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Forum for air quality modelling in Europe

WG2 Emissions

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Session on WG2: Local/Urban Emissions

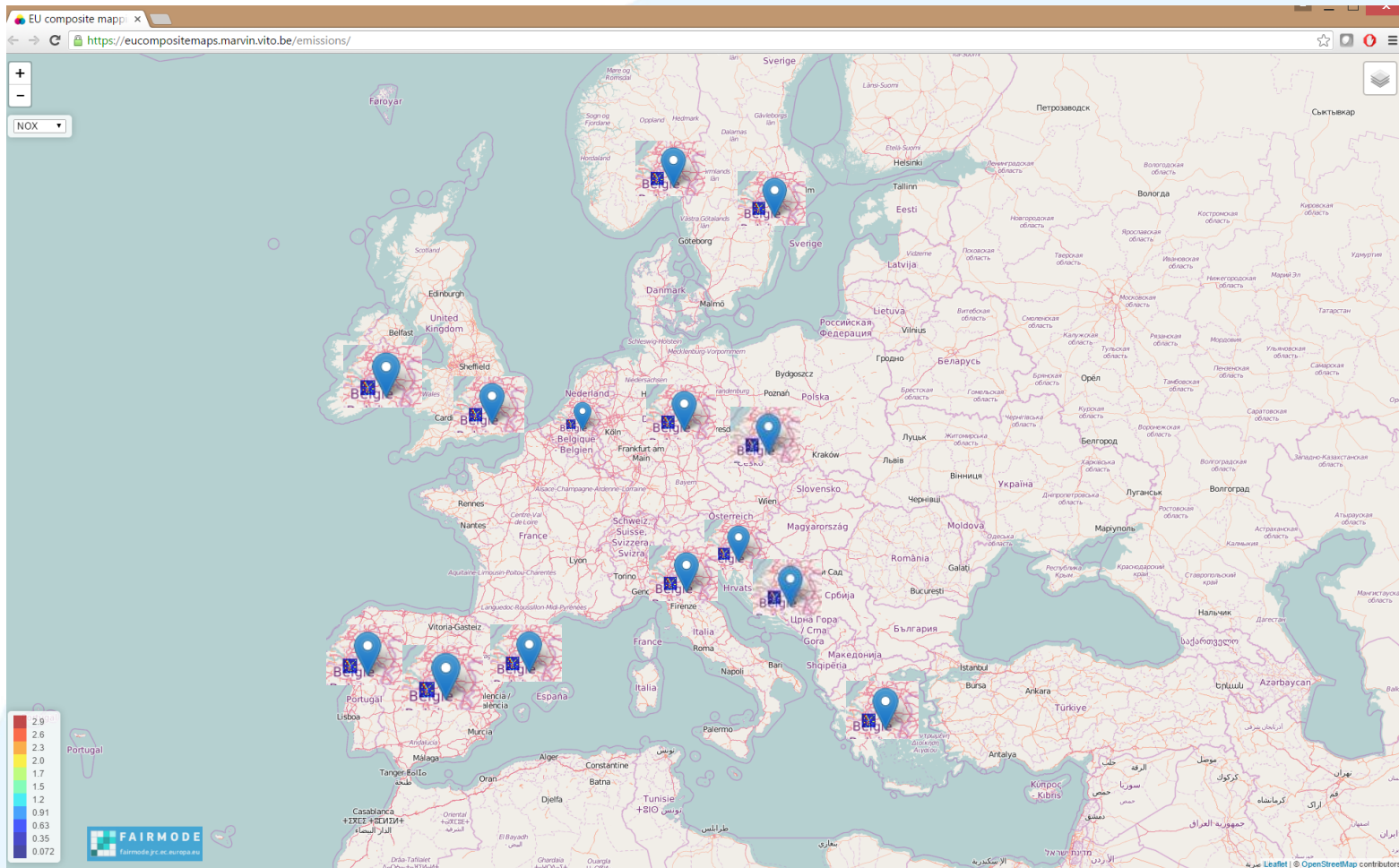
Part 1

1. Emission composite mapping exercise: What do we learn?
2. Comparison with bottom-up inventories: which are the priority sectors?

Part 2 (after lunch)

3. Guidance from FAIRMODE WG2: How should be organized?
4. Collaboration FAIRMODE-CAMS: how and what?
5. Recommendations from WG2

Composite mapping for emissions



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Table of Content – Emission Composite Map

- Emission Composite mapping capabilities
- Country lessons learnt
 - Norway
 - Sweden
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- Messages to Copernicus
- Messages to JRC
- Messages to EMEP -TFEIP



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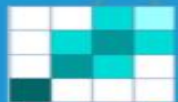
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Emission Mapping Capabilities

- Visualisation of spatial patterns
- Quick first check of emission results
- Comparison of inventories - emission densities and totals
- Requires knowledge on emissions to interpret the results of the comparison

2 current applications

- ✓ Pilot exercise
- ✓ Evaluation of regional inventories



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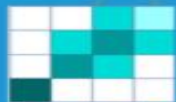
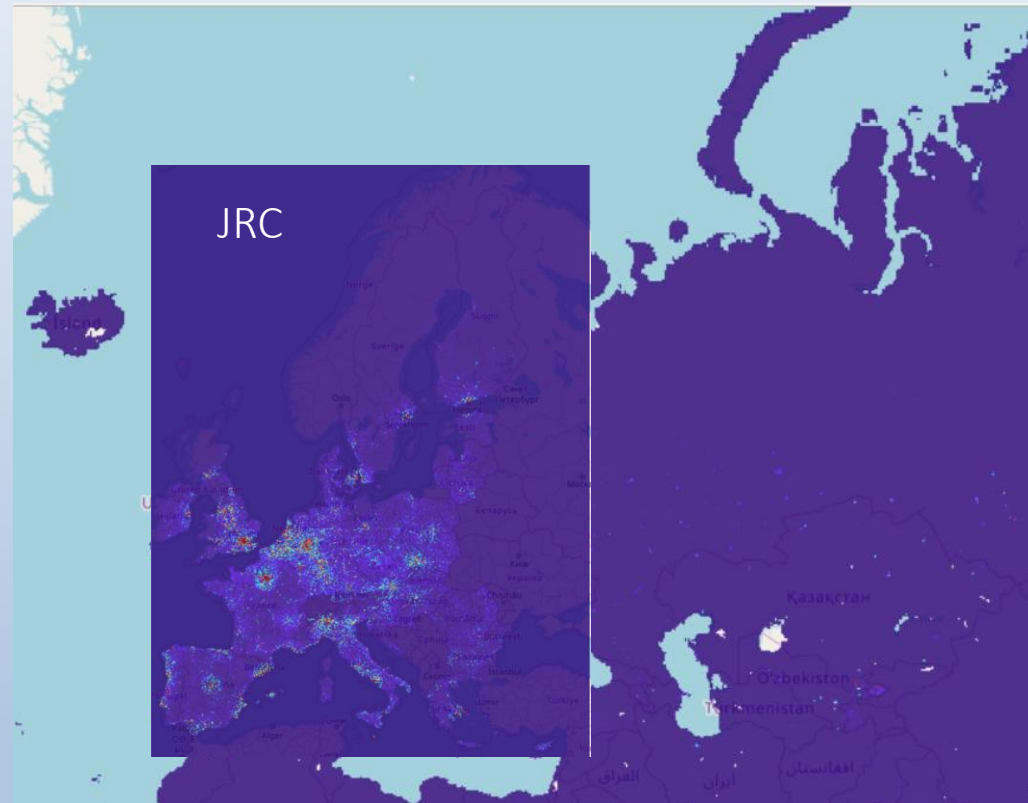
Evaluation of Regional Inventories

➤ Regional inventories currently in the Mapping Tool

- Copernicus 2011 TNO-MACC-III
- EMEP 2015 (0.1x0.1)
- JRC 2010 (1x1km)
- *EC4MACS not included yet*

➤ Analysis for 2 activity sectors

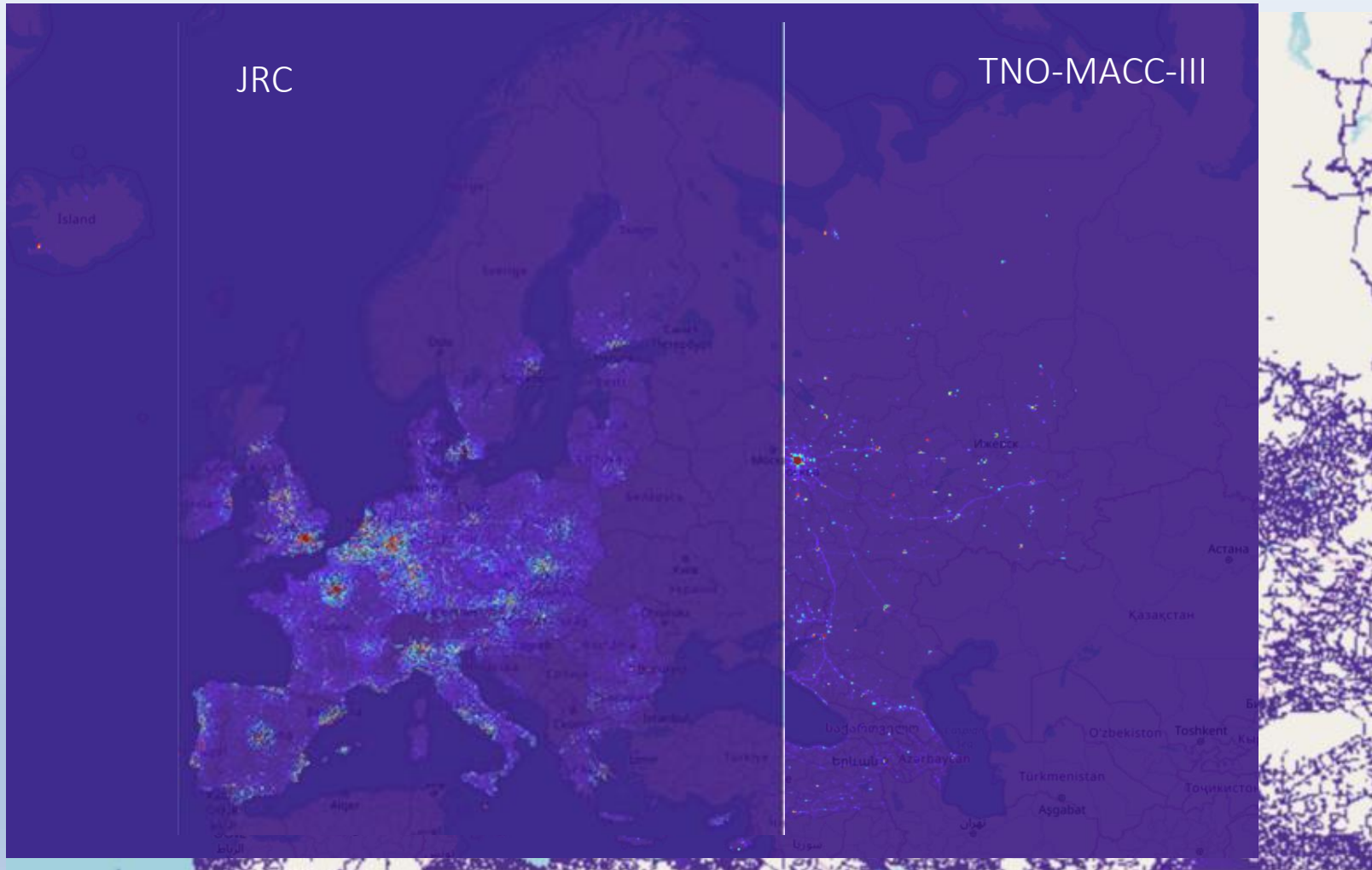
- Domestic heating (S2)
- Traffic (S7)



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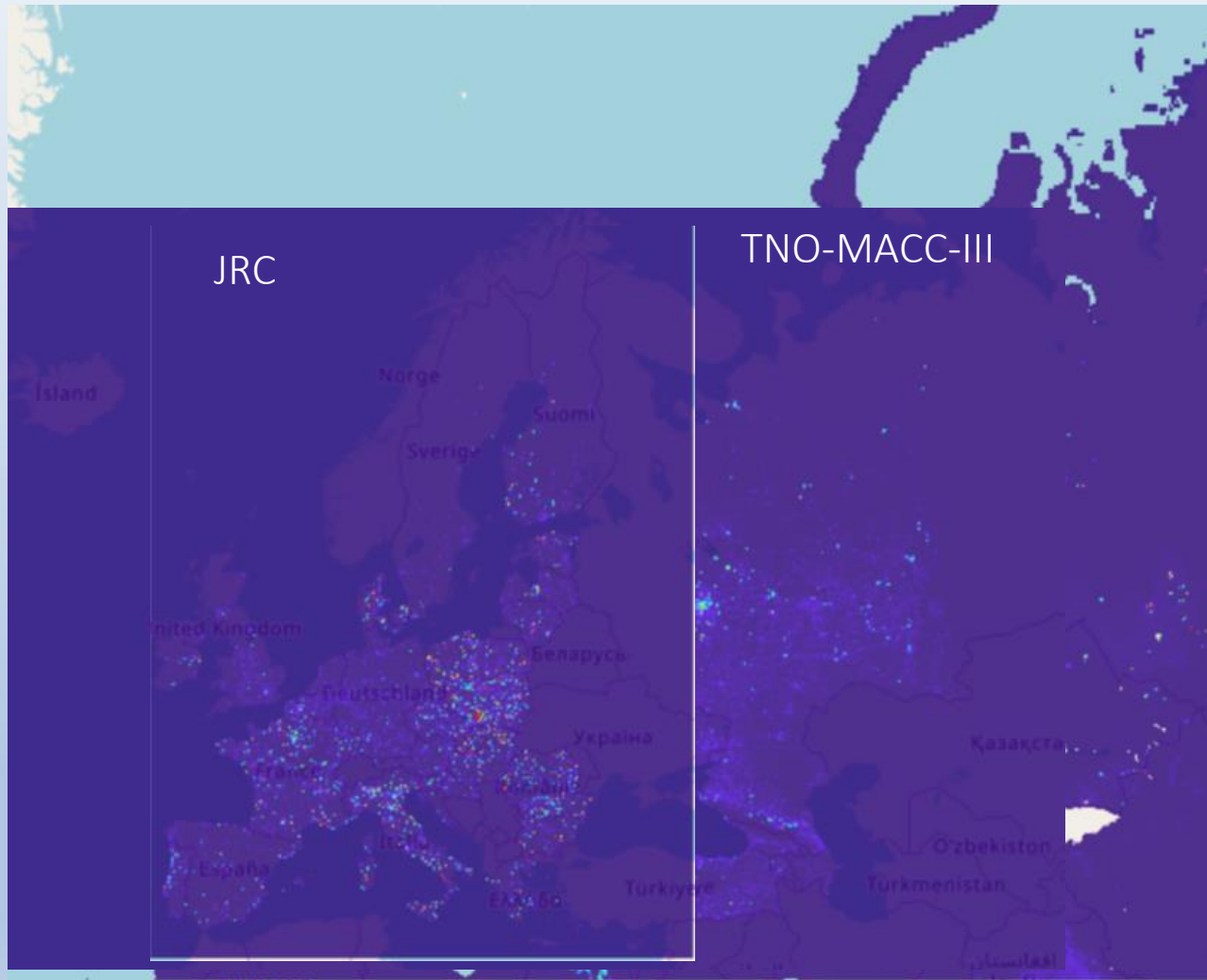
Traffic Emissions (S7)



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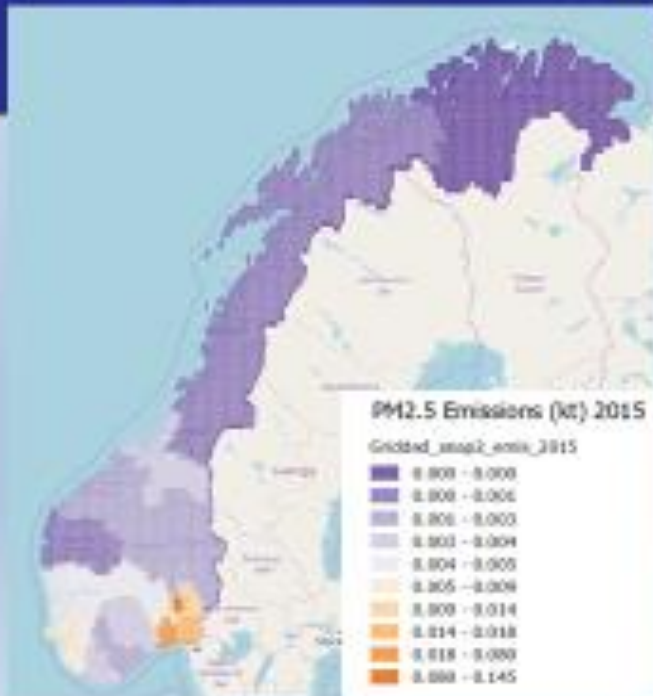
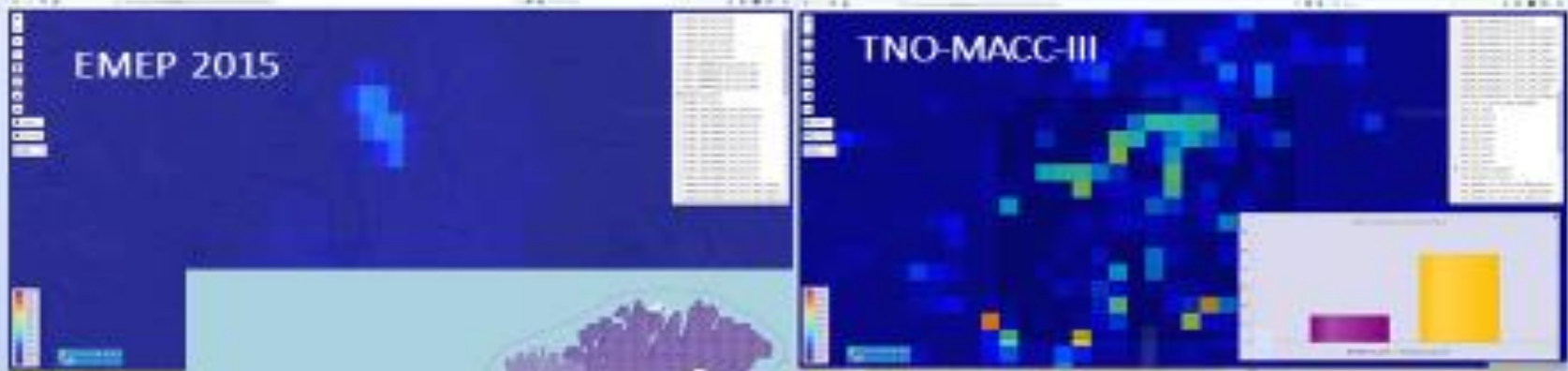
Domestic Heating Emissions (S2)



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Wood burning for Residential Heating Inconsistencies in EMEP 0.1x0.1 regional emission inventory



EMEP inventory has distributed residential combustion uniformly over the counties in Norway

On-going dialog



Sweden



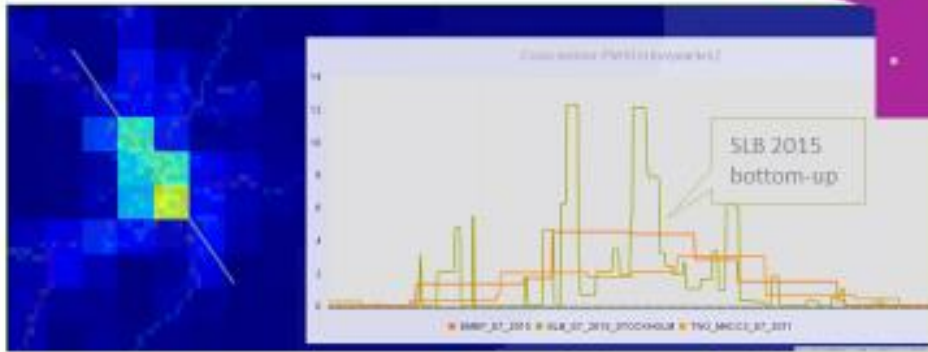
Composite mapping on emissions – Stockholm

–PM10s7 road traffic



Sweden's submission 2015:

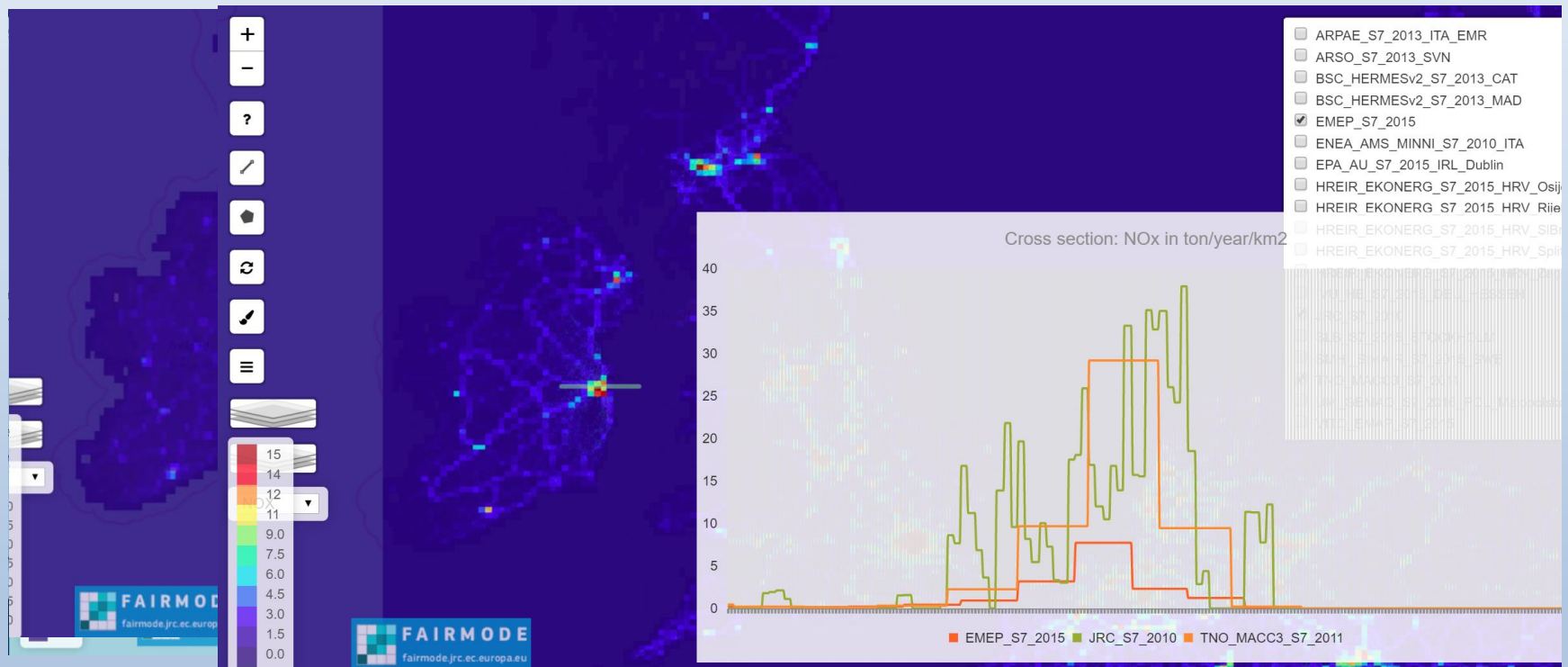
- Resuspension of road wear PM is included (increase almost a factor 2)
- Different share of studded tyres depending of region



TNO-MACC-II takes into account traffic volume and vehicle fleet better than EMEP
Swedish SLB inventory with refined vehicle fleet composition
Re-suspension taken into account in EMEP – not TNO

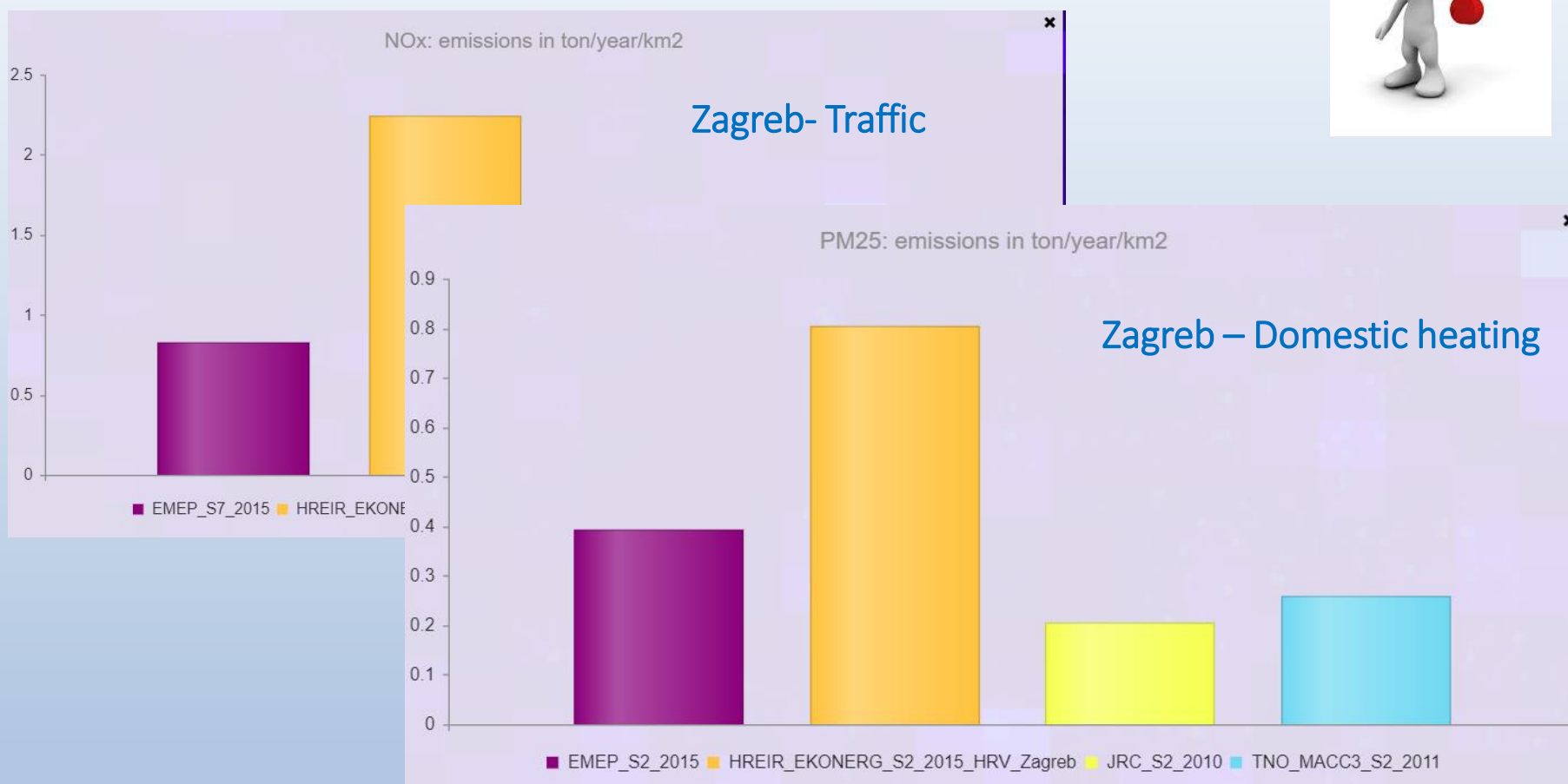
Ireland

Same experts are compiling the EMEP 0.1x0.1 inventory and the Dublin inventories - but the results do not agree!



Systematically low emission data in Dublin – all compounds
Problems with the transmission of the data during the Pilot?
Wrong data in uploaded in the Composite Map Fairmode page?

Croatia



Ekoneg always higher emissions than any regional inventory NOx. PM10 and PM2.5 (S7 & S2)

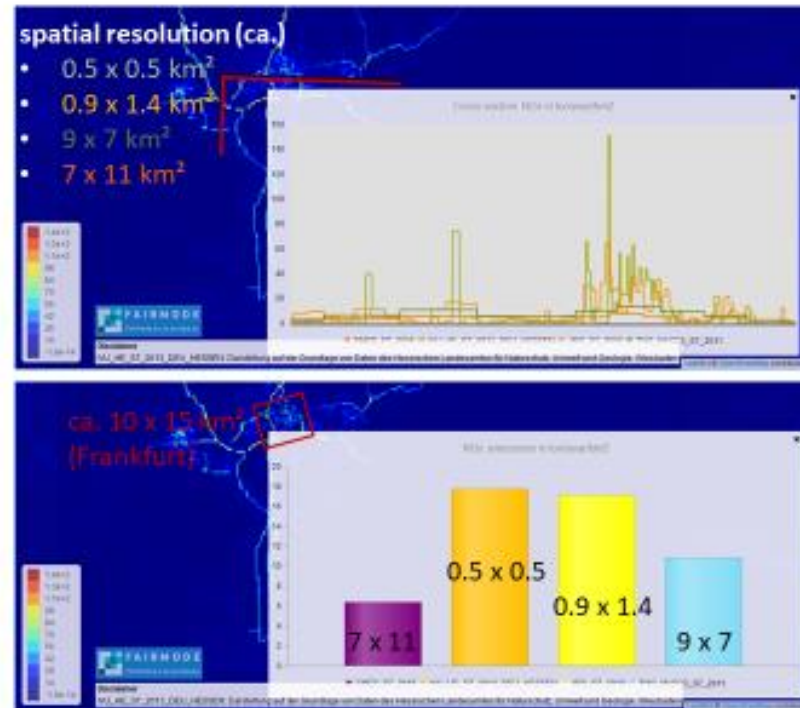
- Vehicle fleet composition?
- Resuspension ?
- Better proxies for residential heating? **Document and contact EMEP responsible in Croatia**

Germany – Hessen state



“Composite mapping on emissions” – (DE-Hessen state)

- “Size matters!”
high resolution important for differentiated ground sources (road traffic)
- use caution when creating average emissions for sub-regions (averaging effects of coarse resolutions)



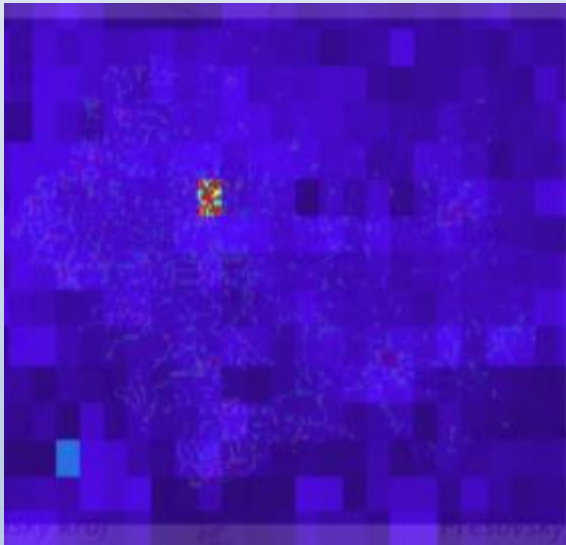
Need to explain why the EMEP inventory is lower than TNO-MACC-III

- 1) Is re-suspension included?
- 2) Is the composition of the actual fleet taken into account?
- 3) Is traffic flow data taken into account in the EMEP inventory?

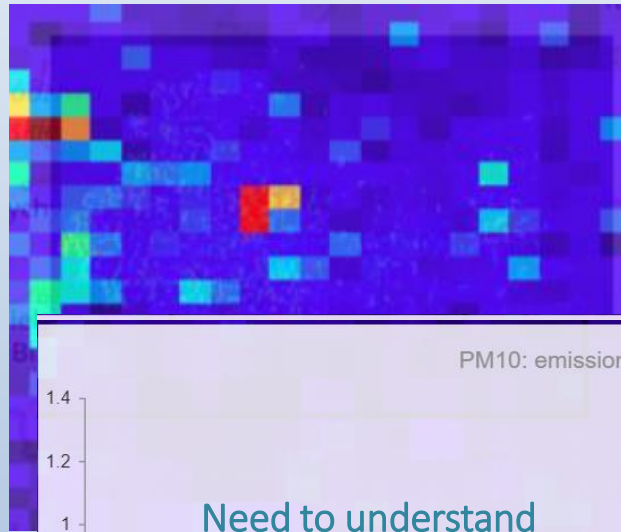
Poland– Małopolska



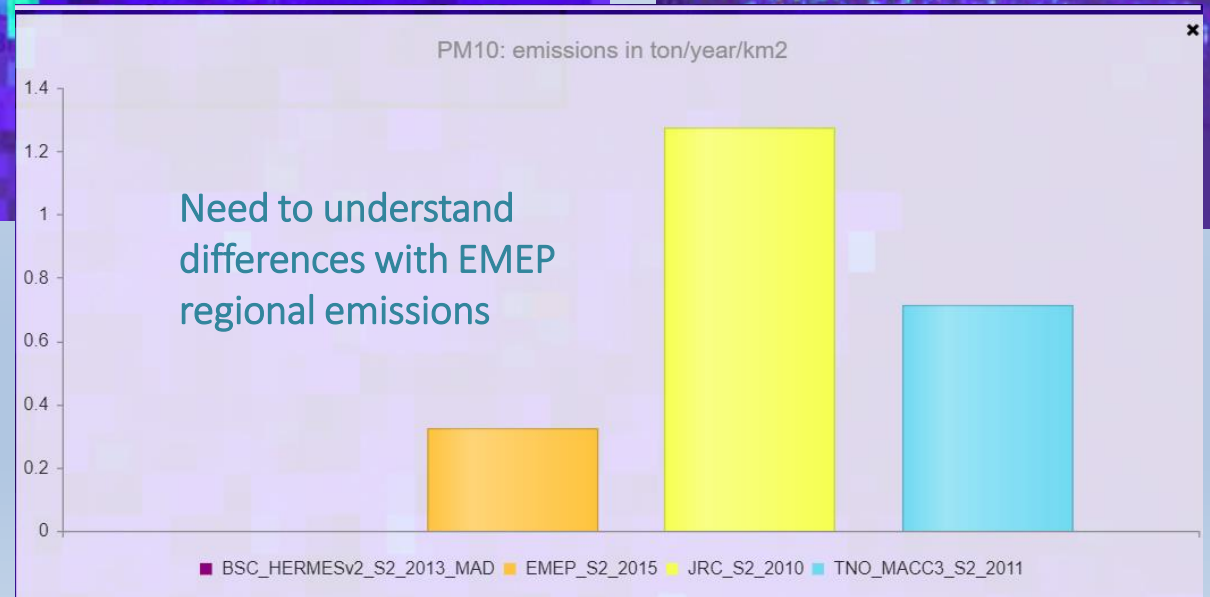
- EMEP 2015



- TNO-MACC-III 2011



- ATMOTERM



Messages to Copernicus

- Harmonised European wide approach
- Traffic emissions distributed according to actual traffic volumes in roads – in urban areas biases due to technology choices
- Lower domestic heating emissions in western Europe than reported officially by EMEP, generally higher emission in eastern Europe.
- Well documented inventory
- Good cooperation with FAIRMODE – building trust

Messages to JRC

- JRC spatial coverage limited in Northern and Eastern Europe
- Generally too high traffic emissions around city areas – do you rely on actual traffic data per road link?
- High domestic heating emissions surrounding city areas in Central and western Europe – what is the spatial proxy used?

Messages to EMEP -TFEIP

- Visible differences between countries in their mapping routines
- **Traffic emissions** biased to road links – little evidence of the weighting traffic emissions with actual traffic volumes, as indicated in the results around large urban areas.
- **Domestic heating emissions** with irregular coverage (Iceland, Bulgaria, Turkey, Kyrgyzstan missing) PM emissions from domestic heating (S2) larger than TNO_MACC_III in Western Europe – lower in Eastern Europe – downscaling proxy not documented
- Methodology for spatial disaggregation needs documentation at IIR – currently missing
- Downscaling routines need improvement in some countries – added value of FAIRMODE community work

Follow-up – TFEIP

- Following the Pilot Study activities, contact the national EMEP 0.1x0.1 2015 inventory experts, where possible, to:
 - Request documentation of the methodology used for spatial distribution and compilation of emissions
 - Establish dialog on methods used by both parts
 - Explain the differences in S7 and S2 estimates identified in the Pilot
 - Summarise the findings in 2 pages
- Compile results in a paper to TFEIP - demonstrate added value of FAIRMODE

Would this be possible before
the Technical meeting?

Thank you for your attention