# FAIRMODE CT9

## Status of the Intercomparison Exercise

(Benchmarking platform for air quality projections)

*FAIRMODE Technical Meeting*

*October 2021*

# Remembering the CT9 Platform | objective...

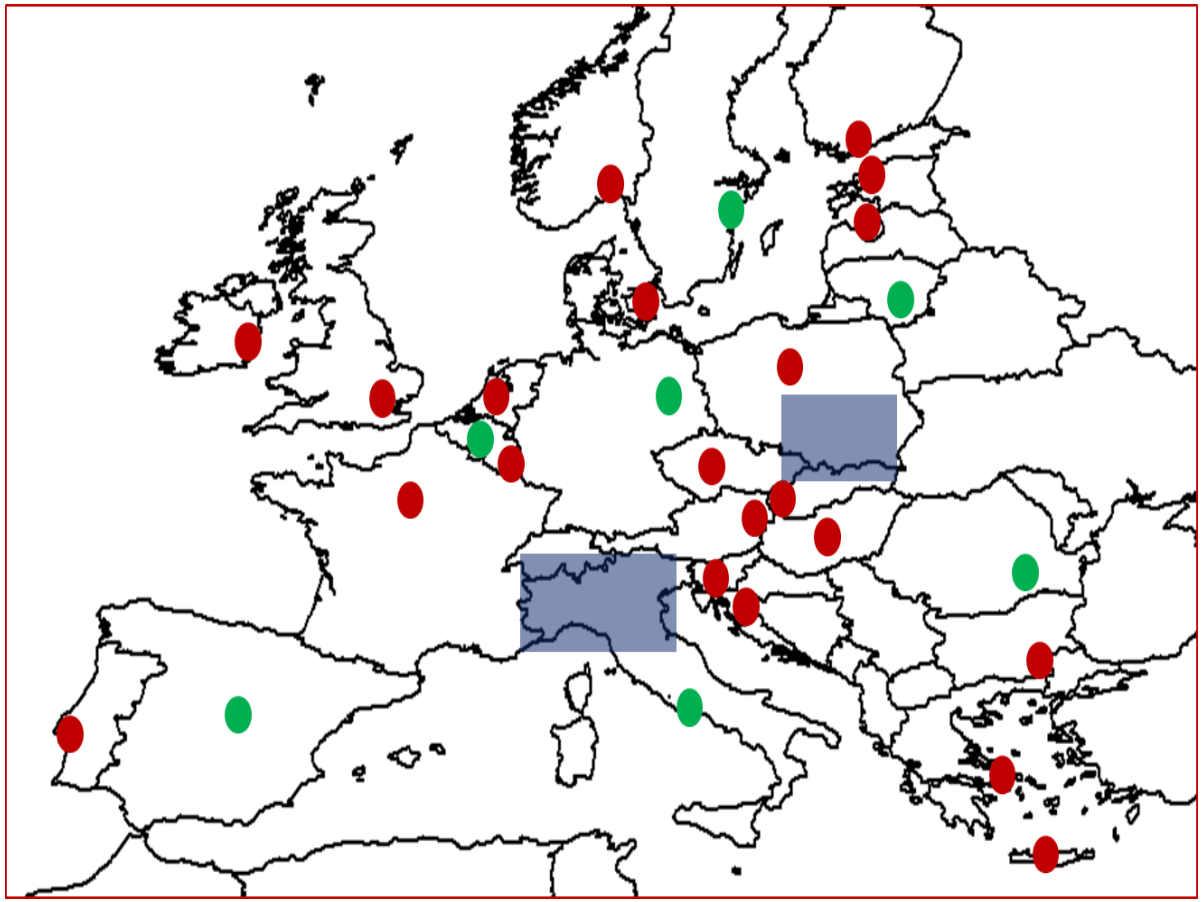
QUESTION:

How to deal with the variability of model responses to emission changes?

PROPOSAL:

An inter-comparison platform: to address the issue of the sensitivity of model responses to emission changes, in particular to assess, discuss, explain and minimize model discrepancies.

# CT9 Platform proposal



intention is not to compare city responses among themselves but to compare model results over a given city

## Platform intended to benchmark and understand differences among modelling system responses to emission changes

- Wide **set of cities in Europe** (mostly EU capitals) plus a **few regions defined**
- Main pollutants: **PM10, NO2 and O3**
- Addressing both **episodes and yearly averages**
- Theoretical scenarios (**25%, 50%)**
- Both to **local & European scale** modelling systems
- **Platform rather** than an exercise

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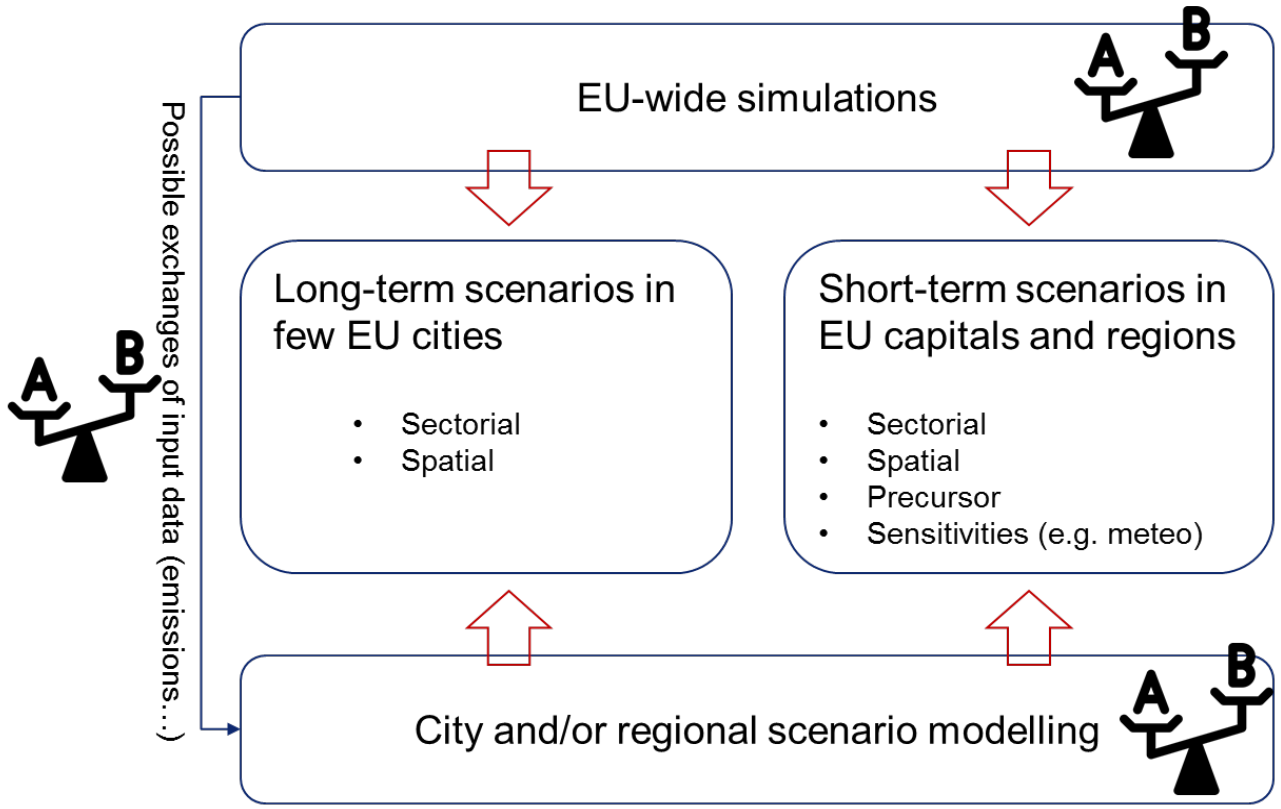
# CT9 Platform| structure




Fixed:
- 2015 for meteorology,
- Areas/domains for spatial reduction scenarios

This inter-comparison platform would allow:
- **understanding the variability** of models responses to emissions changes
- **guide member states/cities** in the application of emission reduction measures:

  - Model system vs model system (same/different scale)
  - Model vs model (with similar input data)
  - Model version vs. model version

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# The number of participants increased!

- Pawel Durka & Joanna Str., PL
- M. Stortini & Giovanni, ARPAE, IT
- Claudia Flandorfer & Kathrin, ZAMG, AT
- Christian Nagl, Umweltbundesamt, AT
- Nina Benesova, CHMI, CZ
- Ulas Im, ENVS, DK
- Maria Luisa Volta, UNIBS, IT
- Sonia Vidic, DHZ, HR
- Ranjeet Sokhi, UK
- Alexandra Monteiro, PT
- Alexander de Meij, Kees Cuvalier, JRC

## New participants

Cristina Guerreiro, NILU
Bruce Denby, MET Norway
Daniel Brookes, Ricardo UK
A. Megaritis, Patras, GR
Stijn Janssen, VITO
Angela Morabito, Sardenia, IT
Fernando Martin, CIEMAT
Mark Theobald, CIEMAT, SP
A Adamopoulos, YPEKA, GR
E Deangelis, UNIBS, iT
Rahela Zabkar, SLOVENIA
Ales Padro, TECNALIA
Stephan Nordmann, UBA, DE
Rafael Borge, UPM, SP
Eva Gabucio, GENCAT
Shyn Tong, DEFRA, UK
Laurence Rouil, INERIS
Laurent Menut, LMD
Ilaria delia, ENEA, IT
Mihaela Mircea, ENEA, IT
Antonio Piersanti, ENEA, IT
Luisella Ciancarella, ENEA, IT
Martijn Schaap, TNO
J. Matejovicova, SHMU, SL
Emilia Georgieva, BULGARIA
Guido Pirovano, SER, IT
Horvathz, SXE, HU
Eivind Wærsted, NORWAY
Jonilda Kushta, CY
Les White, Aeris Europe

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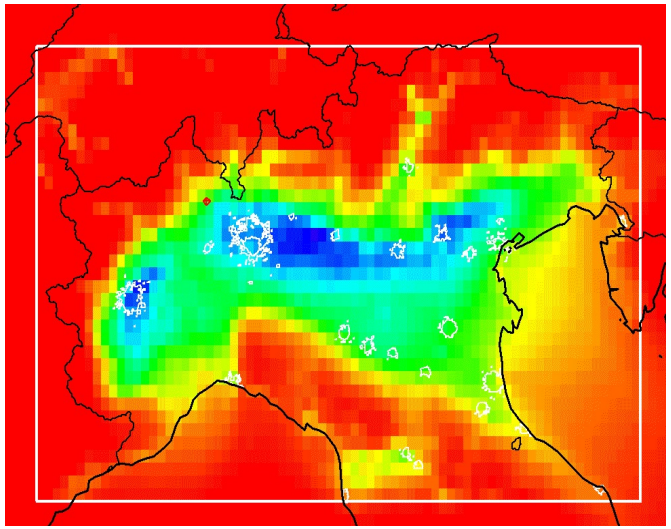
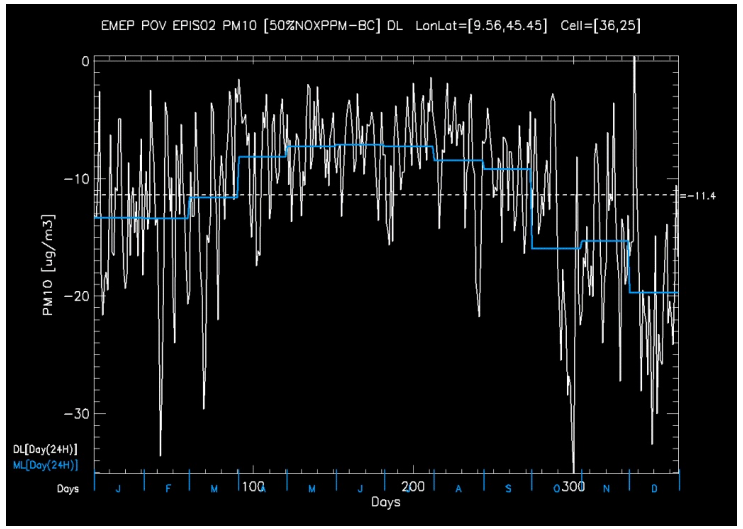
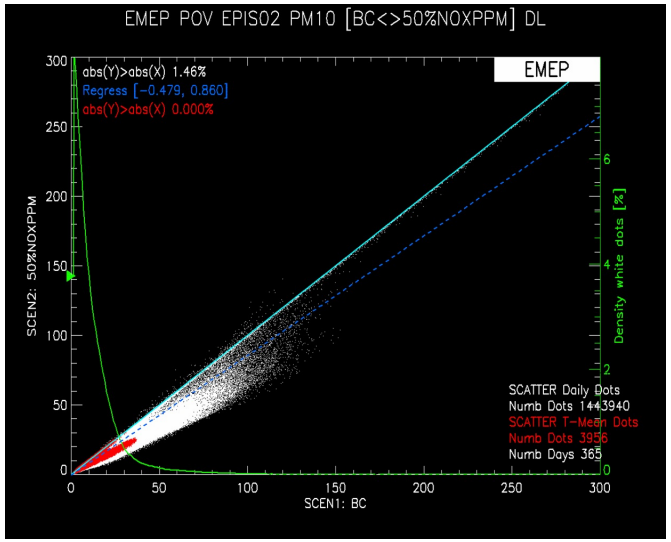
# CT9 Platform| participants update

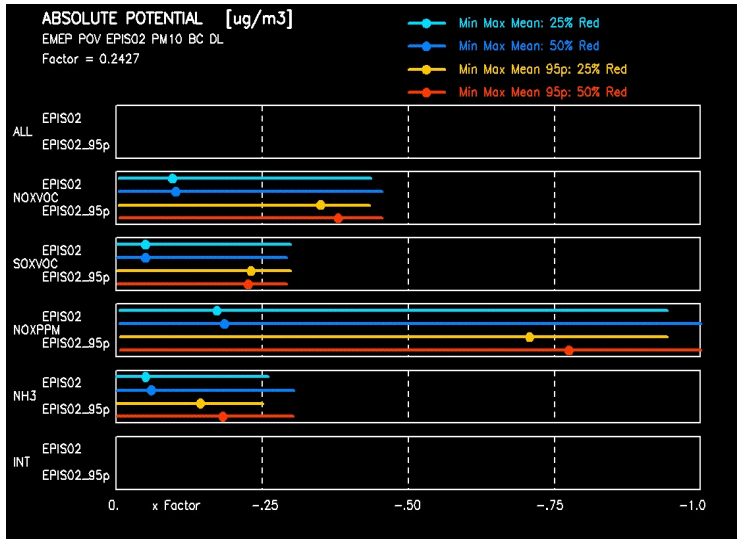
| Team name - Country | Model Name | Emission Inventory, resolution, date | Vertical distribution of emissions: Y/N | Wildfire emissions Y/N | Natural Emission model (VOC, NO, Sea salt) | Target area simulated (Cities, region, Europe) | Period of interest |
|---|---|---|---|---|---|---|---|
| JRC (EU) | EMEP | EDGAR V5.0, 2015 | Yes | No | Yes, in the model via other input | Europe, regions, cities | All Long-Term and Short-Term |
| JRC (EU) | EMEP | CAMS V2.2.1, 2015 | Yes | No | Yes, in the model via other input | Europe, regions, cities | All Long-Term and Short-Term |
| JRC (EU) | EMEP | EMEP - GNFR, 2015 | Yes | No | Yes, in the model via other input | Europe, regions, cities | All Long-Term and Short-Term |
| JRC (EU) | EMEP | CAMS REG V4.2 + Condensables 2015 | Yes | No | Yes, in the model via other input | Europe, regions, cities | All Long-Term and Short-Term |
| ZAMG (AT) | WRF-Chem | CAMS-REG 2015 | No | No | Yes, in the model via other input | cities (Vienna) | Short-Term |
| Met Norway (NO) | EMEP | EMEP, 0.1x0.1, 2015 | Yes | Yes | Yes, calculated in the model | Annual mean: BRU, BUC, | All long-term (annual mean only). |
| Met Norway (NO) | EMEP + uEMEP | EMEP, 0.1x0.1, 2015 | Yes | Yes | Yes, calculated in the model | Annual mean: BRU, BUC, ROM, BER, STO. Episodes: | All long-term (annual mean only). Episodes: Only 1.–9. January so far |
| CyI (CY) | WRF-Chem | EDGAR V5.0, 0.1° x 0.1°, 2015 | Yes | No | Yes, in the model via other input | Europe | Long-Term |
| NKUA (GR) | WRF_Chem | EDGAR HTAP, 2010 | No | Yes | Soil, sea salt on-line calculation | Athens city | Short-Term (EPIS016) |
| DHMZ (HR) | ADMS-Urban | Croatian National Emission Inventory for Zagreb | No | No | No | Zagreb domain as indicated in the CT9 document | All Long-Term and Short-Term, year 2015. |
| DHMZ (HR) | LOTOS-EUROS | CAMS-AP-v2.2.1 2015 | Yes | Yes | Yes, in the model via other input | Zagreb domain as indicated in the CT9 document | Entire year, 2015. |
| LMD/IPSL (FR) | WRF-CHIMEREv2020r1 | CAMS REG V4.2 2015 | Yes | No | MEGAN offline for NO and VOC + Sea salts | Europe, Paris | Short Term EPIS014 over Paris |
| UH-CACP (UK) | WRF-CMAQ | EDGAR V5.0, 2015 | Yes | No | MEGAN offline | Europe, UK, London | Short term PM and O3 episodes |
| CIEMAT (ES) | IFS-CHIMEREv2017r4 | EMEP + NEI, 2015 | Yes | No | MEGAN offline for NO and VOC + Sea salts | Europe, Spain, Madrid | 20150701 - 20150705 |
| ENEA (IT) | WRF-MINNI | ISPRA Italian national inventory 2015 | Yes | No | Yes, in the model via other input | Po Valley | Short-Term |
| UNIBS (IT) | WRF-CAMx | INEMAR 2015+EMEP | Yes | No | YES in the emissions input | Po Valley | Long Term |
| IRCELINE (BE) | CHIMERE + RIO + ATMOSTREET | Local inventories | Yes | No | Yes, in the model CHIMERE (MEGAN) | Europe, Belgium, Brussels | Long-Term and Short-Term |

# Visualization platform tool



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# CT9 Platform proposal | final notes

- The first phase of collecting modelling results finished last summer: we are happy to have **several models on board** (local/European scales)

- But we need to continue to populate the plataform!

- inter-comparison up to the street level → **later stage**

- Paper with the **first results**! – summer 2021 (start)