European Commission

Fairmode Technical meeting SHERPA evaluation

Athens

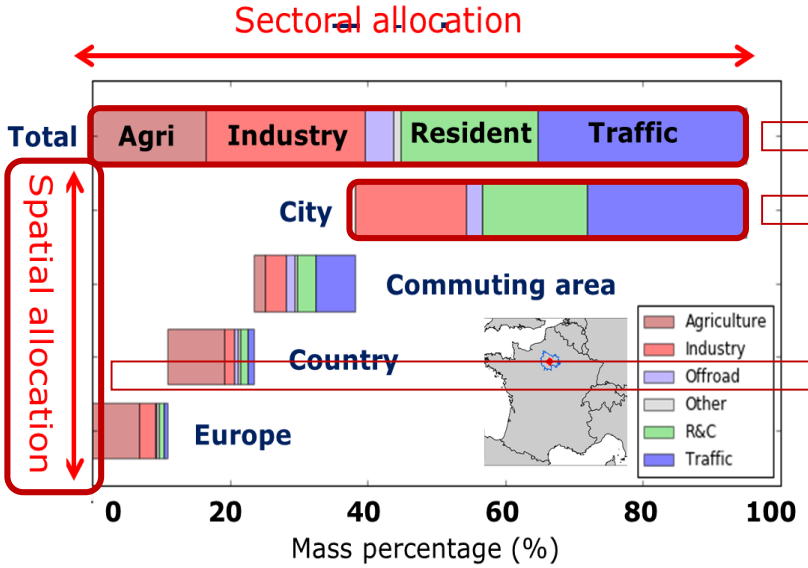
19-22 May 2017

Joint Research Centre

SHERPA: what do we need to validate?

European Commission

Source apportionment

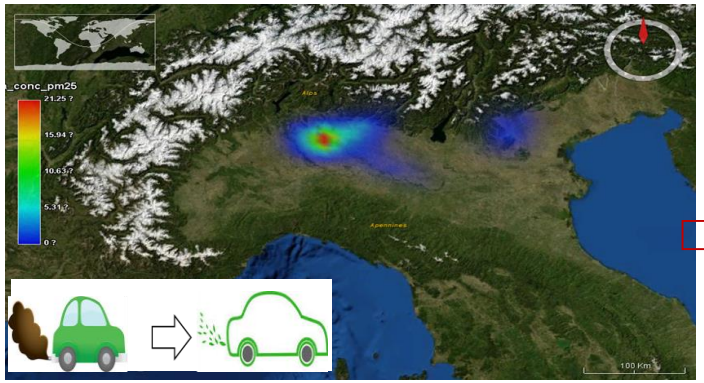


Total shares

Local shares

Spatial allocation

Impact Assessments



Scenario impact

Joint Research Centre

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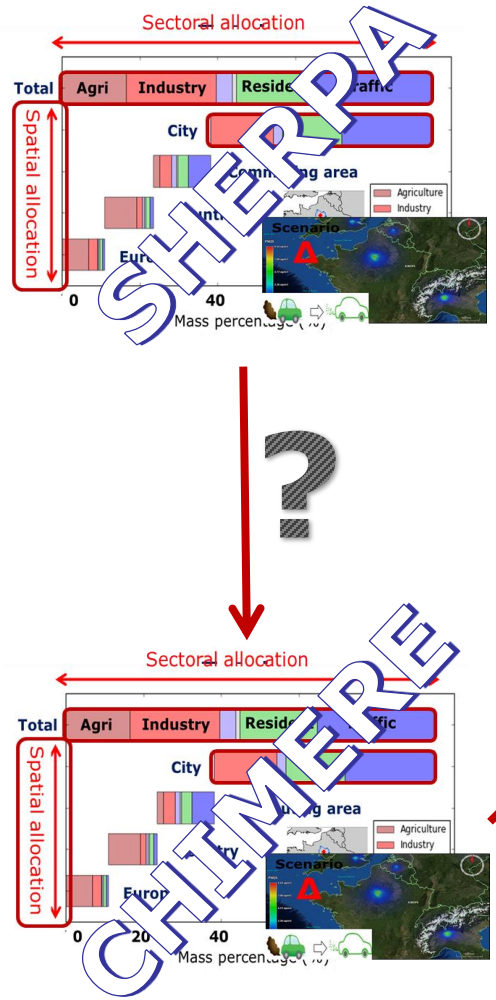
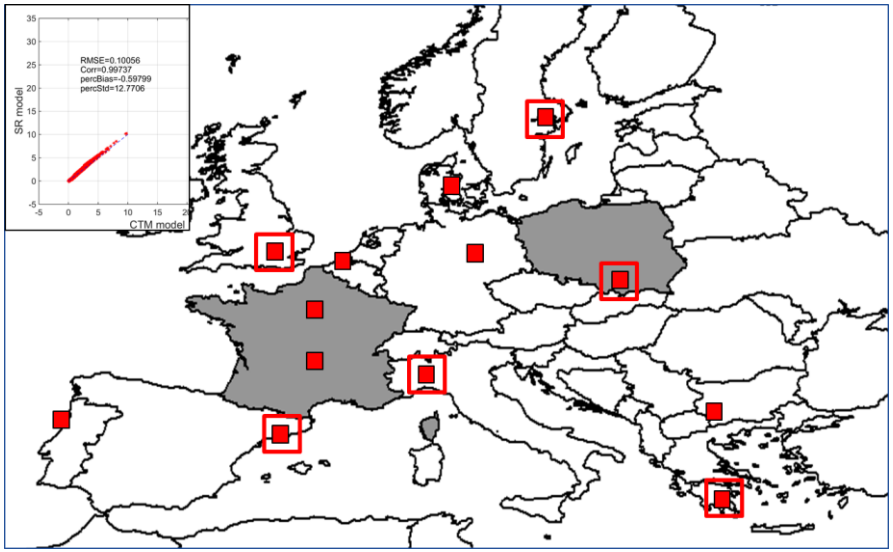


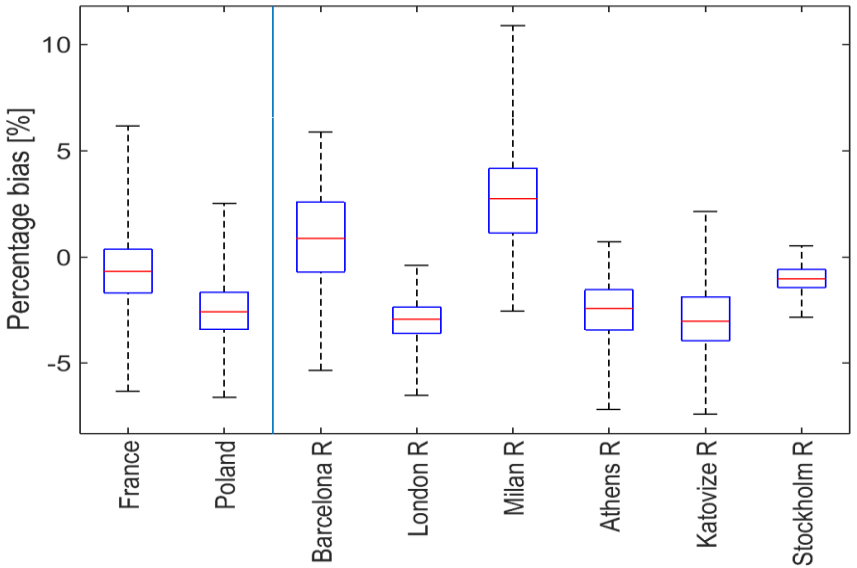
- Model
- Meteorology
- Emissions
  - Spatial shares
  - Sectoral shares

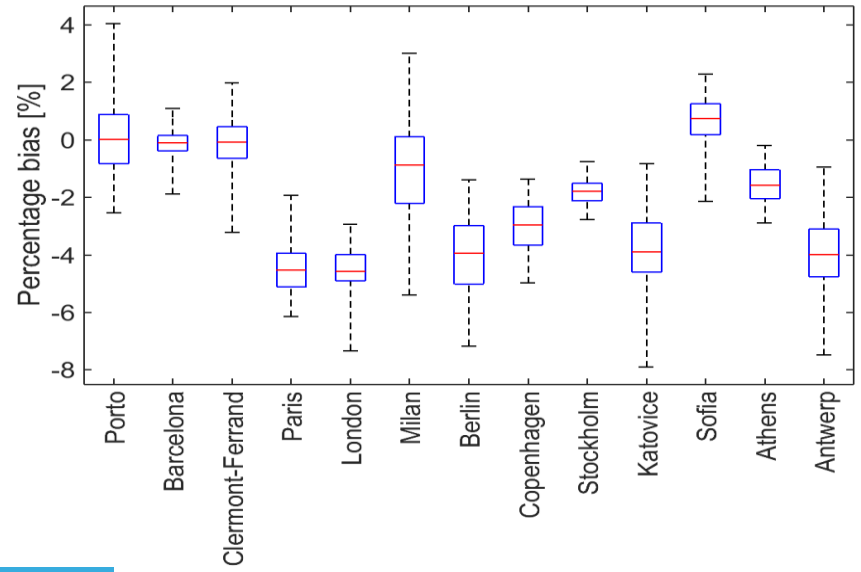
SHERPA – CTM Evaluation

2 countries, 6 regions, 13 cities

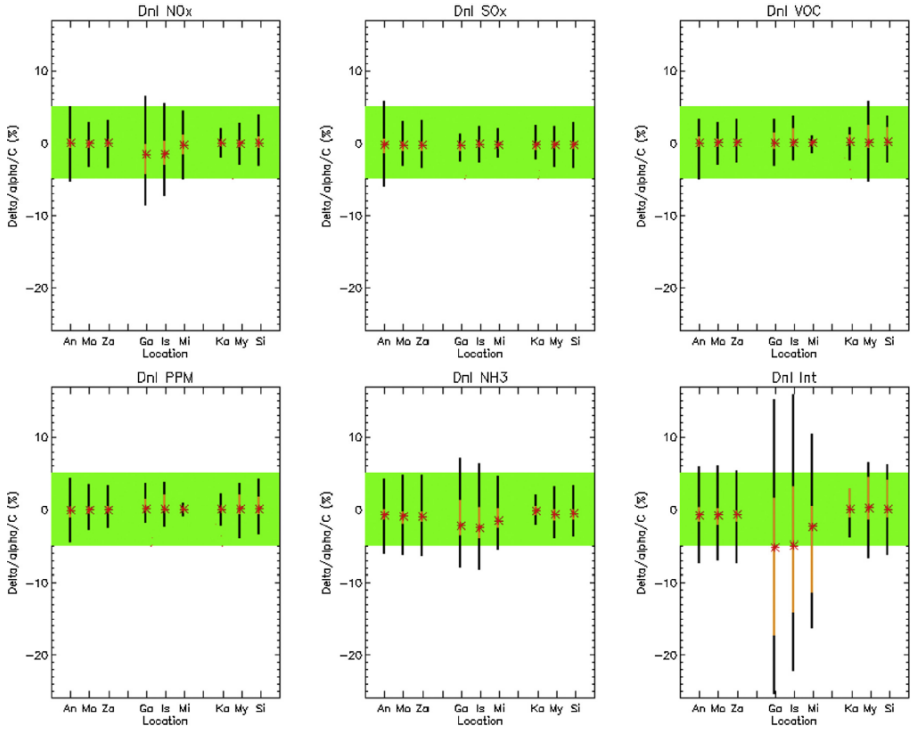


Clappier et al. 2016, Pisoni et al. 2017 Env. Software
Thunis et al. 2017 J. Env. Management.





SHERPA – CTM Evaluation



Thunis et al. 2015, Atm. Env.; Clappier et al. 2017

Non-linearities for PM_{10}

- Daily: ~20 to 25%
- Monthly: ~15 to 20%
- Yearly: < 5%

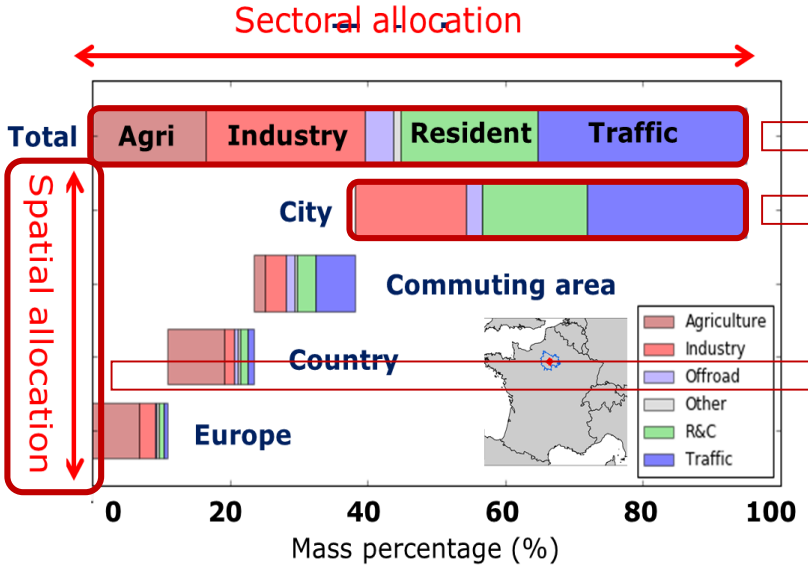
Conclusion 1: SHERPA ≈ Fast linear CHIMERE

Conclusion 2: Source apportionment ≈ planning

SHERPA: what do we need to validate?

European Commission

Source apportionment



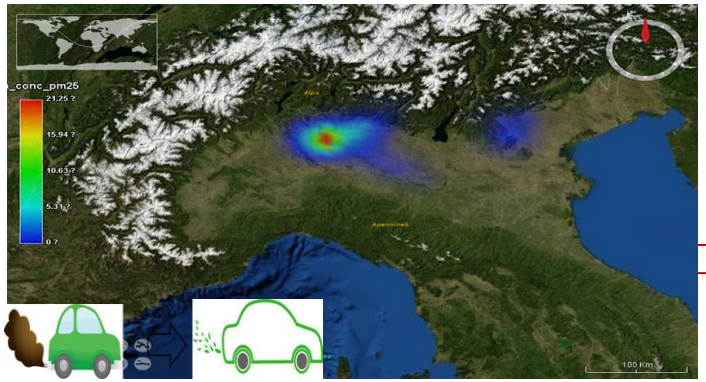
Total shares

Local shares

Spatial contributions

OR

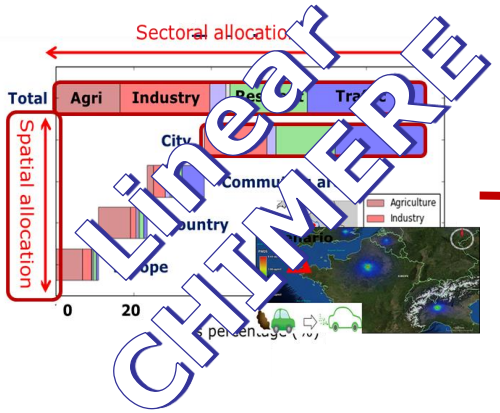
Impact Assessments



Scenario impact

Joint Research Centre

CTM: what do we need to validate?



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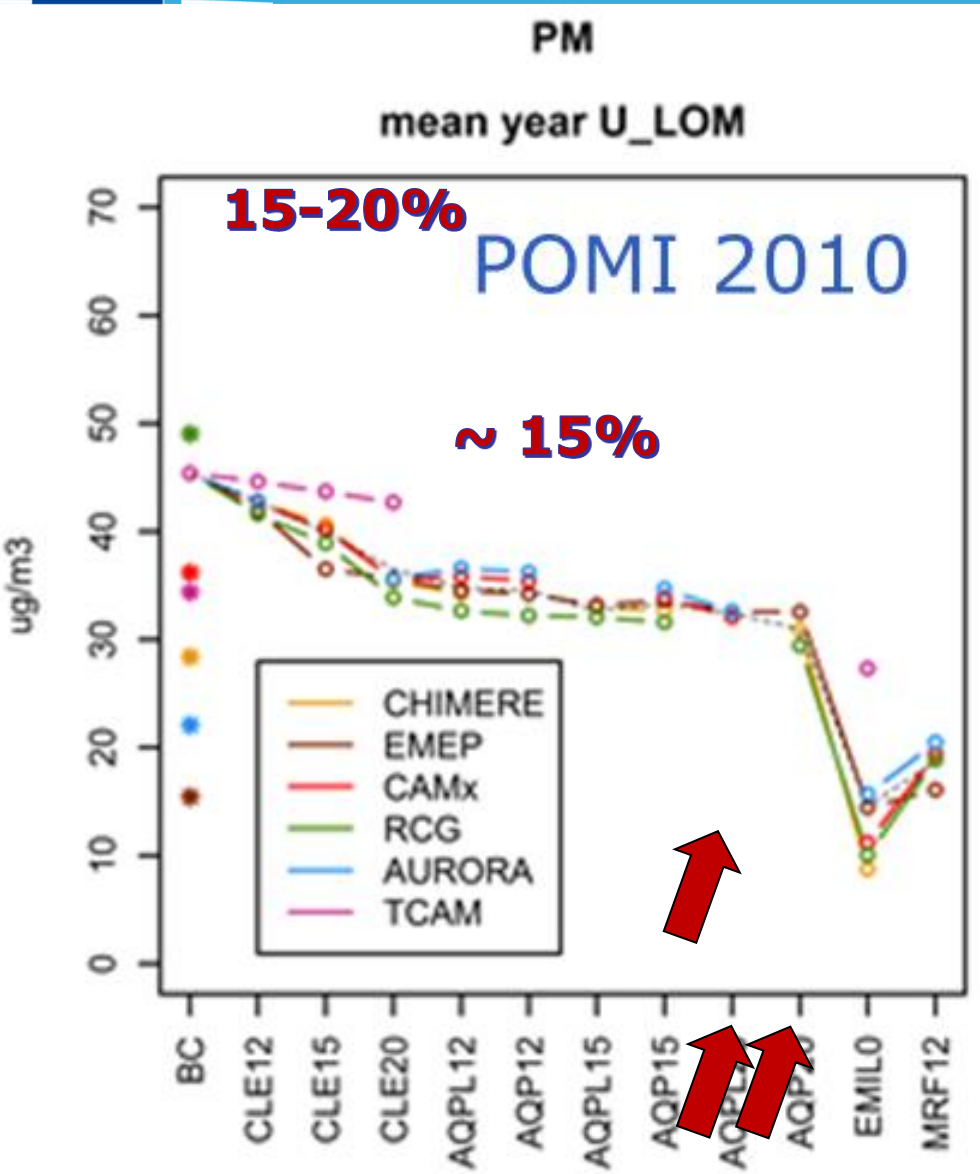
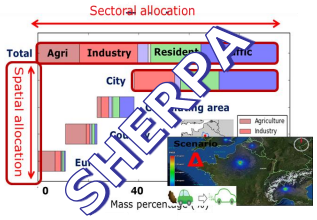


Suggestions for the evaluation of the CTM (I)

European Commission

Can we test SHERPA in the Src. App. Inter-comparison exercise?



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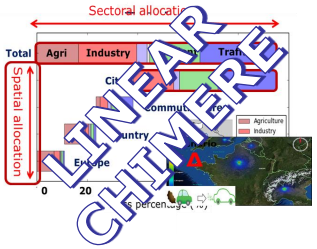

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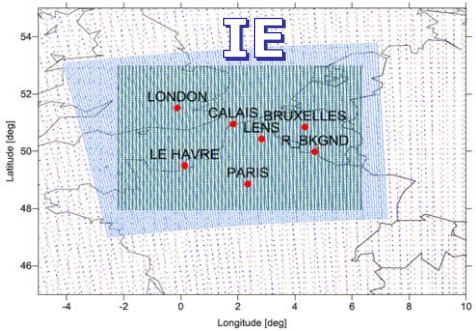
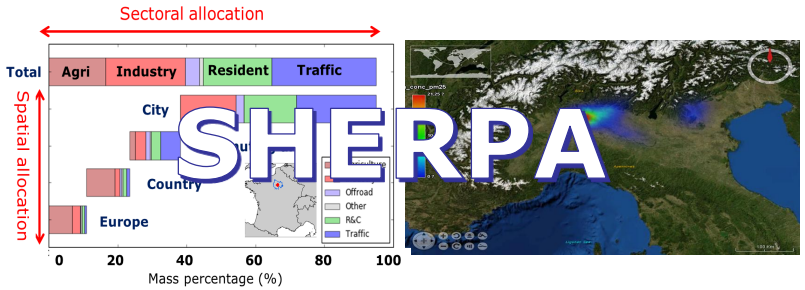


- ✓ The total share could be compared
- ✓ The local vs. regional contributions or local shares cannot be compared
- ✓ We do not know how linear is the inter-comparison test case
- ✓ Input data are not the same (meteorological year, emissions…)

If results agree well we will not know why
If results do not agree we might guess possible causes but will not know how to quantify them.

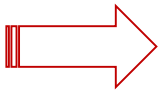
Suggestions for the evaluation of the CTM (II)

I. Use existing impact assessments and compare them with SHERPA responses



Existing Local Exp.

- Total share
- Local share
- Local contribution



Emissions
Receptor models
CTM simulations
WG4 indicators

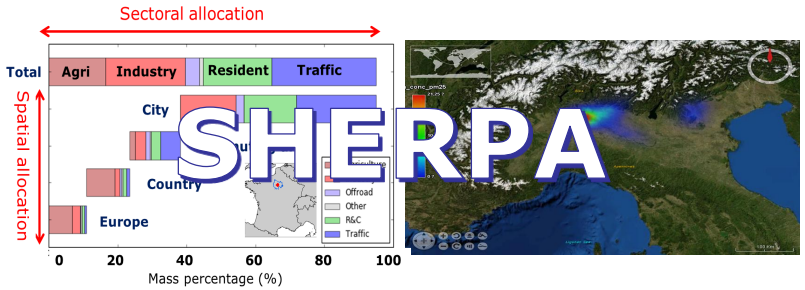
❑ Examples

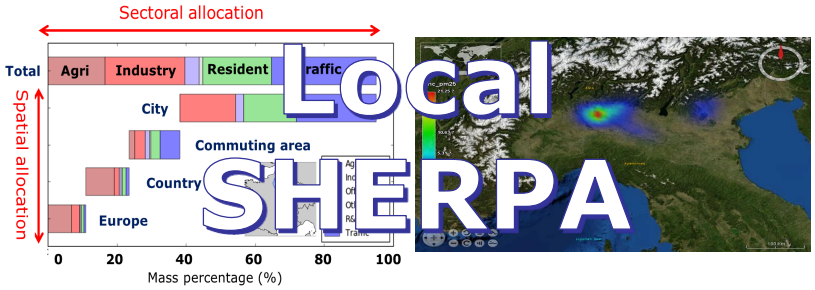
- Helsinki → Industry
- Paris → Industry
- Milan → Residential heating

Suggestions for the evaluation of the CTM (III)

European Commission

II. Generate new sensitivity analysis (Bottom-up SHERPA)





- Total share
- Local share
- Local contribution

Emissions
Source Receptor
CTM simulations
WG4 indicators

- Example
  - Emilia Romagna
  - …?