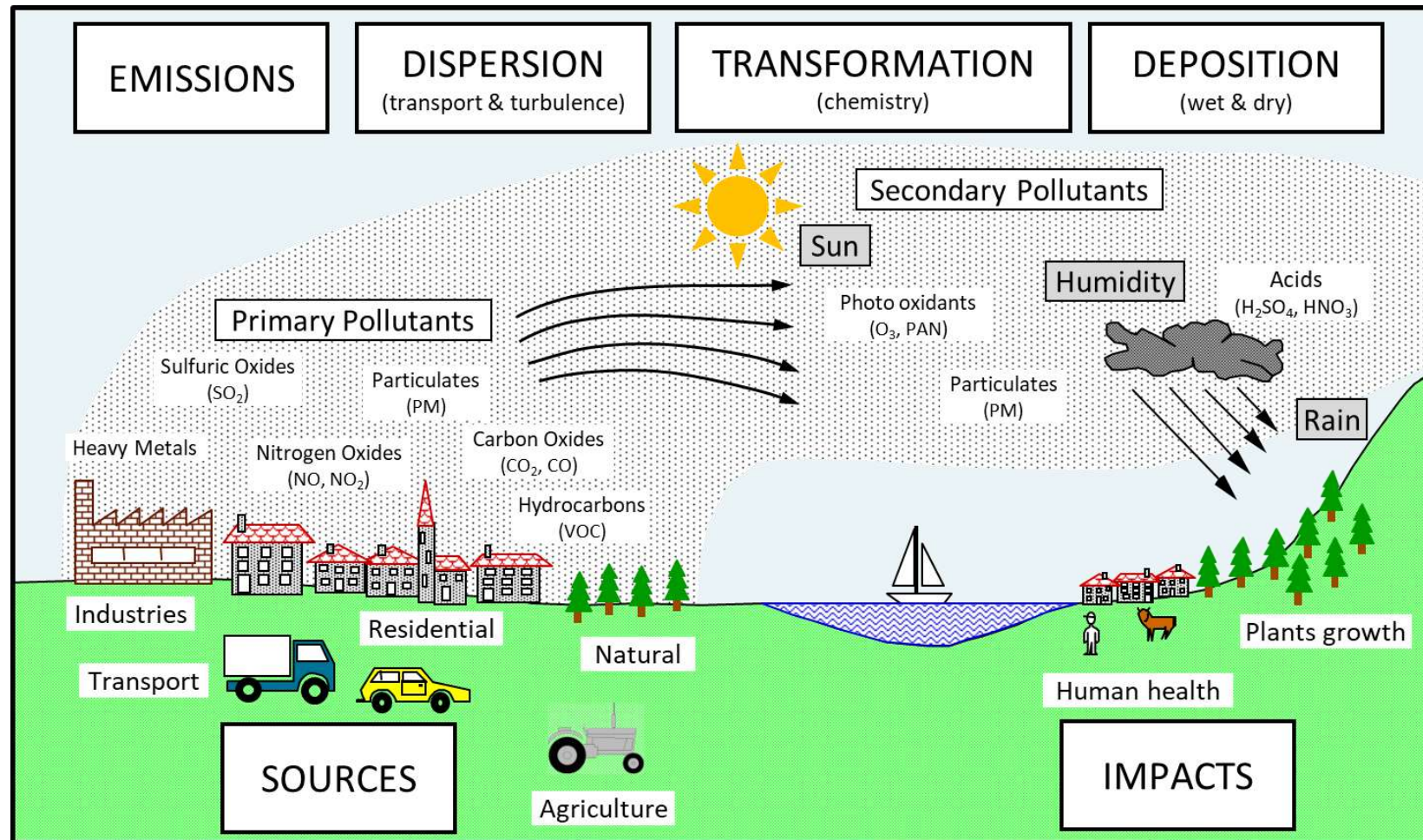


SHERPA

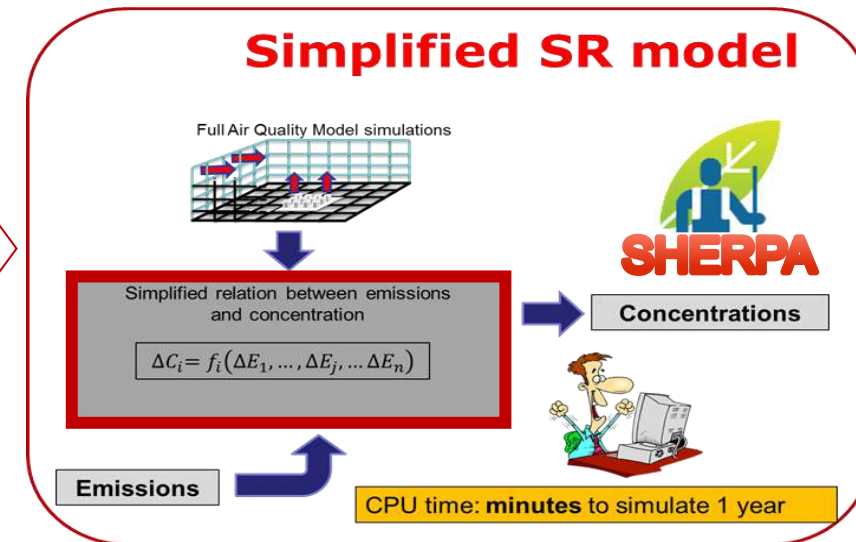
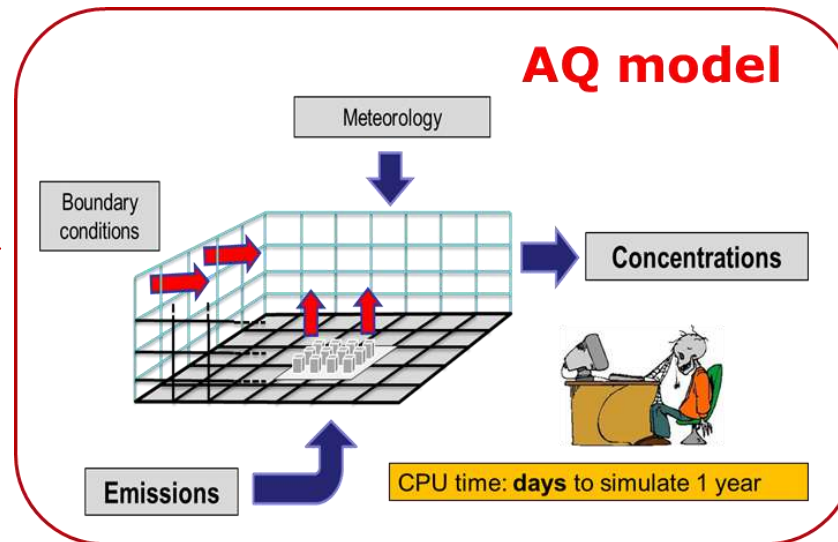
A tool for cost / benefit analysis of AQ policies



Relation between Sources (Emissions) and Receptor (Impacts)



SHERPA a Source/Receptor Model



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Research article

On the design and assessment of regional air quality plans: The SHERPA approach

P. Thunis ^{a,*}, B. Degraeuwe ^a, E. Pisoni ^a, F. Ferrari ^b, A. Clappier ^c

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^b TerrAria srl, Via M. Giotto 132 20125 Milan, Italy

^c Université de Strasbourg, Laboratoire Image Ville Environnement, Strasbourg, France

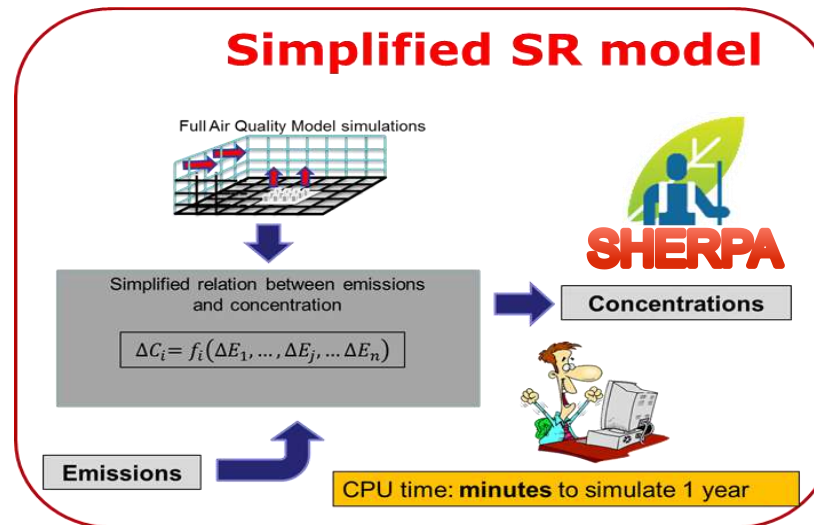
SHERPA: Input and Output

INPUT

Simulations of a **series of scenarios** with an air quality model:
1 base case,
10 reduction for training,
5 for validation.

INPUT

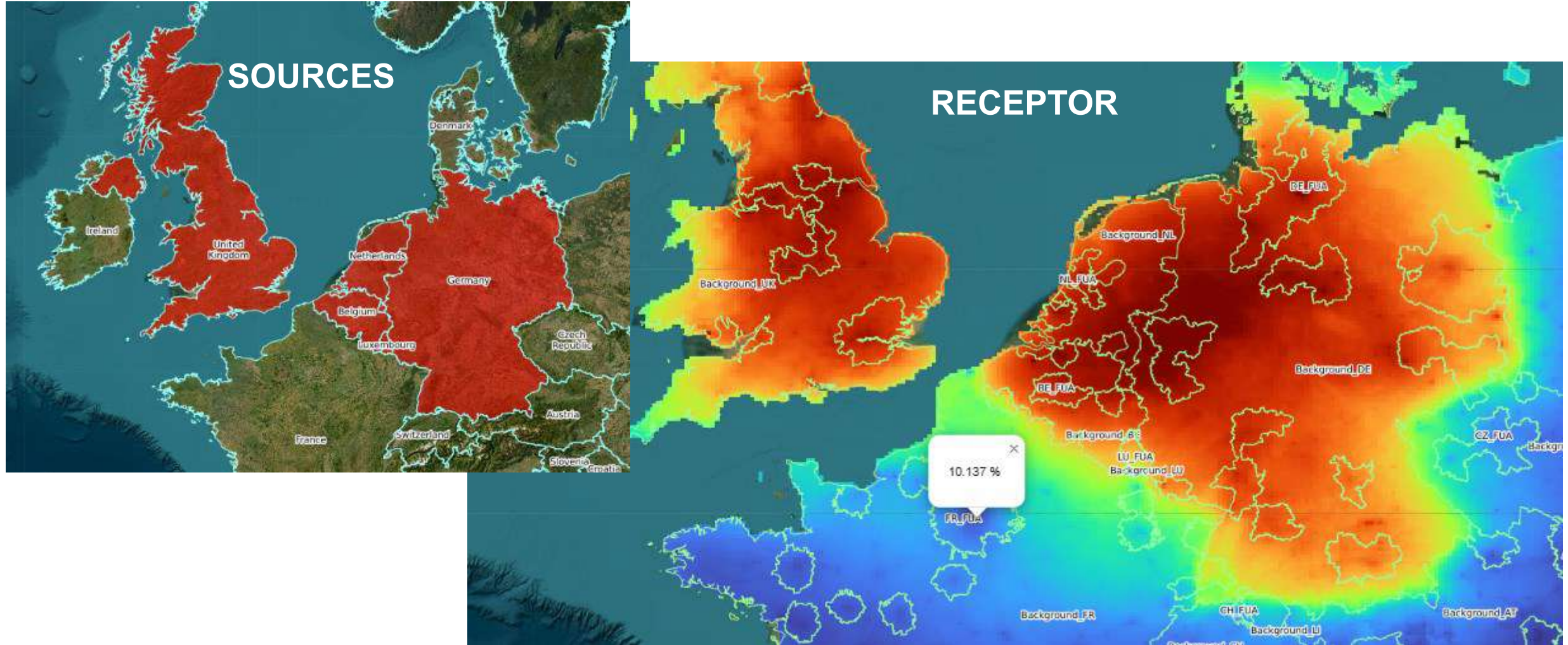
Emission inventories of
precursor compounds
disaggregated by activity sector.



OUTPUT

Concentration reductions:
per activity sector
per areas

Impact of trans-boundary pollution

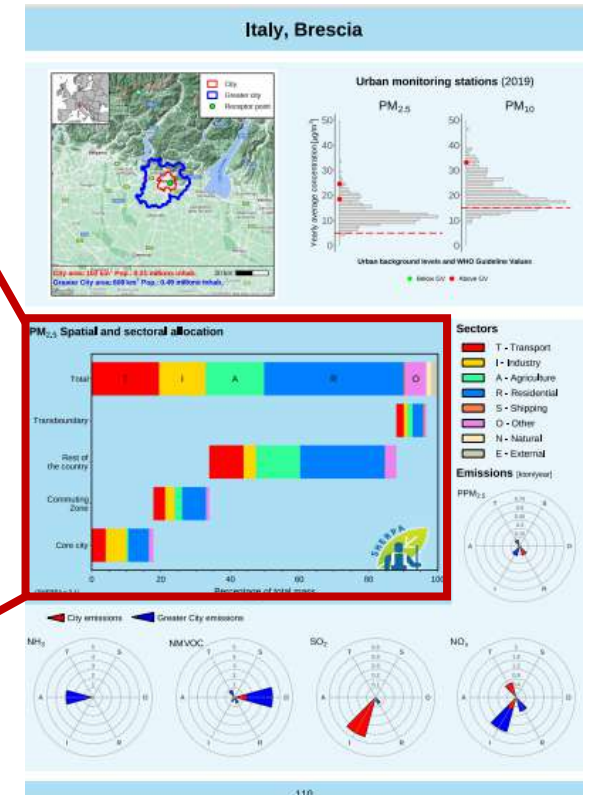
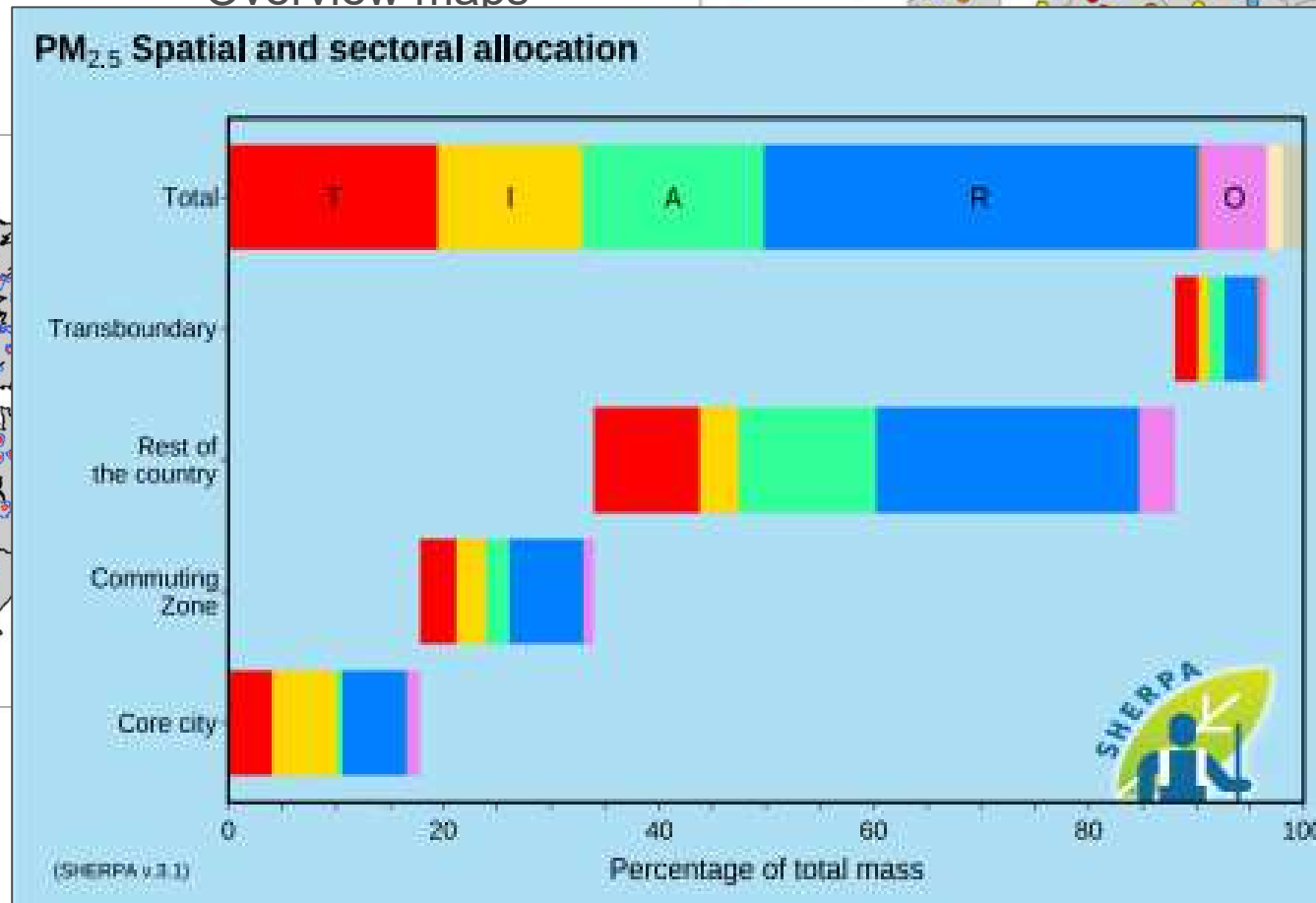
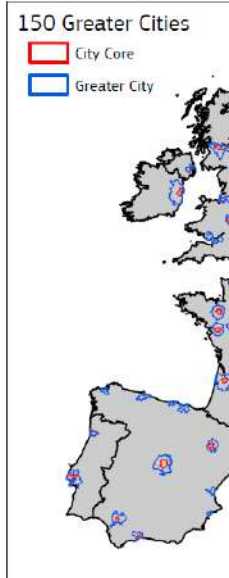
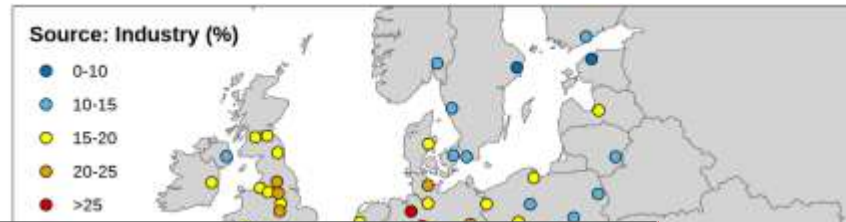


Impact of Reductions



<https://publications.jrc.ec.europa.eu/repository/handle/JRC134950>

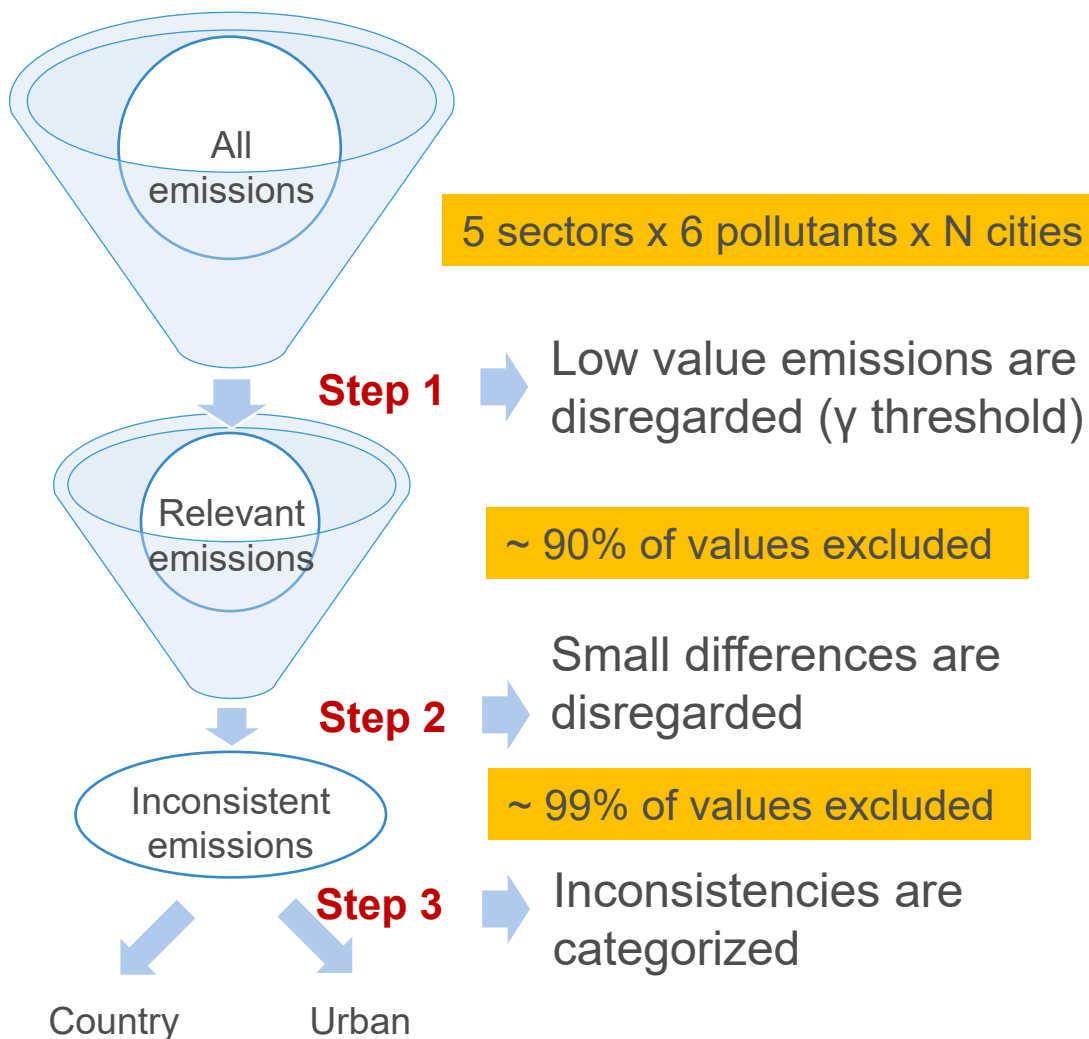
Overview maps



Emissions

Screening of emission inventories

Comparing 2 emission inventories



1. **Country Pollutant Totals**
2. **Country Sectorial share**
3. **Urban share**

Only aggregated emissions data necessary!

A multi-pollutant and multi-sectorial approach to screening the consistency of emission inventories



Philippe Thunis¹, Alain Clappier², Enrico Pisoni¹, Bertrand Bessagnet¹, Jeroen Kuenen³, Marc Guevara⁴, and Susana Lopez-Aparicio⁵

¹European Commission, Joint Research Centre, Ispra, Italy

²Université de Strasbourg, Laboratoire Image Ville Environnement, Strasbourg, France

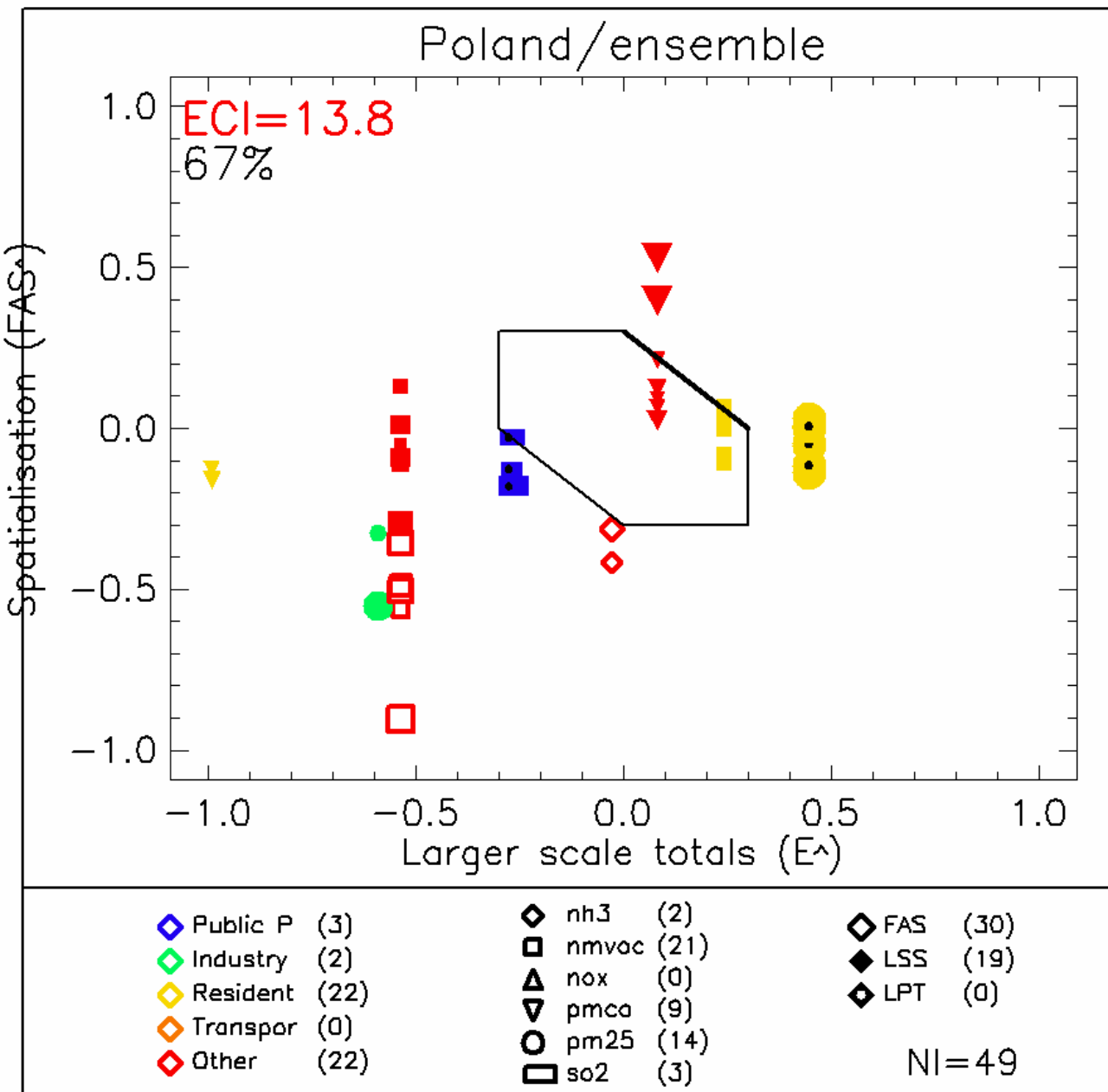
³TNO, Department of Air, Climate and Sustainability, Utrecht, the Netherlands

⁴Barcelona Supercomputing Center, Barcelona, Spain

⁵NILU - Norwegian Institute for Air Research, 2027 Kjeller, Norway

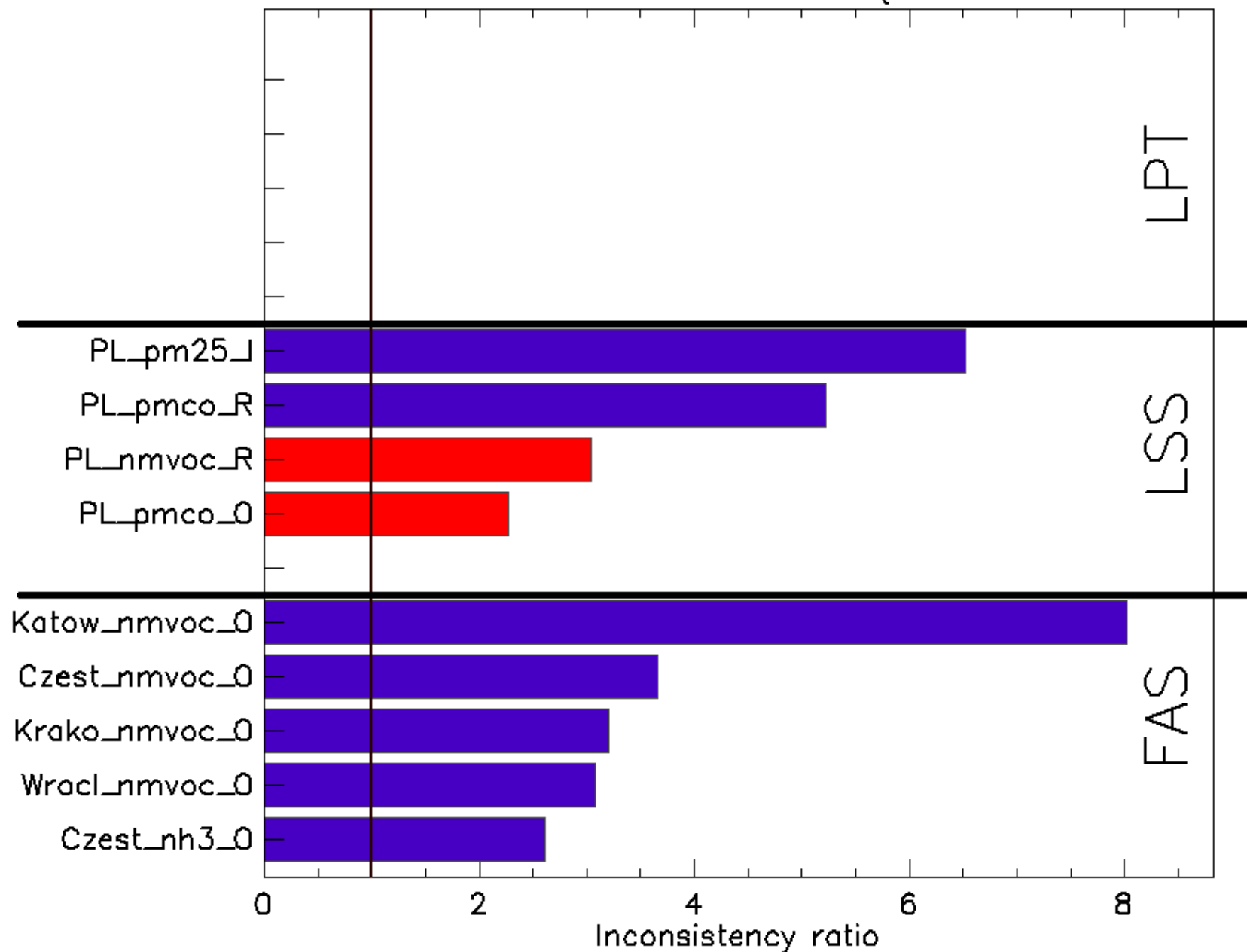
Comparison of the Polish inventory with a EU-wide inventory

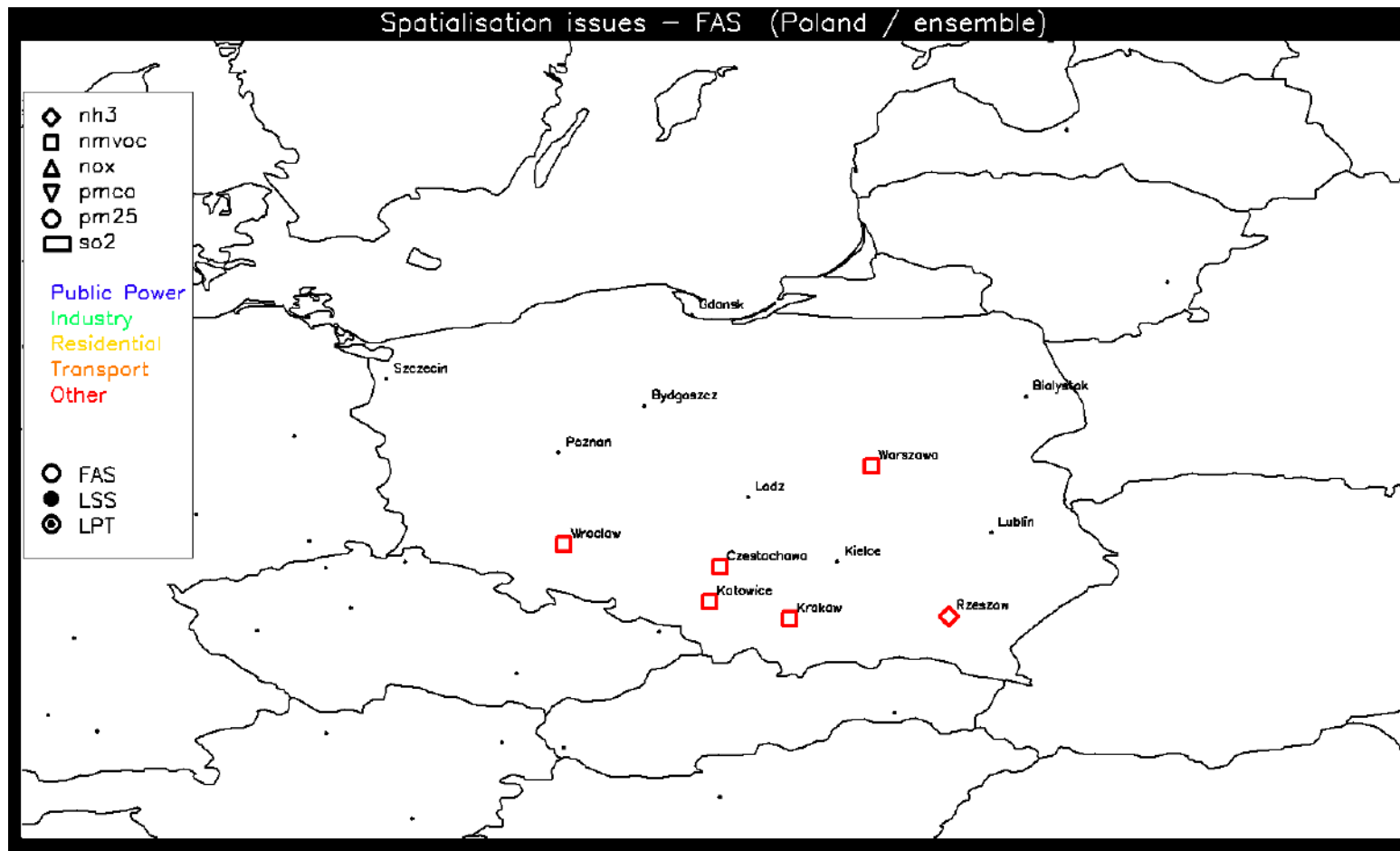
- Applied to 14 cities in Poland, 5 sectors and 6 pollutants, leading to 420 emission ratios being tested
- Among the 420 available data, 73 remain after the relevance test and 49 after the inconsistency test ($\beta > 2$). Inconsistencies occur for about 67% of the relevant points



- Sectors: most issues point to the residential and other sectors
- Pollutants: NMVOC and PM2.5
- Scale: country sectorial share and spatialization
- E.g. PM residential emissions are systematically larger in the national inventory (inclusion of condensable emissions).

Main LPT-LSS-FAS inconsistencies (Poland vs ensemble)





At the local scale, the spatial allocation of NMVOC emissions for the other sector leads to important differences in some cities. These large differences are likely caused by emissions from heaps and excavations. While in these emissions are included in the national version, this is not the case in EU wide inventories. Hence, including all heap and excavations emissions in EU-wide inventories would be advisable.

Design of an integrated air quality management system for South America

Building regional tools for policy and action

CASAP 2025

Towards an urban IAM tool in Colombia /S. America to support AQ policies

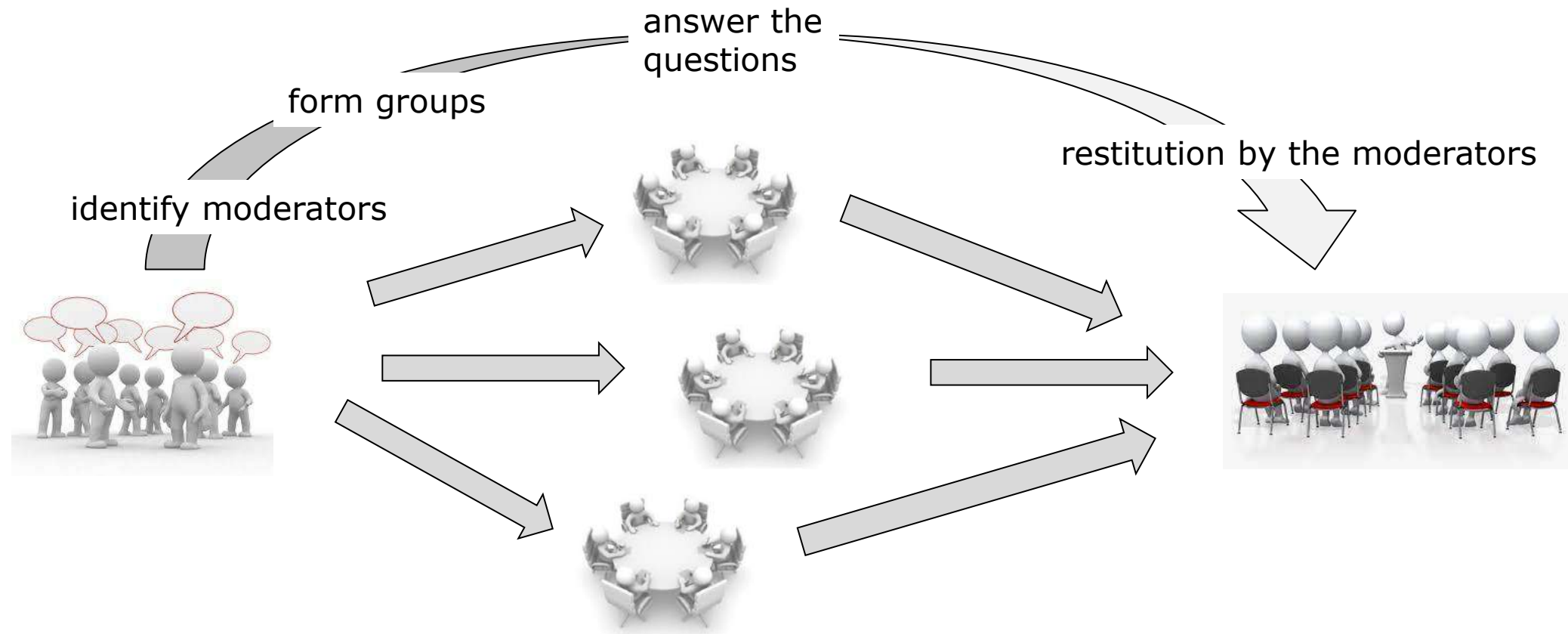


Co-designing a Latin-America initiative for integrated air quality management: Building regional tools for policy and action

Location room 4

Time: Thursday 17:00-18:30

Goal: Answer to 5 questions



Q1: Spatial scope: continental – regional – national?

A. Continental



B. Regional



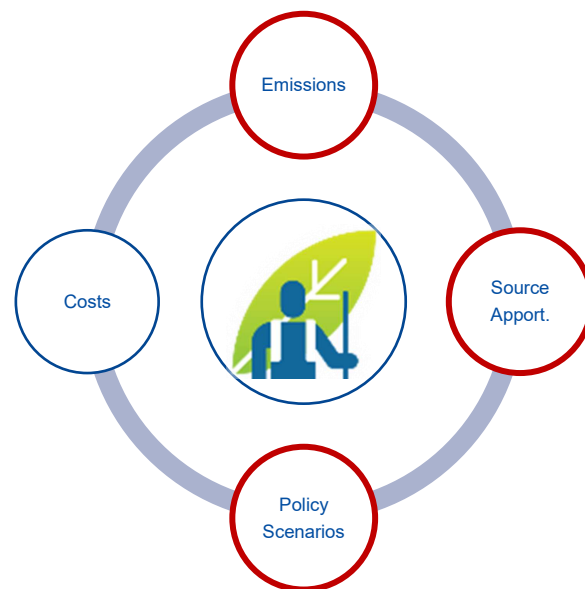
C. National



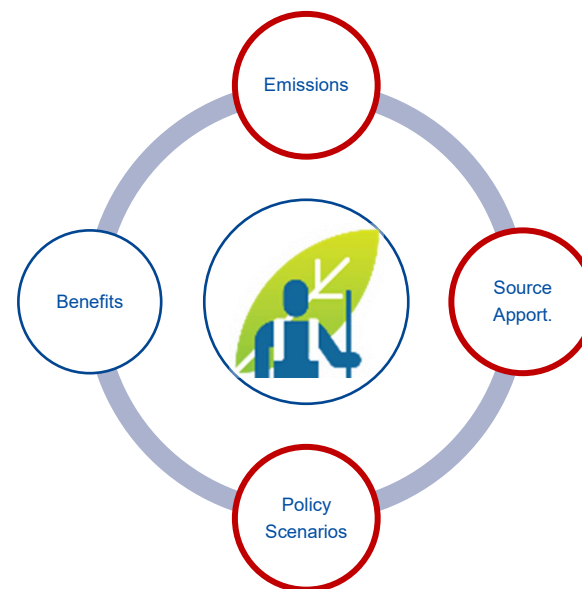
Q2: Thematic scope ?



A. Full



B. Inter - Costs

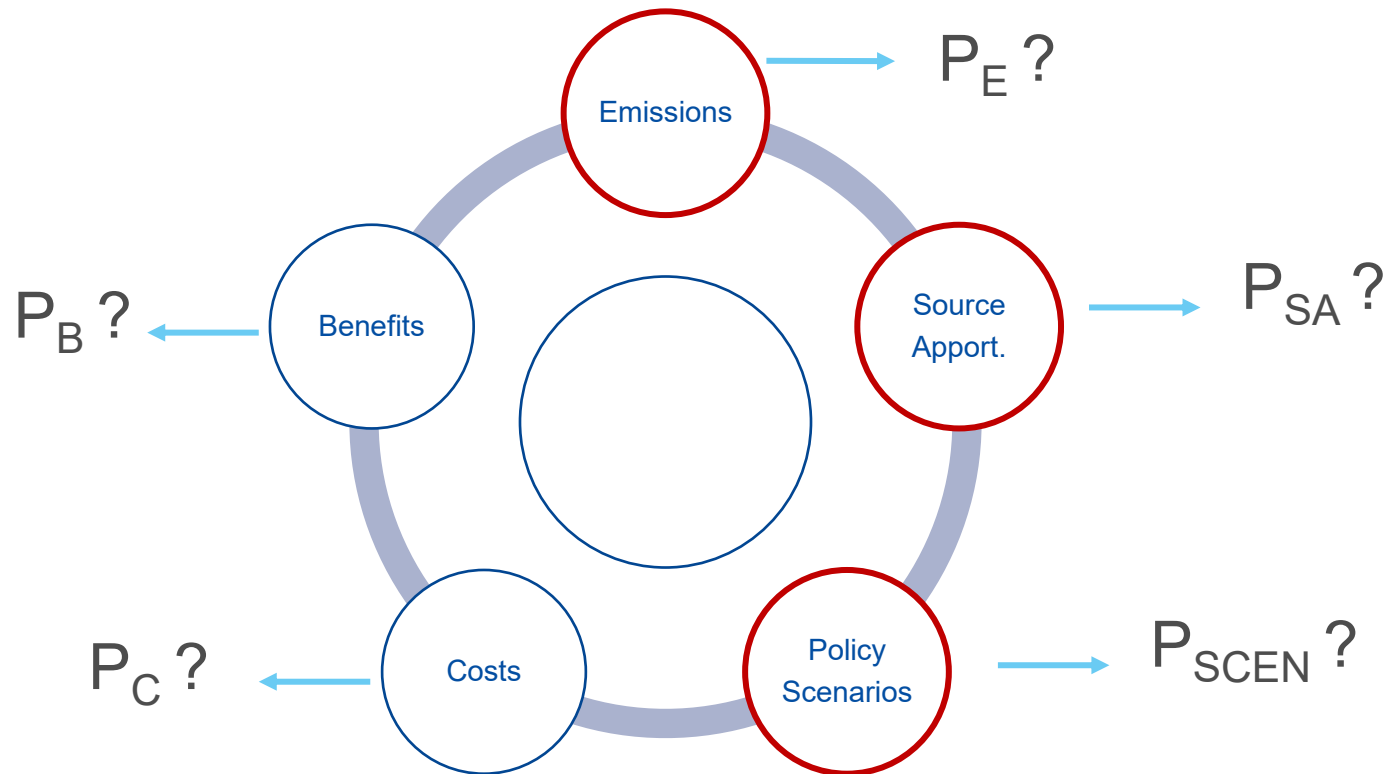


C. Inter - Benefits



D. Essential

Q3: Potential partners



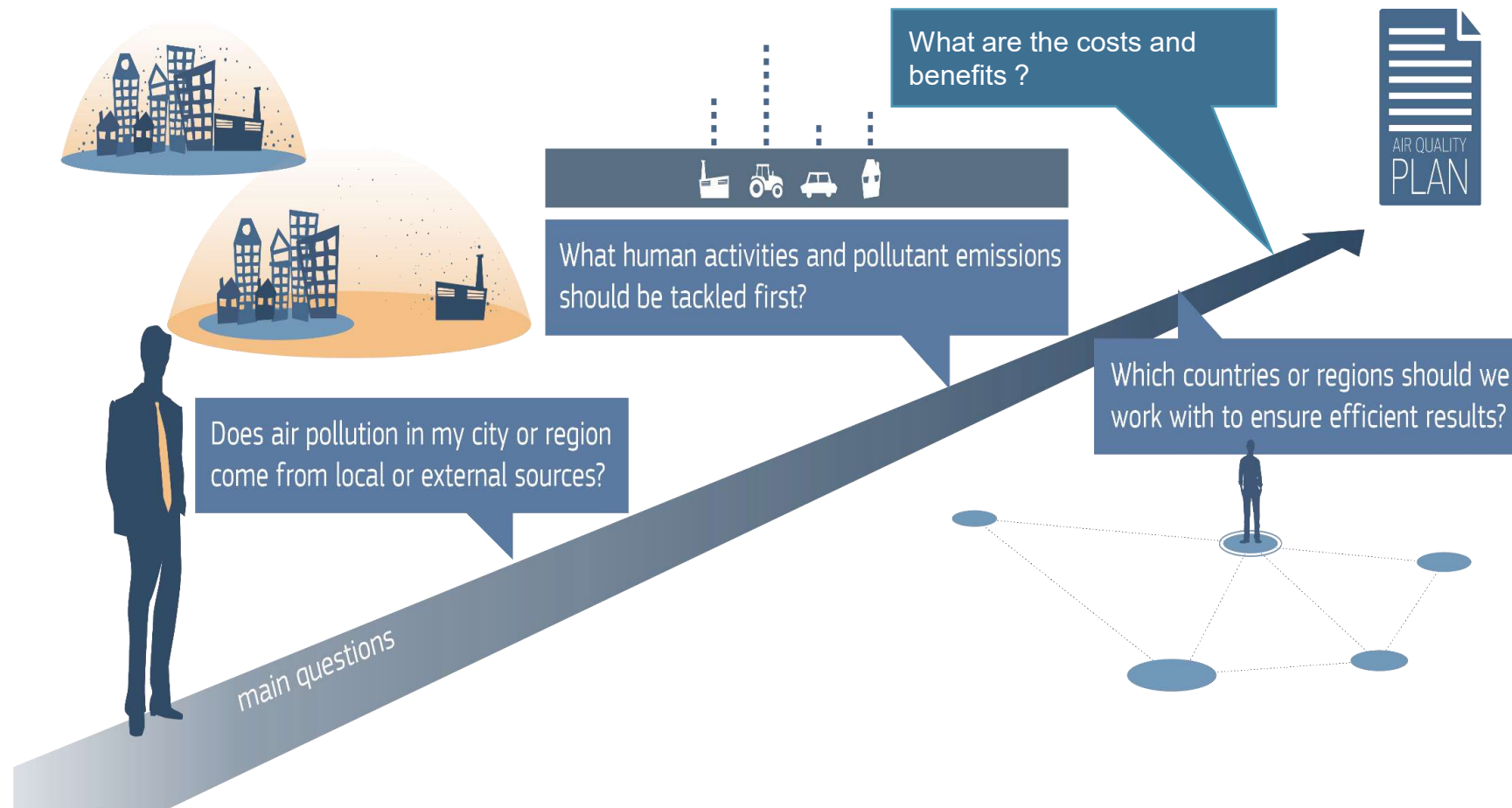
Q4 – Needs ?

- What are the needs (staff, equipment, travel...)

Q5 – Funding options ?

- What are the funding options (World bank, Colciencias ...)

SHERPA: A tool to support the design of air quality plans



Scenario Analysis



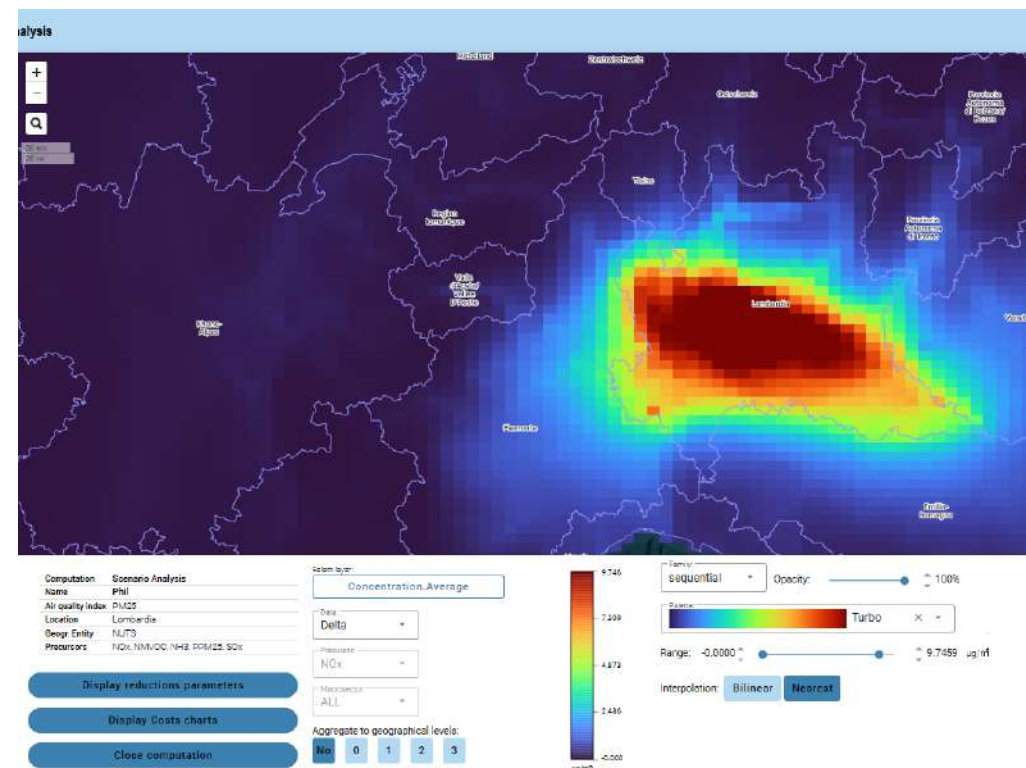
What is the impact of a given set of emission reduction on concentration / exposure?



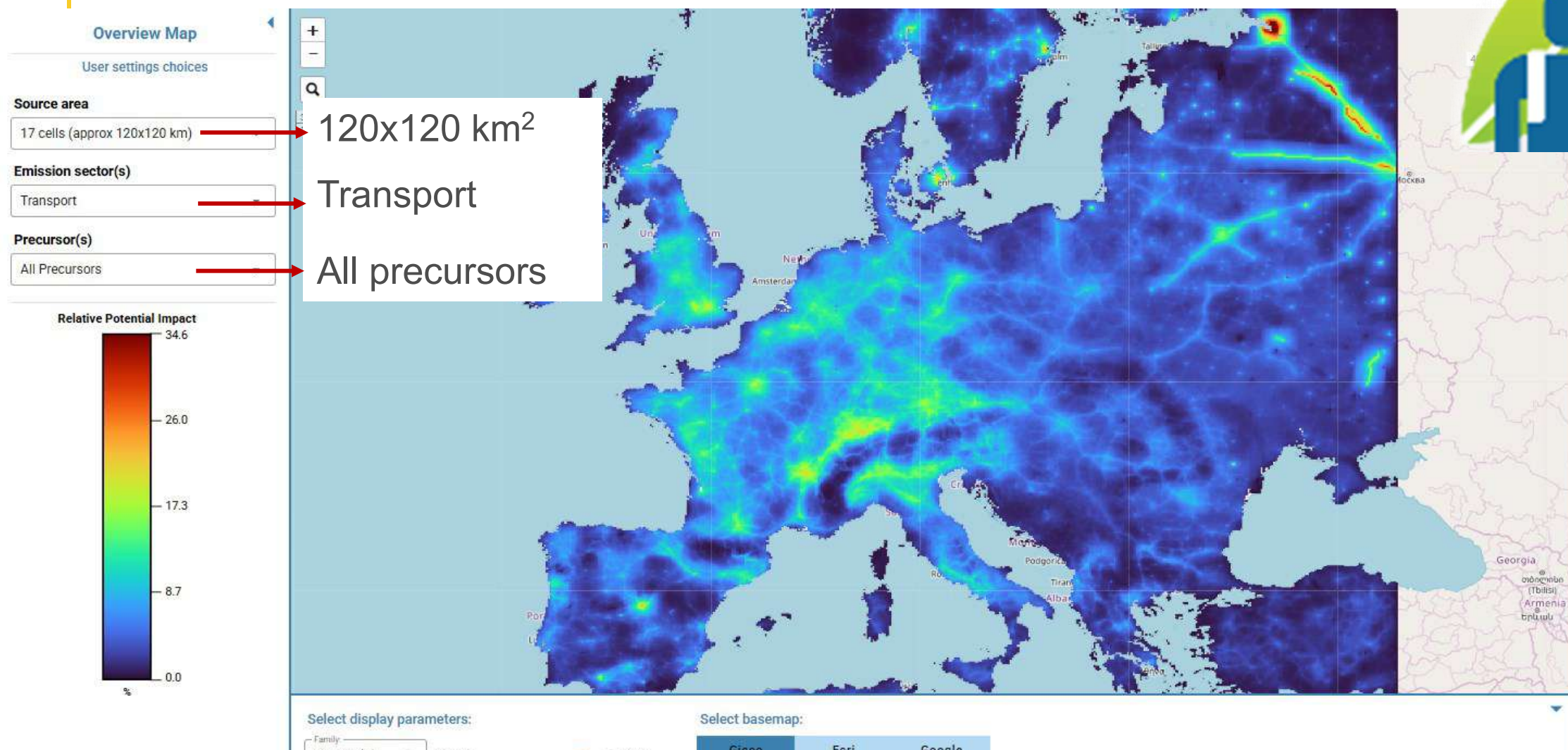
- ❖ Source area (NUTS, FUA, CNC)
- ❖ Emission reduction strategy (precursors, sectors)
- ❖ Pollutant (NO₂, PM_{2.5}, PM₁₀)



- ❖ Gridded concentrations (and deltas)
- ❖ Gridded population exposure (and deltas)
- ❖ Gridded health benefits (and delta)
- ❖ Gridded technical costs (based on BAT)



Interactive source apportionment maps



Note: Each EU map requires about 400 000 SHERPA simulations
The interface provides access to 270 maps