European

SHERPA

A tool to support the design of regional air quality plans

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SHERPA
Screening for High Emission Reduction Potential on Air

European Commission
Joint Research Centre

Software developed by TerrAria under the Contract Procedure no. JRC/IPR/2014/H.2/0023/NC

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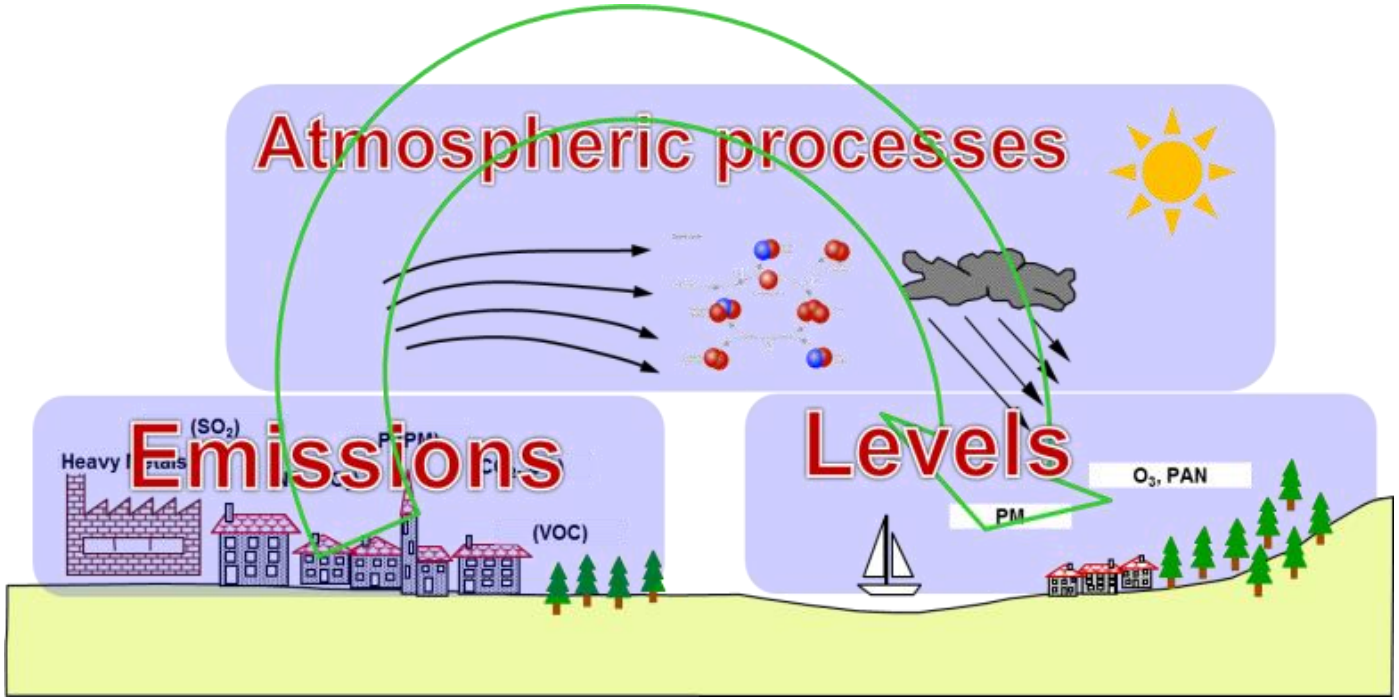
JRC Approach

European Commission



SHERPA: flexible, fast and accurate screening of the emission – concentration links

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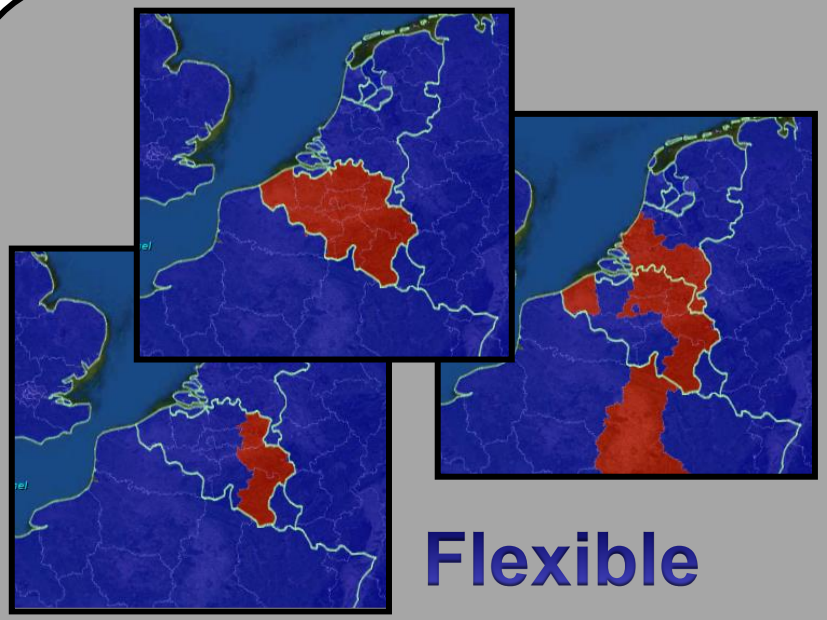
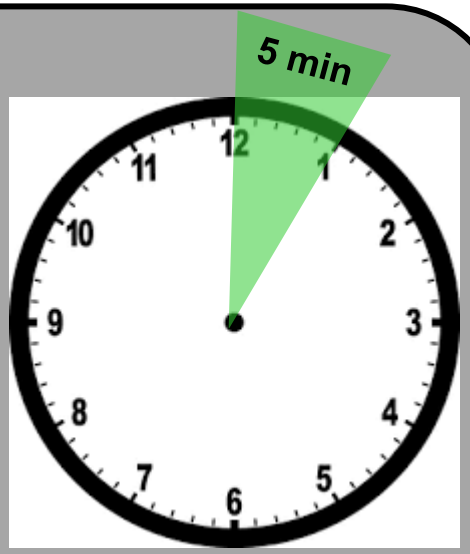
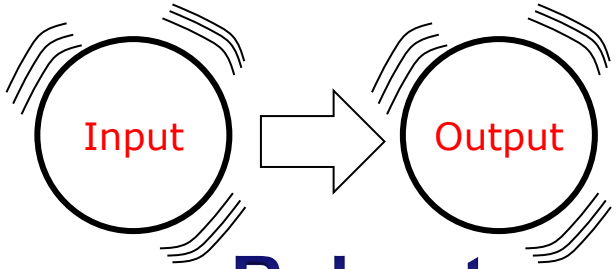


Flexible

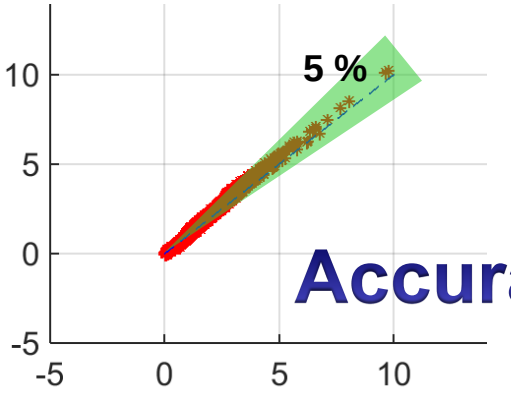
Easy set-up



Fast



Robust



Accurate

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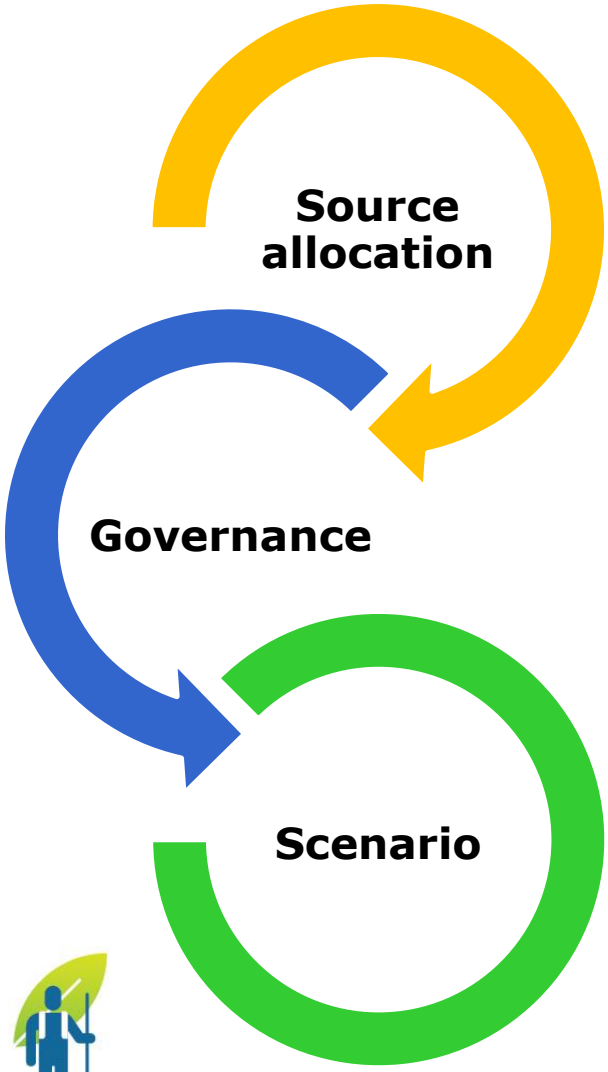
SHERPA loop

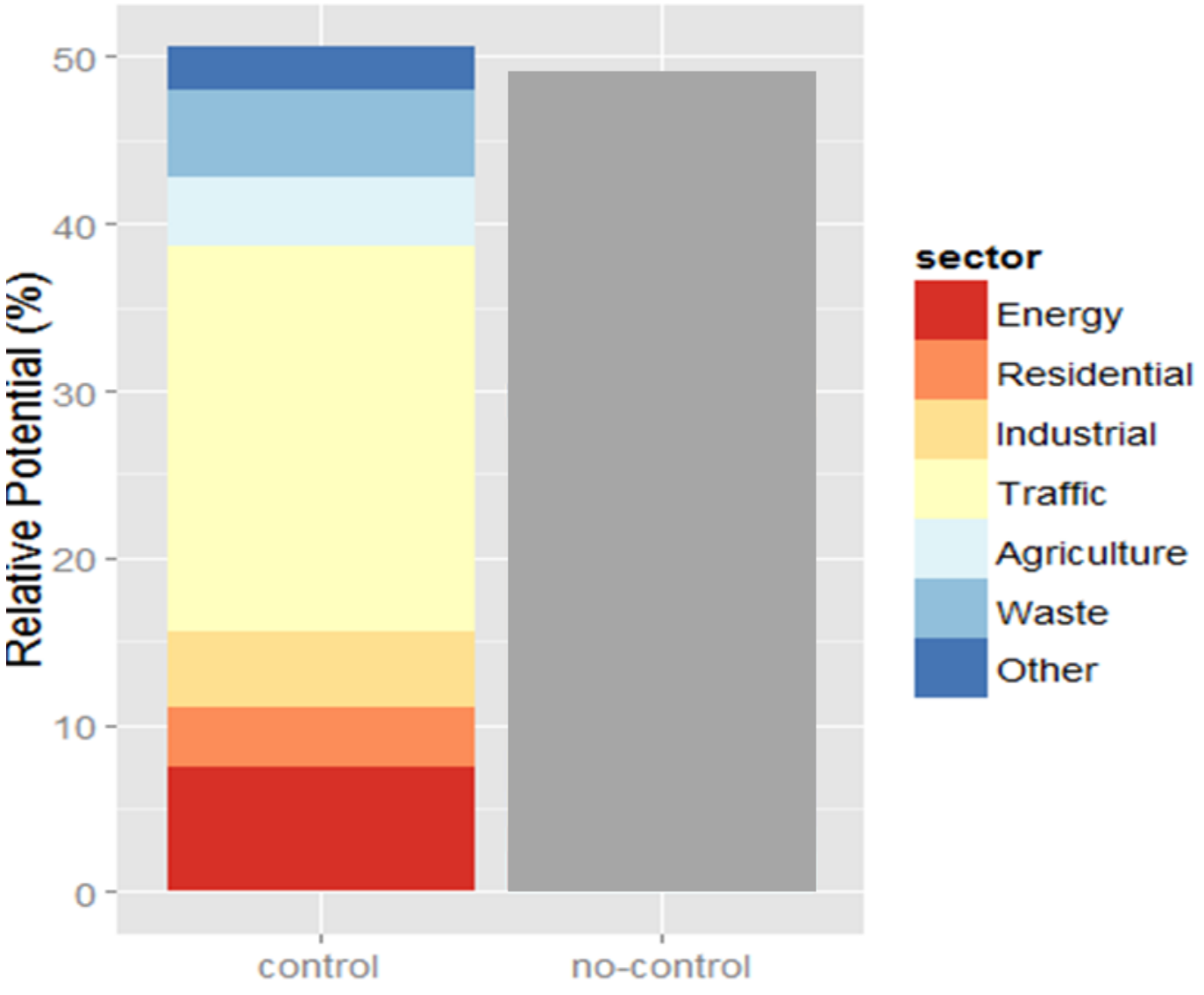


Key sectors/pollutants in my control region?

Should I coordinate actions with my neighbors?

Scenario to be tested, based on previous steps

Step 1:
Source allocation



Step 2: Governance

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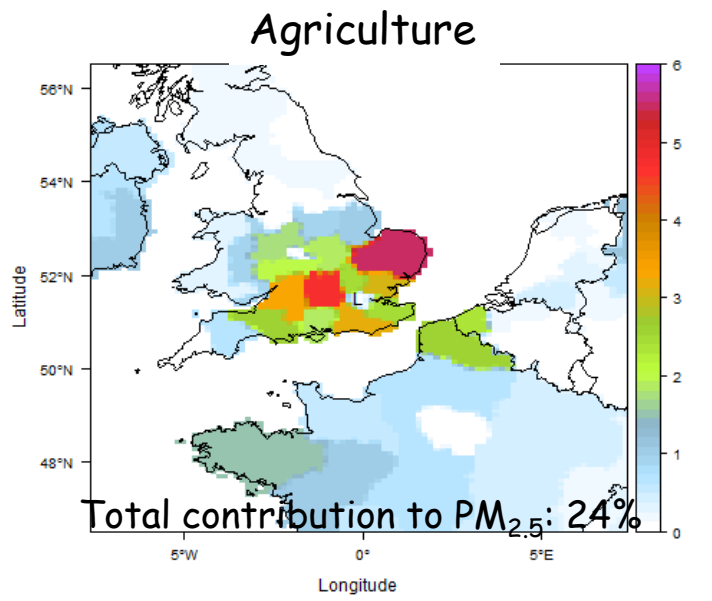

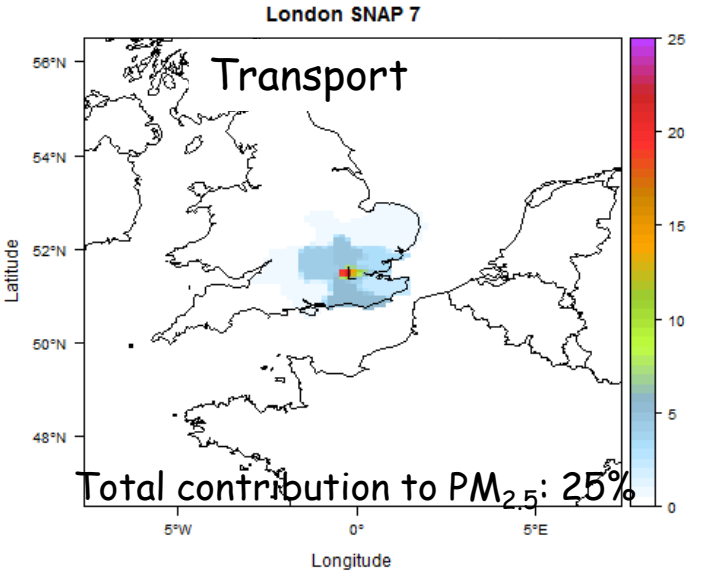

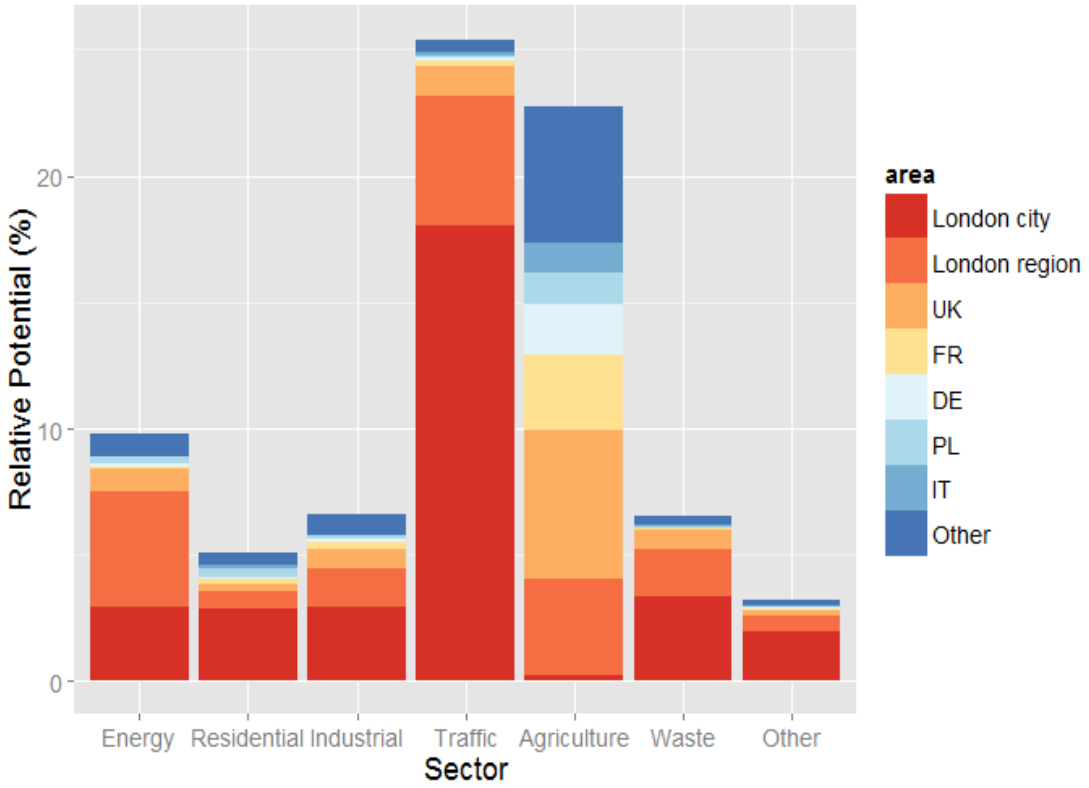

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Step 3: Scenario

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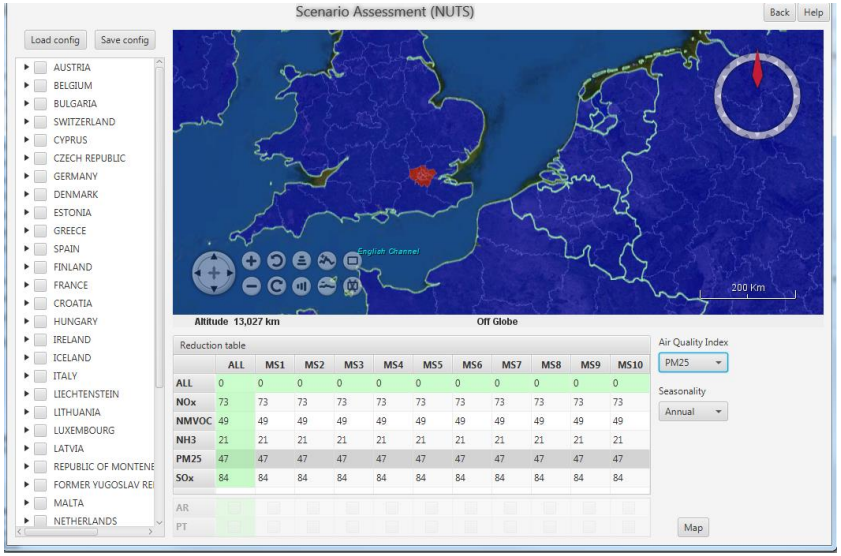

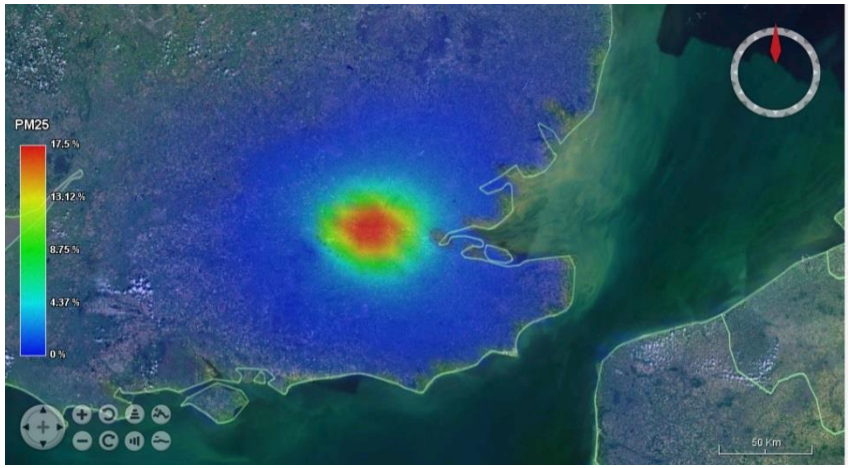

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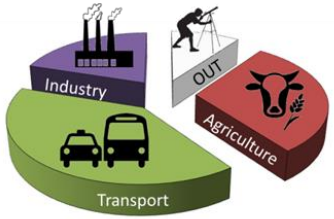
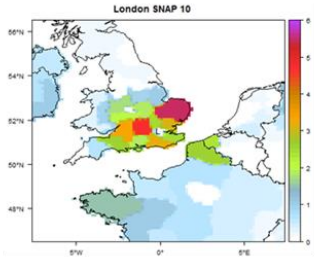


Source allocation



Governance

Impacts

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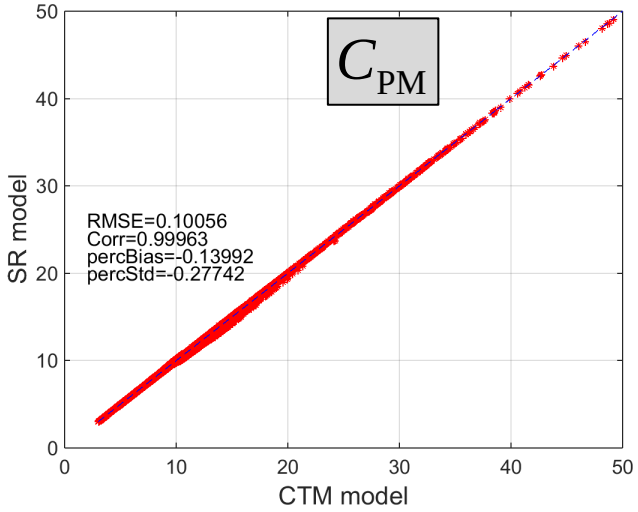
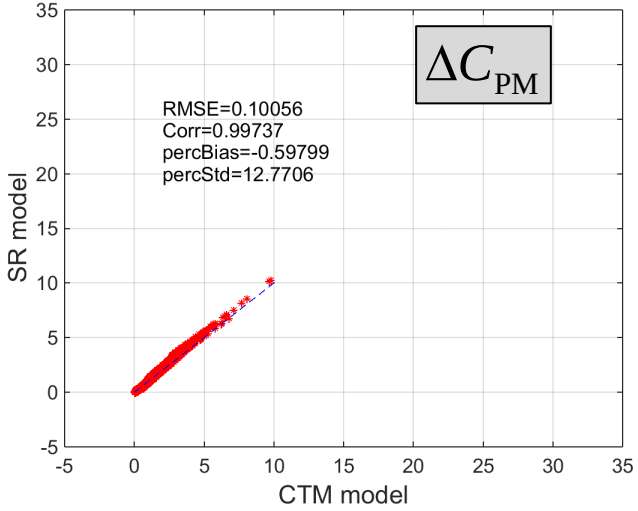
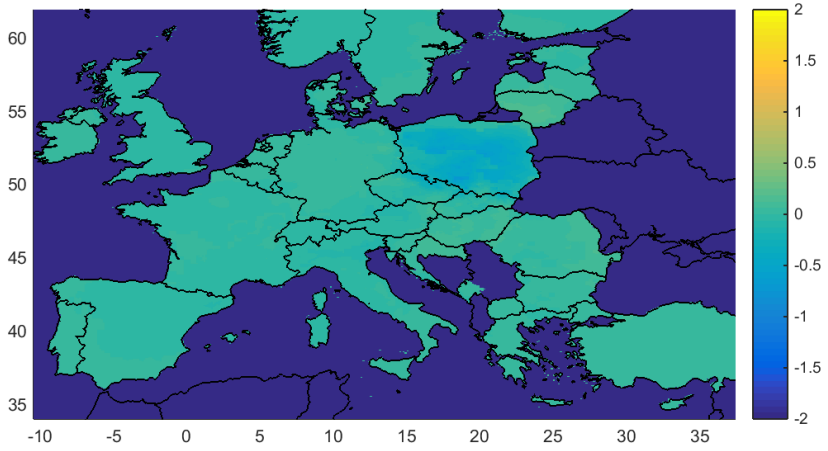
Validation: Poland case

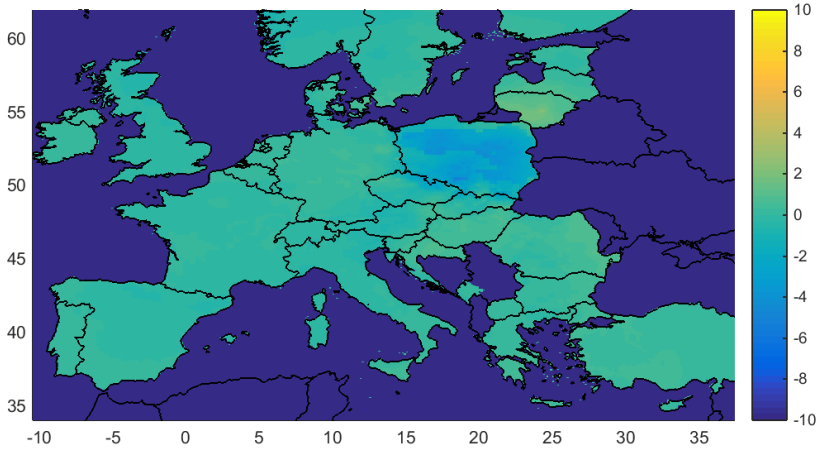




$C_{PM}^{S/R} - C_{PM}^{CTM}$



$\left(C_{PM}^{S/R} - C_{PM}^{CTM}\right) / C_{PM}^{CTM} \times 100$



Flexibility and adaptability

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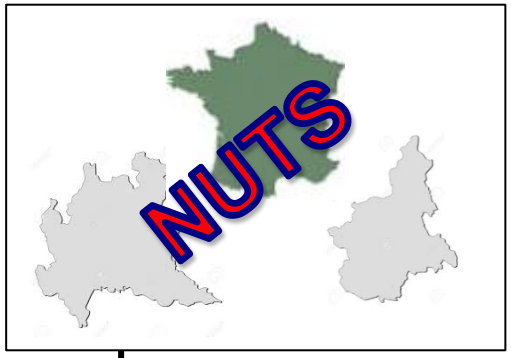
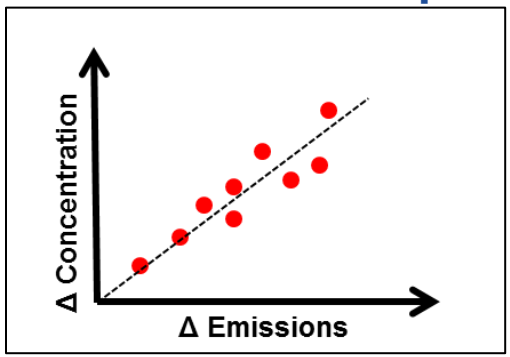
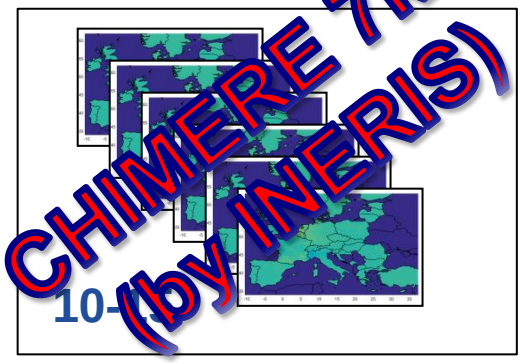
Shapes

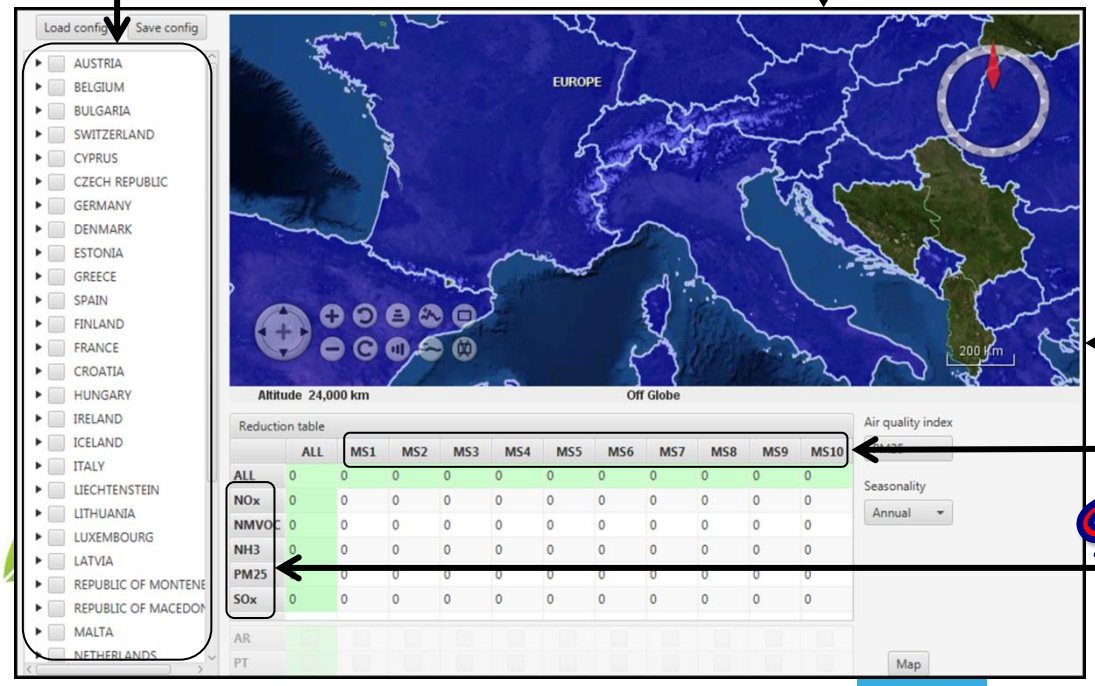


S/R Relationships



AQ Modelling



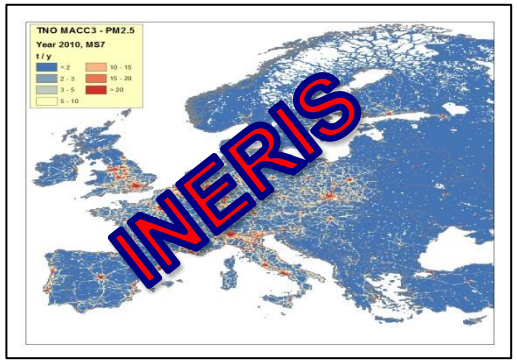


Gridded emissions

SNAP

Sectors

Precursors



Emission Inventory

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Thank-You

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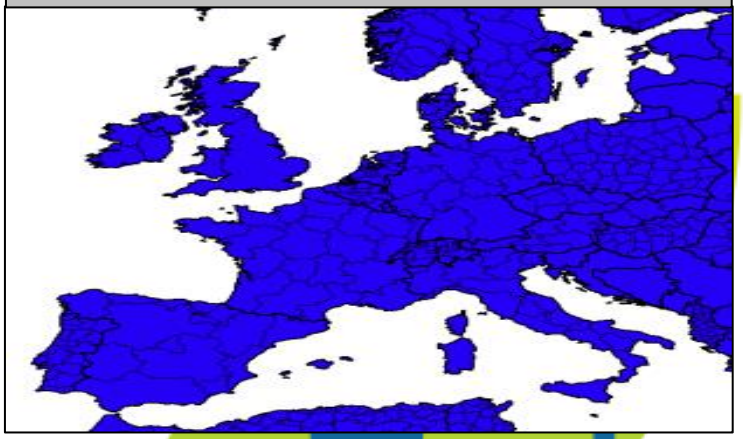
Key module of the system

Training simulations (10-15)

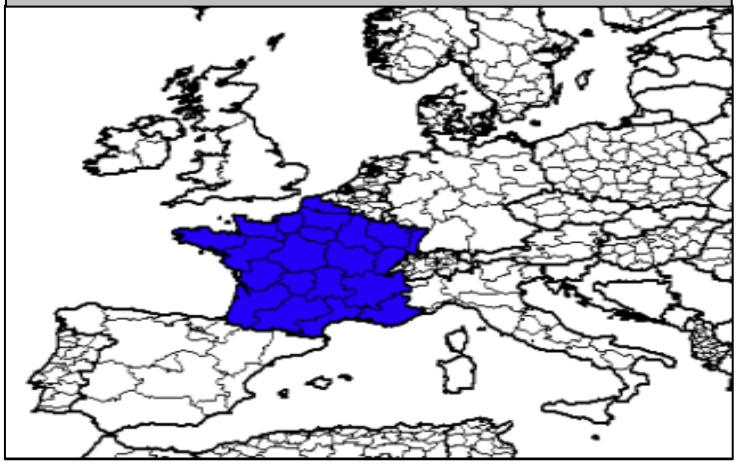


ΔE Europe wide $\Rightarrow \Delta C$

S/R simplified relation

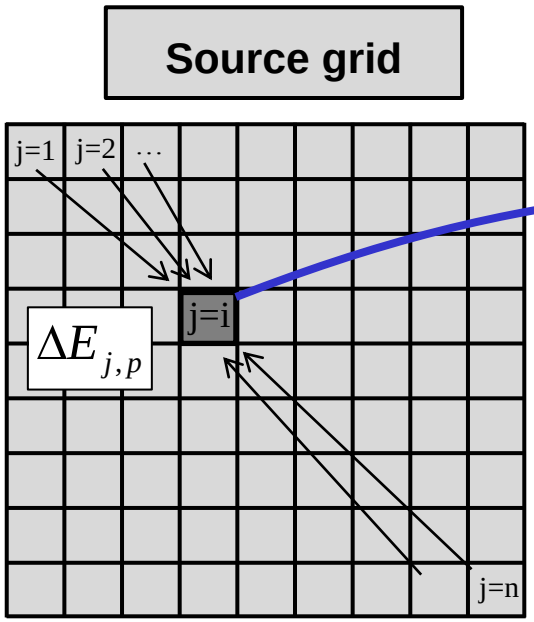
$$\Delta C_i = f(\Delta E^{p}_{dom})$$

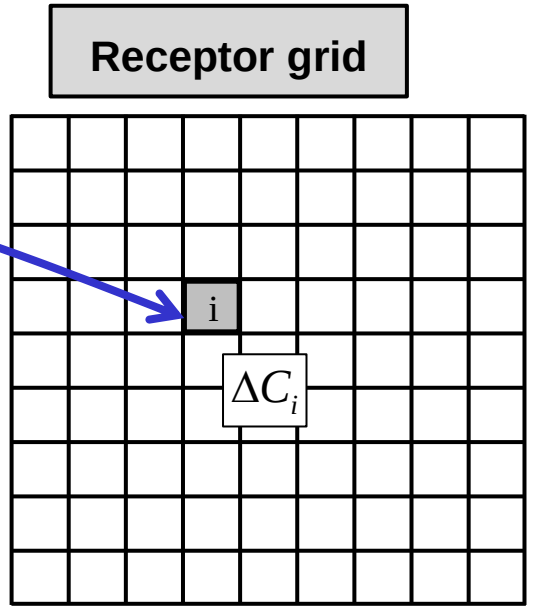
Validation / Application

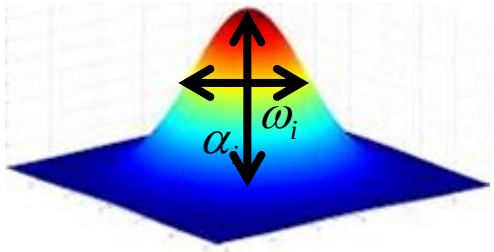


ΔE Country / region $\Rightarrow \Delta C$

Key module of the system







ω_i width

α_i amplitude

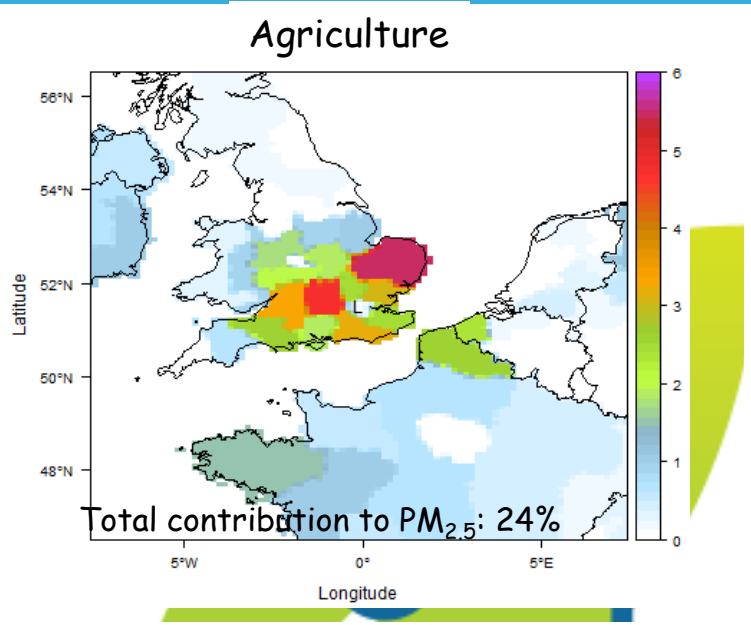
d_{ij} is the distance between the receptor i and each source cell j.

$$\begin{matrix} \vdots & \vdots \\ \Delta C_i^{SC1} & \Delta E_{j,p}^{SC1} \\ \Delta C_i^{SC2} & \Delta E_{j,p}^{SC2} \\ \Delta C_i^{SC3} & \Delta E_{j,p}^{SC3} \\ \vdots & \vdots \end{matrix}$$

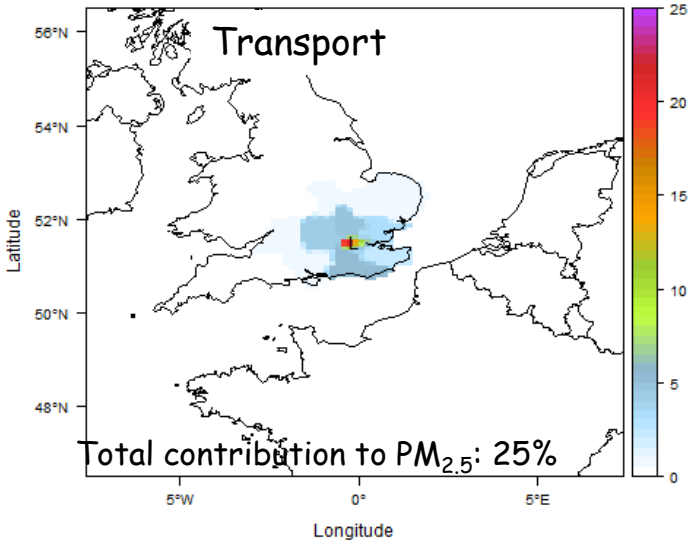
$$\Delta C_i = \sum_{p=1}^{n_p} \alpha_{i,p} \sum_{j=1}^{n} \left(1 + d_{ij}\right)^{-\omega_{i,p}} \Delta E_{j,p}$$

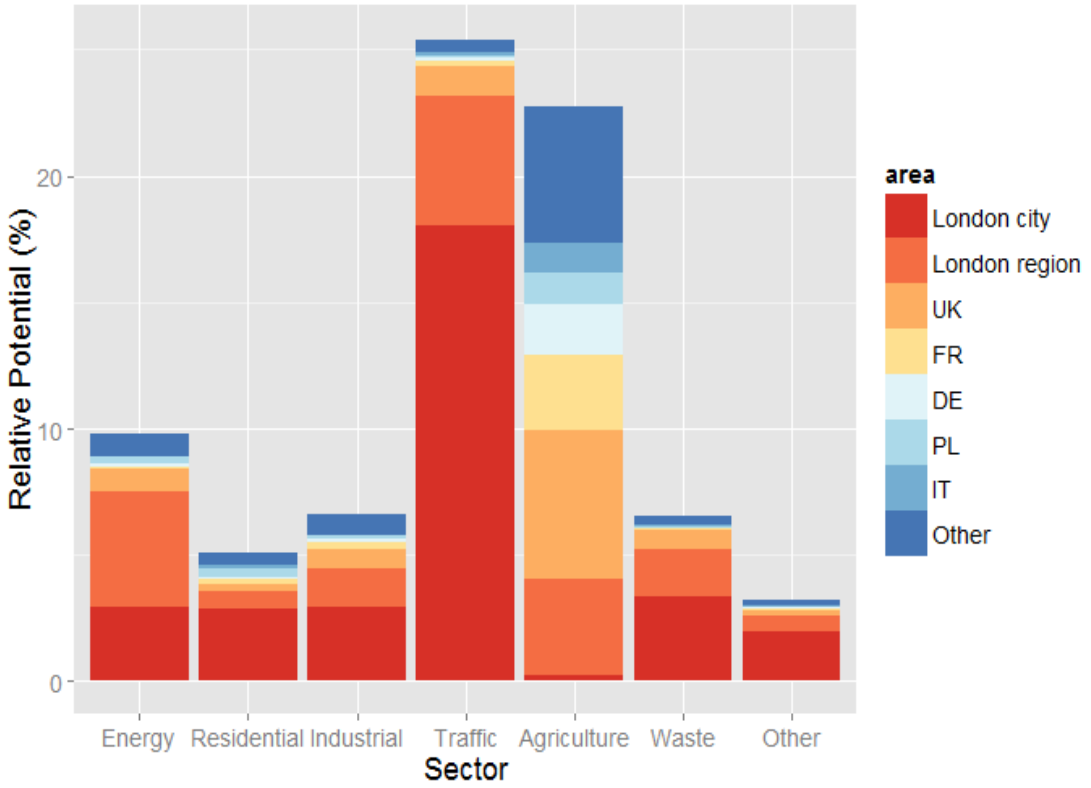
where $\alpha_{i,p}$ and $\omega_{i,p}$ are 2 unknowns calculated using **a 10 to 15 scenarios.**

Source apportionment



London SNAP 7





Agenda

15:00-15:45 ***Discussion***

15:00-15:20 *How can we foster synergies between source app. and planning?*

15:20-15:45 *How FAIRMODE activities can be used to support authorities in the design and assessment of AQP?*

15:45-16:15 ***Coffee break***

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