

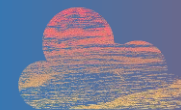


# Practical issues modelling activities at the JRC

## Air quality modelling

Directorate C: Energy, Transport and Climate  
Unit C.5: Air and Climate Unit

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Joint  
Research  
Centre

# The Air Chemistry Transport models at the JRC

1. **EMEP model**, developed by Norwegian Meteorological Institute (<https://www.emep.int/>)  
Version rv4\_34, 0.1 x 0.1.
  2. **WRF-Chem model**, developed by NOAA, NCAR, PNNL, NASA and WRF-Chem community (<https://ruc.noaa.gov/wrf/wrf-chem/>)  
Version 3.9.1.
- Both models are Open Source.
  - The models can run at local, regional, hemispheric and global scale (i.e. WRF-Chem).

# Long-term simulations (EMEP)

Reduce emissions by 25% for one single pollutant. The same at 50% reduction.  
(SO<sub>x</sub>, NO<sub>x</sub>, VOC, NH<sub>3</sub>, PPM)

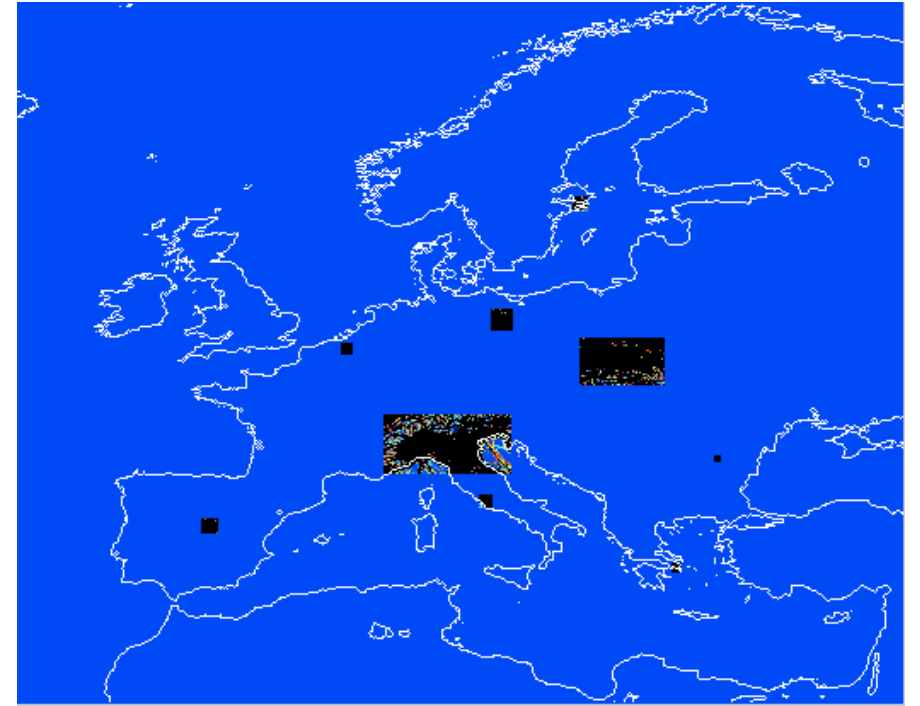
## 8 Cities/Regions:

Madrid	Berlin
Brussels	Stockholm
Rome	Po Valley
Bucharest	Malapolska

## Emissions inventories:

1. Edgar V5 2015.
2. EMEP-GNFR, 2015.
3. CAMS-REG V2.2.1, 2015.
4. CAMS-REG V4.2 + condensables, 2015.

- 8 cities/regions x 4 species x 10 scenarios +1 Base Case = 352 separate files for concentrations per emission inventory (species: NH<sub>3</sub>, NO<sub>2</sub>, O<sub>3</sub>, PM<sub>10</sub>).
- Yearly Emission files per inventory, incl. 7 species (CO, NH<sub>3</sub>, NO<sub>x</sub>, PPM<sub>25</sub>, PPM<sub>Co</sub>, SO<sub>x</sub>, VOC).
- Monthly emissions files for Base Case per inventory.



# Short-term simulations PM and O3

Reduce emissions by 25% for one single pollutant. The same at 50% reduction.  
(SO<sub>x</sub>, NO<sub>x</sub>, VOC, NH<sub>3</sub>, PPM)

## Emission inventory:

1. Edgar V5 2015.

### For PM:

19 Cities

In total 760 files for concentrations + 19 for  
emissions Base Case

### For O3:

14 cities, 2 regions

In total 64 files for concentrations + 16 for  
emissions Base Case

Upload everything to JRCbox:

<https://jrcbox.jrc.ec.europa.eu/>

# Issues

1. Time stamp output Base Case versus Scenarios not compatible when Restart files are used.
2. Bug in reading Logan O3 climatology values when starting simulation 1<sup>st</sup> day of month.
3. For some groups inconsistencies were found between the area for which the emissions were reduced, and the area for which the emissions and concentrations were analysed. In other words, the min/max lon/lat as indicated in Table 1, Annex 2 of the CT9 document, did not agree between area emission reduction and area of analysis.

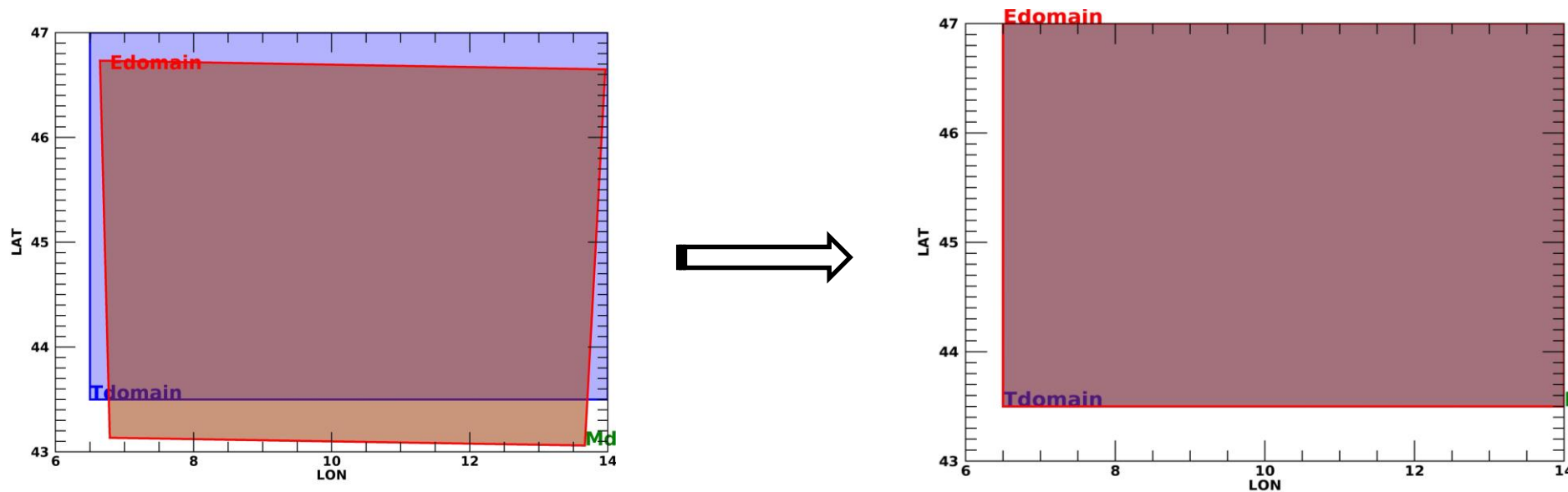
# Edomain and Tdomain

Edomain is domain on which the emissions are reduced.

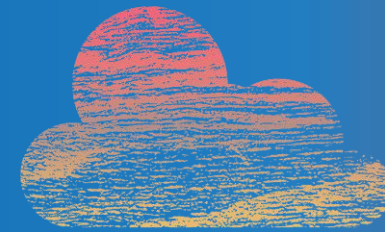
Tdomain is domain on comparison/analysis is made.

Tdomain should be equal to Edomain.

If there's a difference of a few grid cells between Tdomain and Edomain, then we can't make a fair analysis.



# Thank you



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