



New commitments to solve the air quality problems in Europe?

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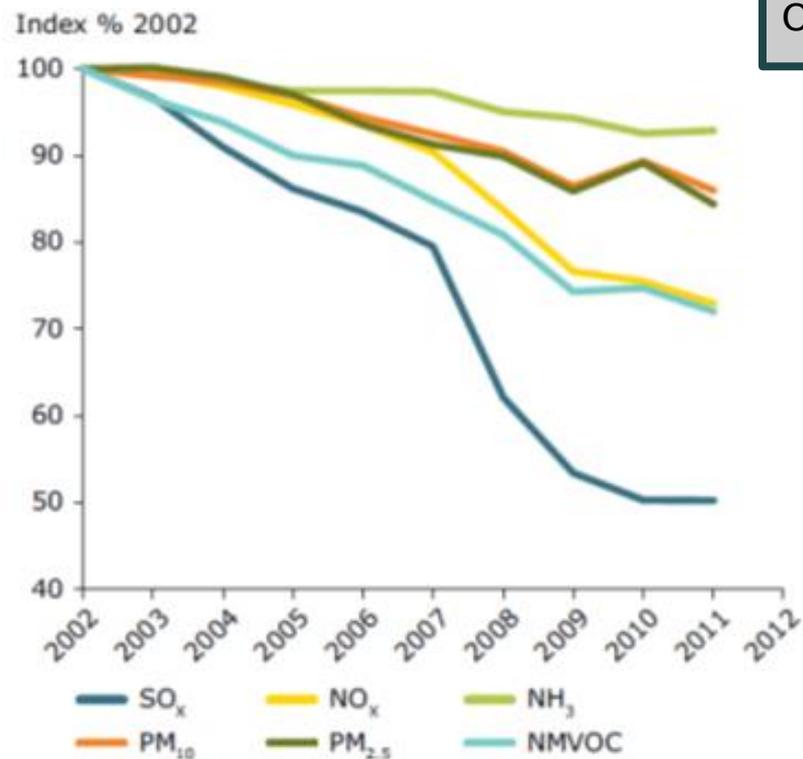
maîtriser le risque
pour un développement durable

Reducing emissions of air pollutants to reduce exposure....

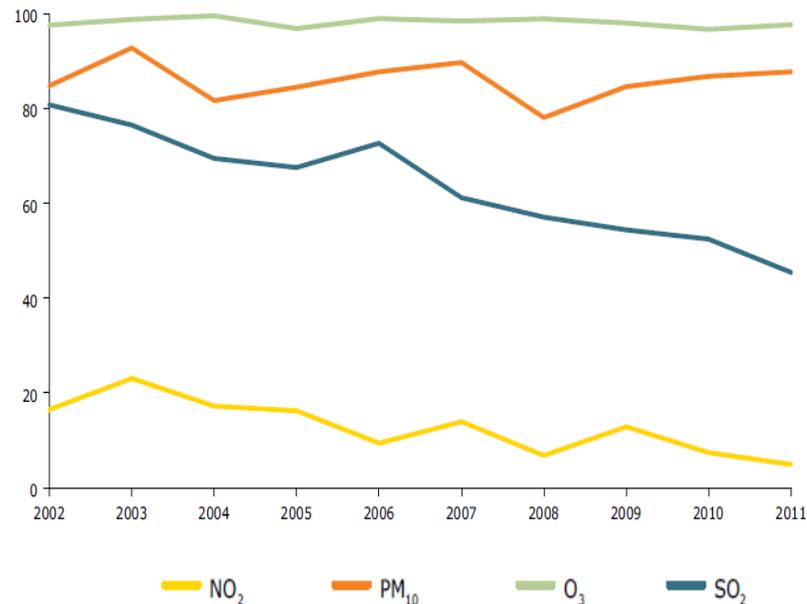
Emission reduction over the 10 past years

- NO_x and VOC (O₃ precursors) reduced by up to 30%
- Primary PM_{2.5} emissions reduced by 10-20%

The downward trend of the past 10 years in emissions of PM and O₃ precursors is not reflected in the observations



Emissions reduction relative to 2002 for the main pollutants and precursors

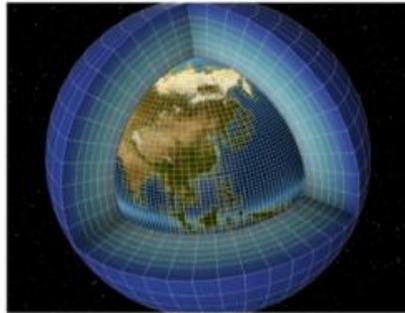


Fraction of the urban population exposed to air pollution exceeding WHO air quality guidelines

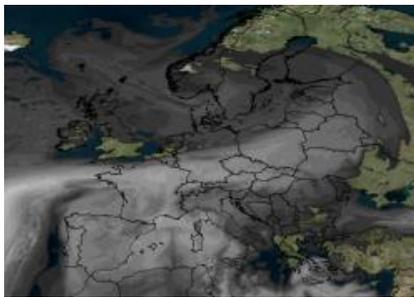
Source : EEA, (2013)

Chemistry transport models : to build up the link between emissions and concentrations

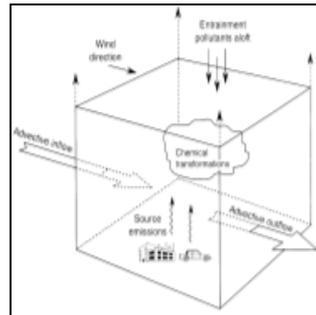
Global Chemistry Model



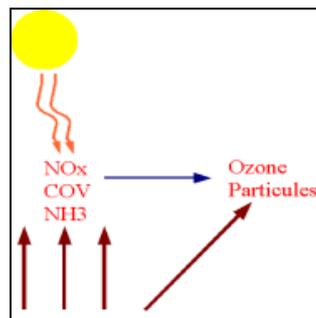
Regional Meteorology



Transport
Advection
Turbulent mixing
Deposition



Chemistry
Photochemistry
Aerosol formation

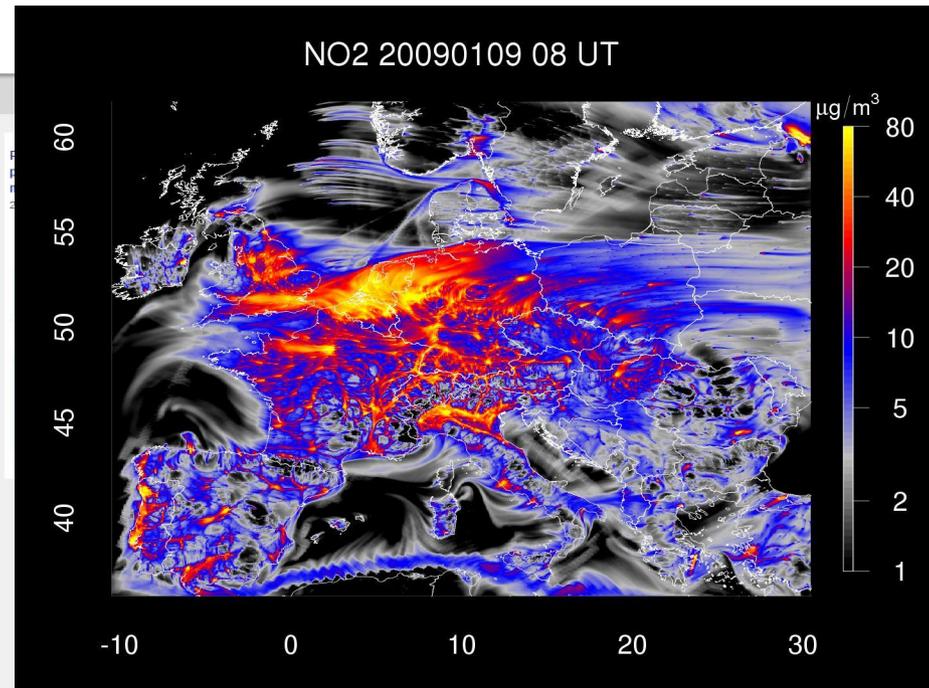
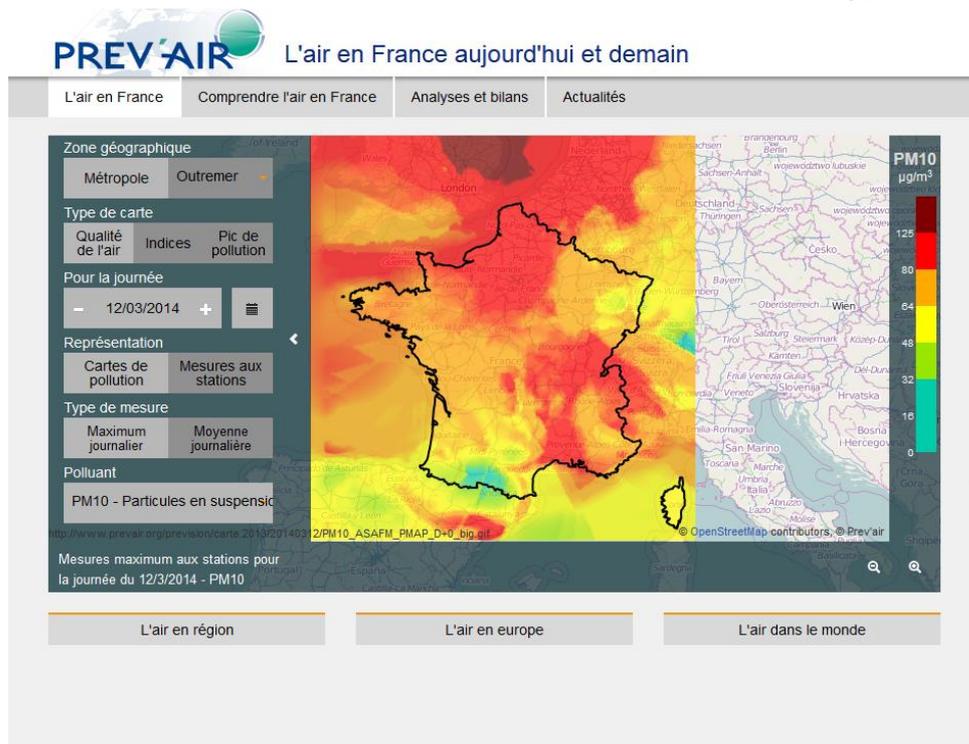


Emissions of Trace species



The CHIMERE model

- Developed by INERIS and the National Research Center since 2000 to simulate transport and chemistry of air pollutants in France and in Europe
- Huge research effort put by INERIS on aerosol modelling since 2002.
- Implemented in the **PREV'AIR system** : national air quality forecasting and mapping platform
- One of the models used within the **COPERNICUS atmosphere services** for air quality forecasting and modelling in Europe
- Used as a **tool to support decision making** to assess the efficiency of air emission control strategies (support to the French Ministry of Ecology)

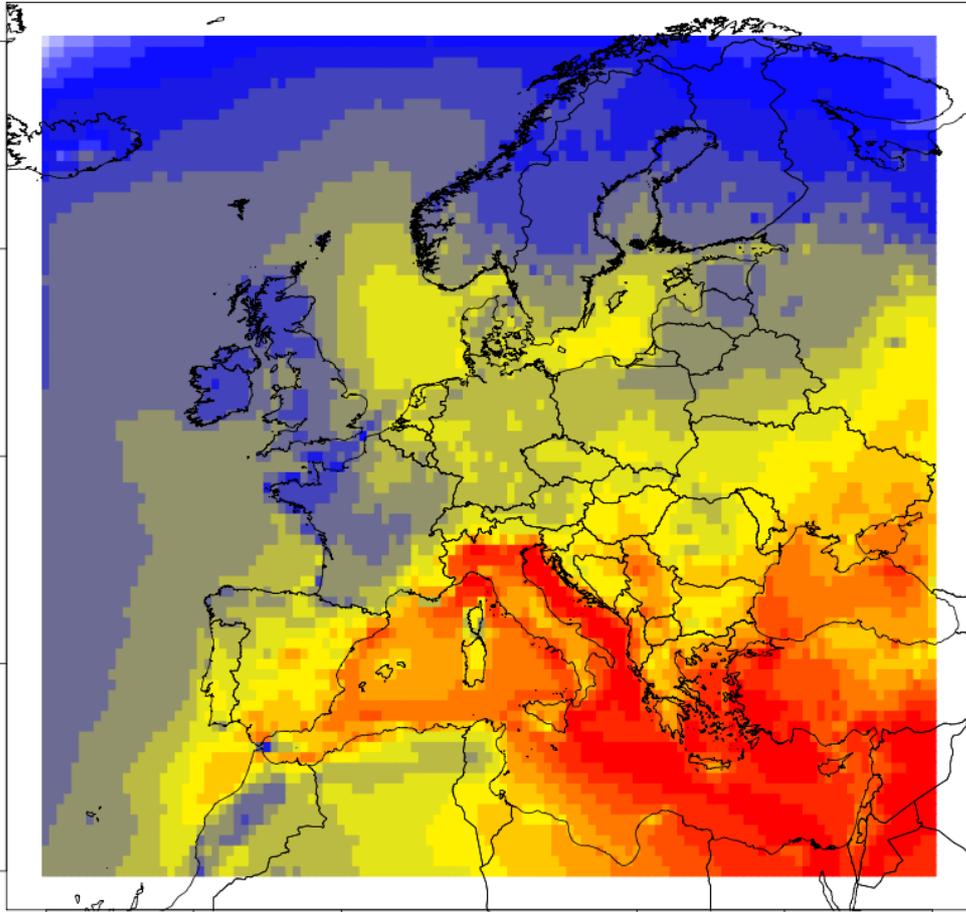


Modelling experiments to simulate the impact of the TSAP 2013 projection scenarios of air pollution (2030)

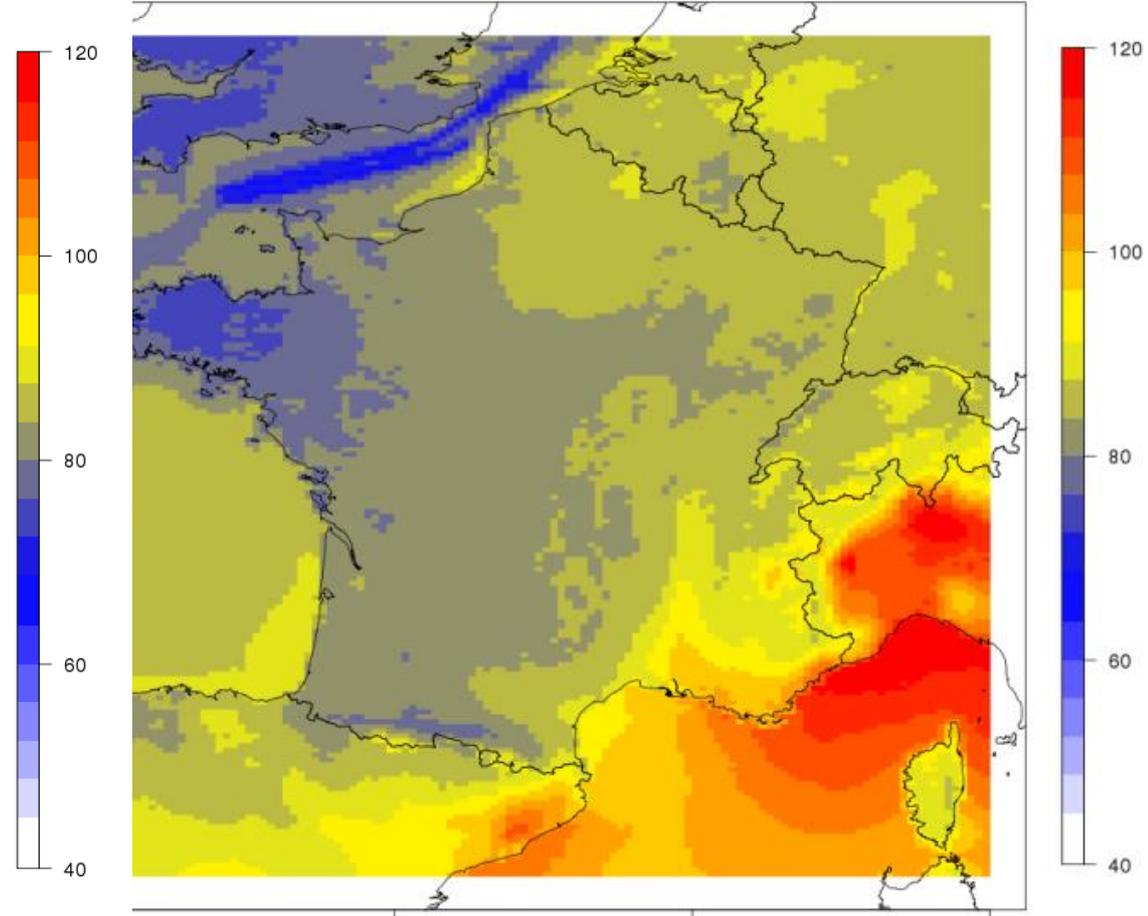
- Example : France
- CHIMERE runs
- Spatial resolution : 7km
- Emissions : MACC-TNO emission inventory with a revised geographic distribution based on accurate proxys
- Reference meteorological year : 2009
- Reference emissions year : 2005
- Scenario : TSAP2013 for the year 2030 (TSAP report #11)

Impact of the 2030 TSAP2013 scenario on ozone peaks (summer period)

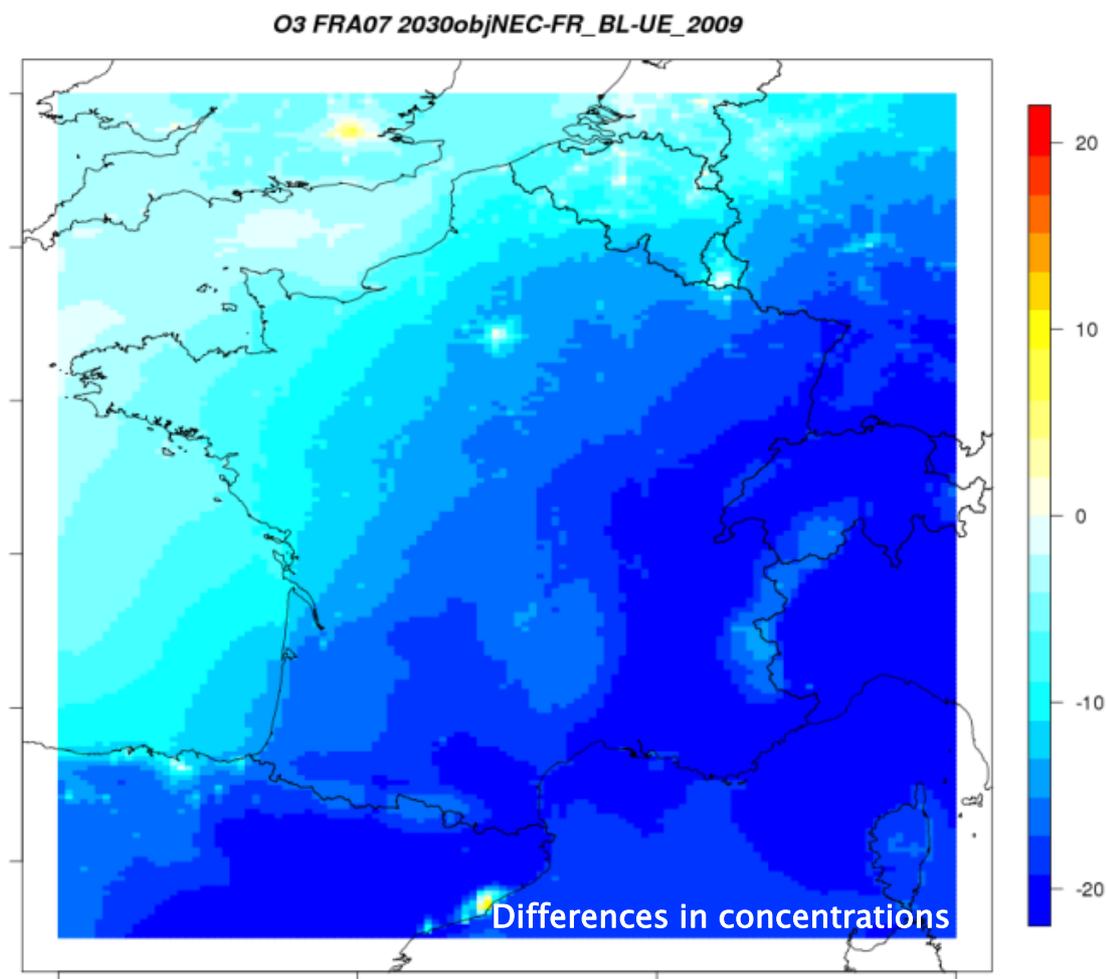
O3 MACC5es 2030objNEC-FR-UE_v1_2009



O3 FRA07 2030objNEC-FR-UE_2009

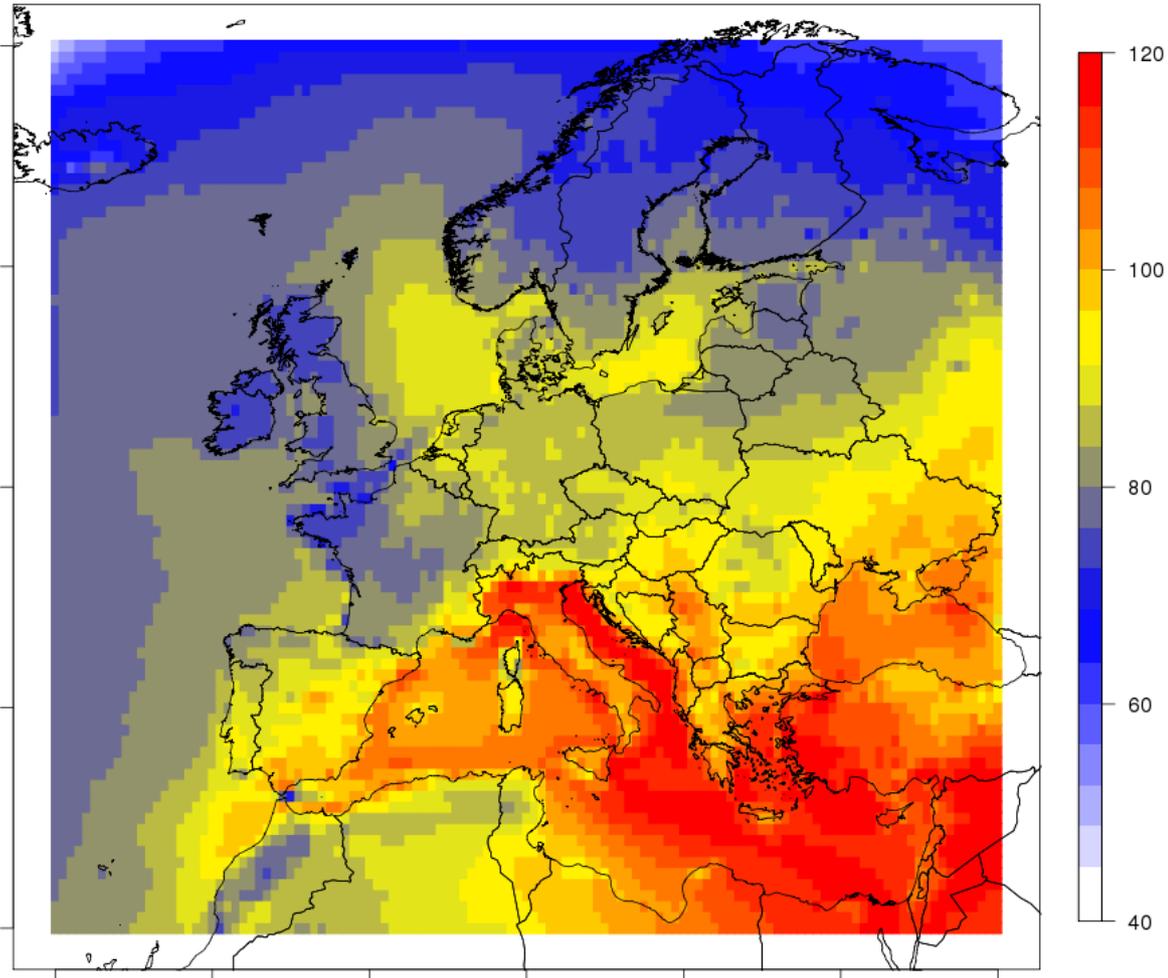


Impact of the 2030 TSAP2013 scenario on ozone peaks (summer period)



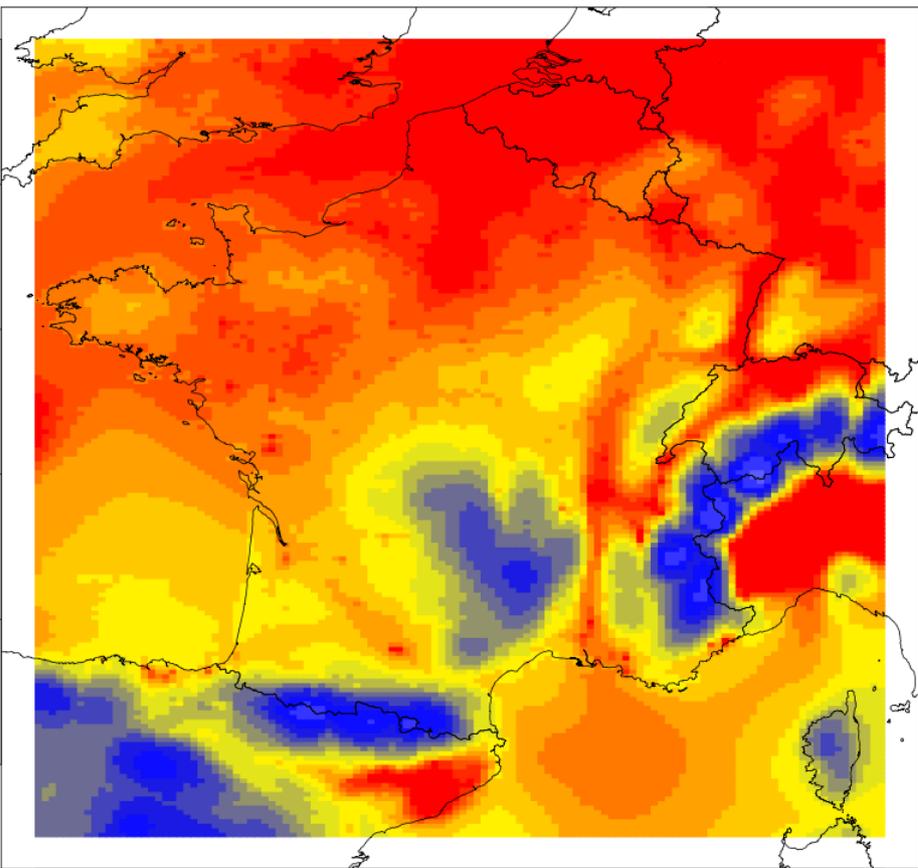
In Europe The mediterranean region will still be an issue

O3 MACC5es 2030objNEC-FR-UE_v1_2009

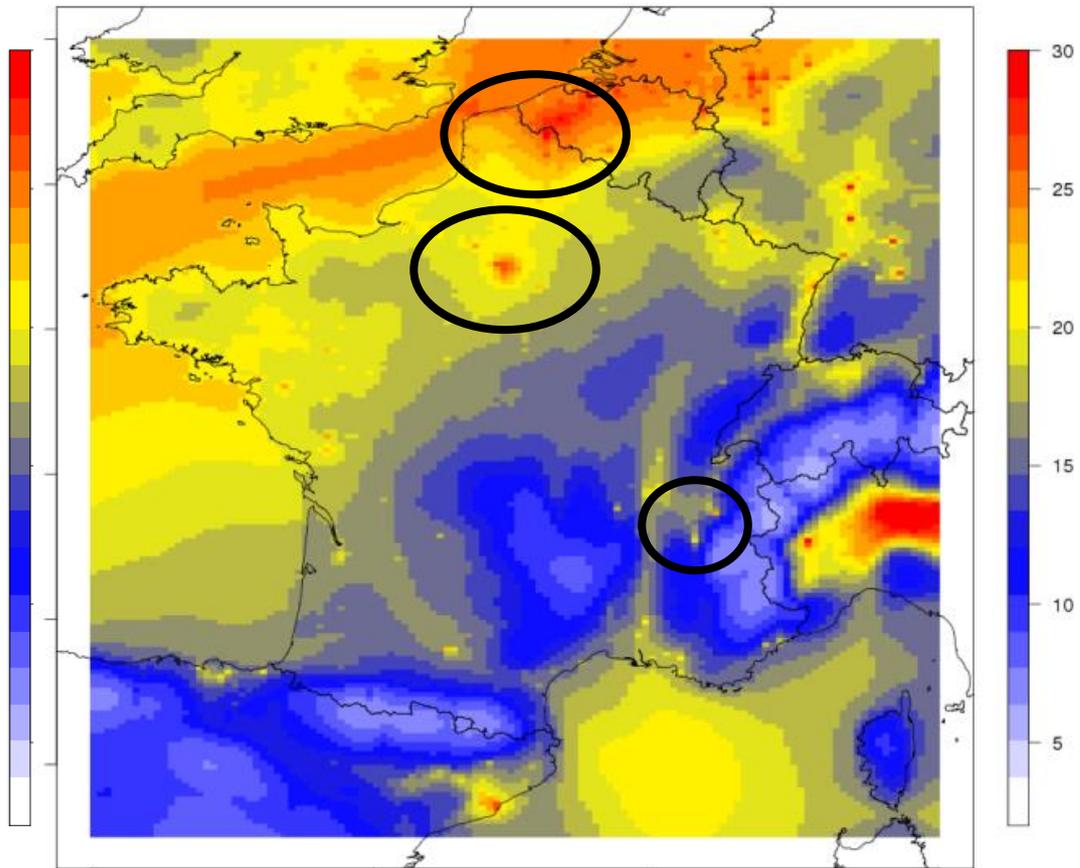


Impact of the 2030 TSAP2013 scenario on PM10 concentrations (annual mean)

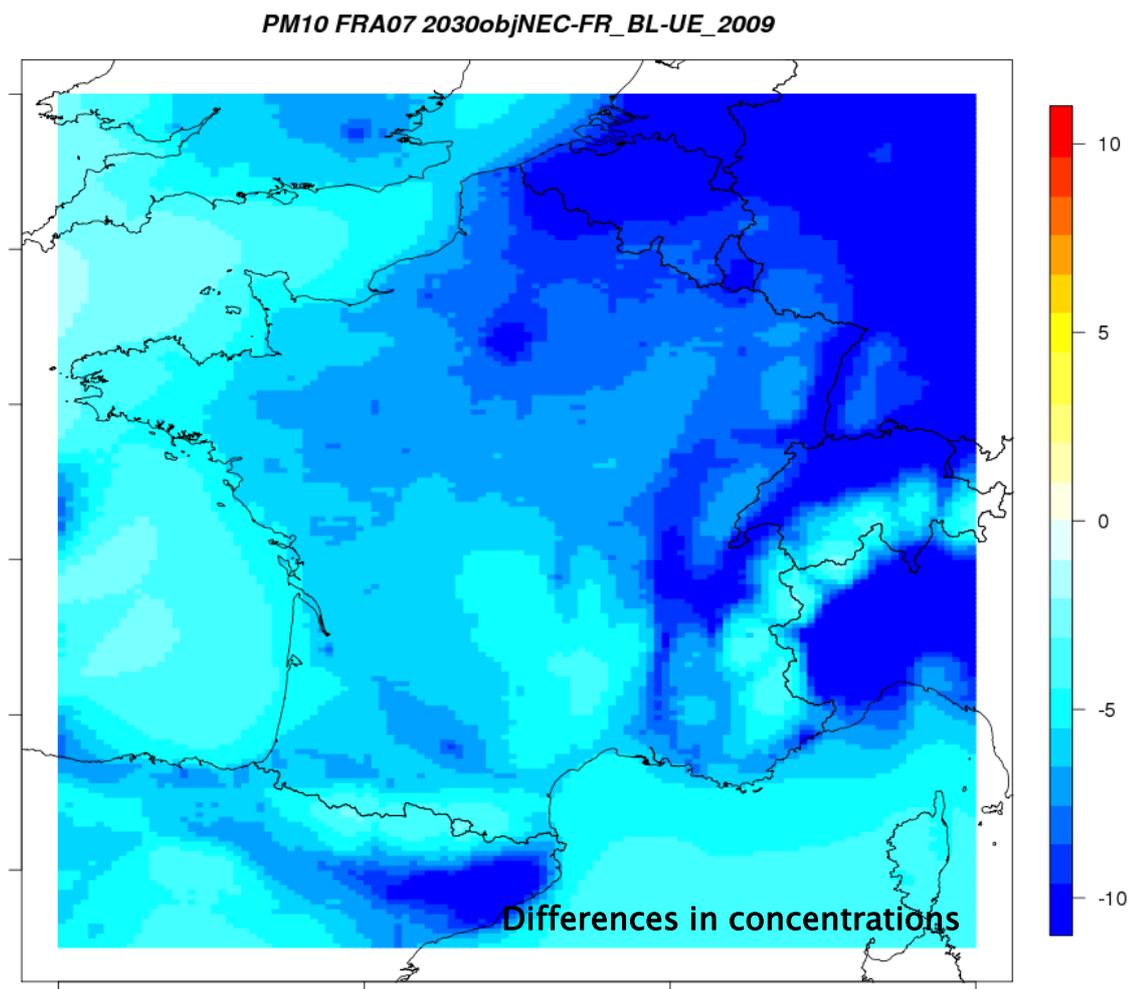
PM10 FRA07 2005BL-FR-UE_2009



PM10 FRA07 2030objNEC-FR-UE_2009



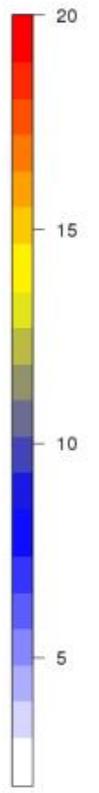
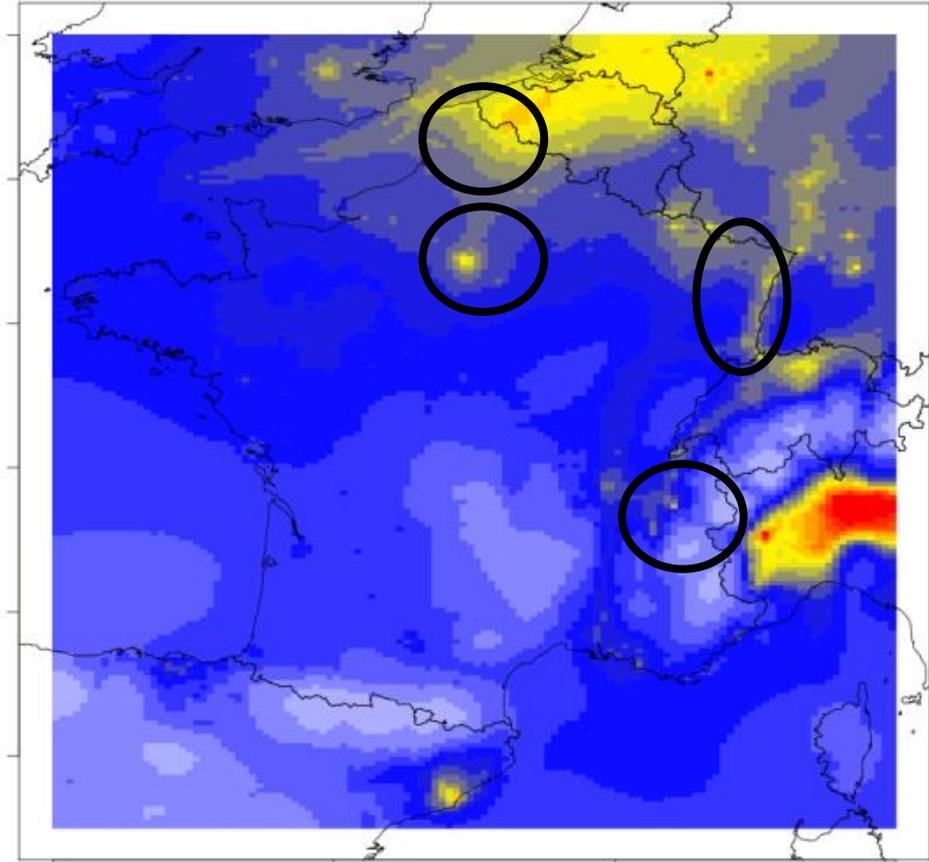
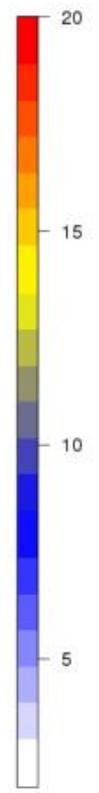
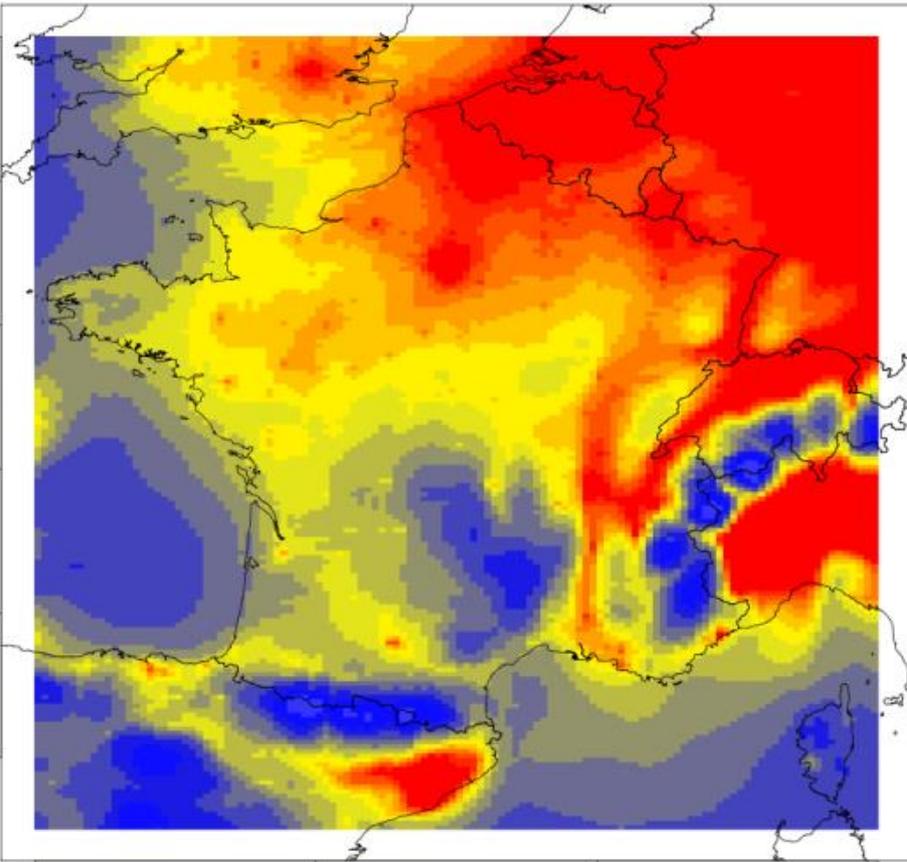
Impact of the 2030 TSAP2013 scenario on PM10 concentrations (annual mean)



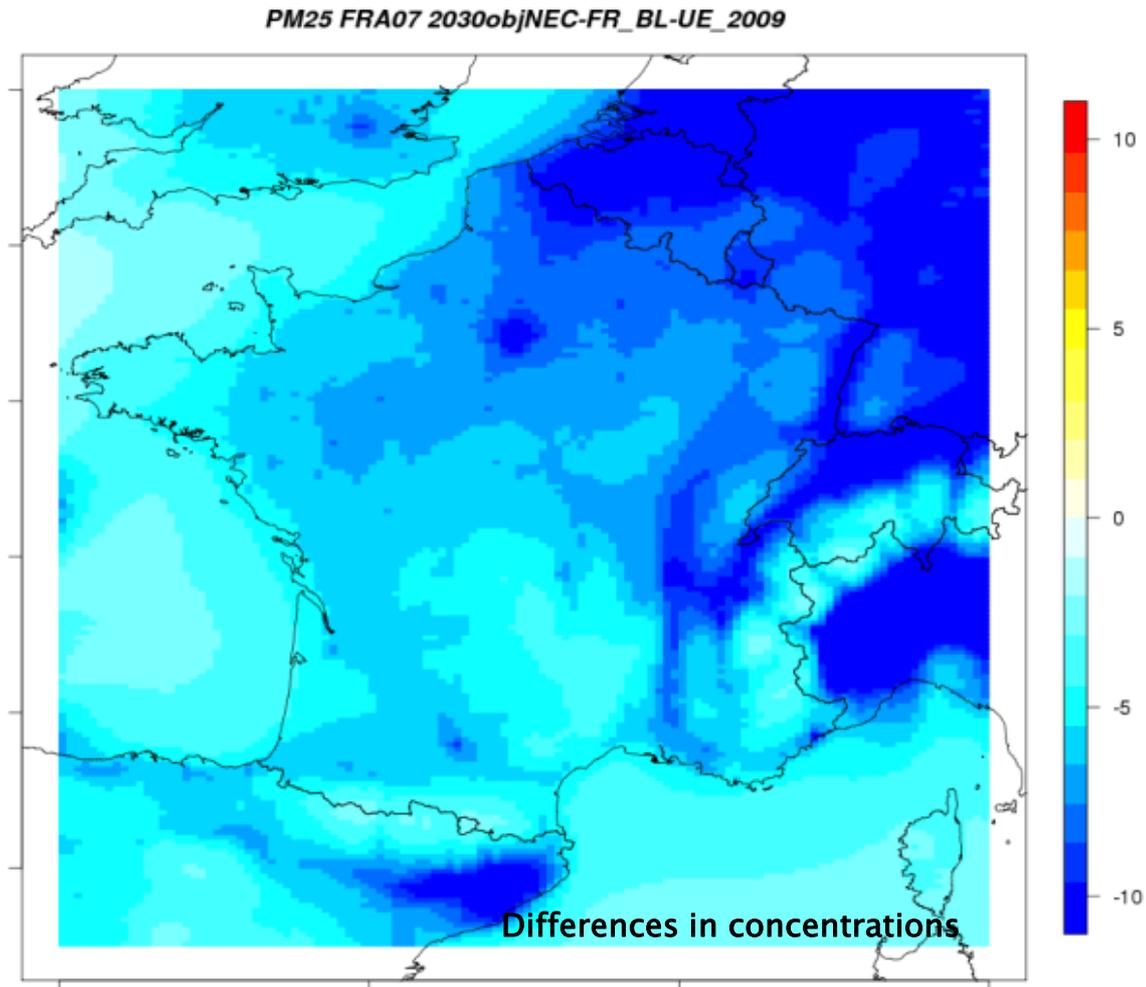
Impact of the 2030 TSAP2013 scenario on PM2.5 concentrations (annual mean)

PM25 FRA07 2005BL-FR-UE_2009

PM25 FRA07 2030objNEC-FR-UE_2009

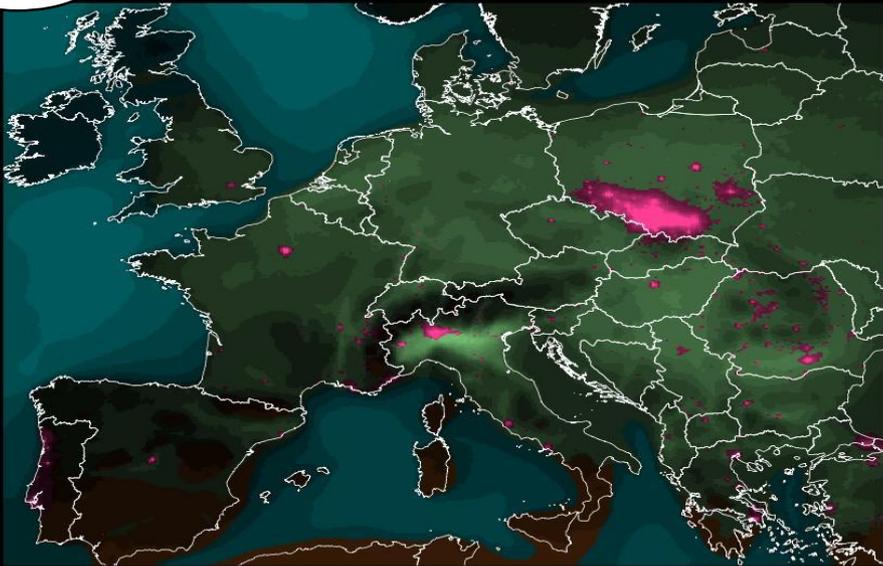


Impact of the 2030 TSAP2013 scenario on PM2.5 concentrations (annual mean)



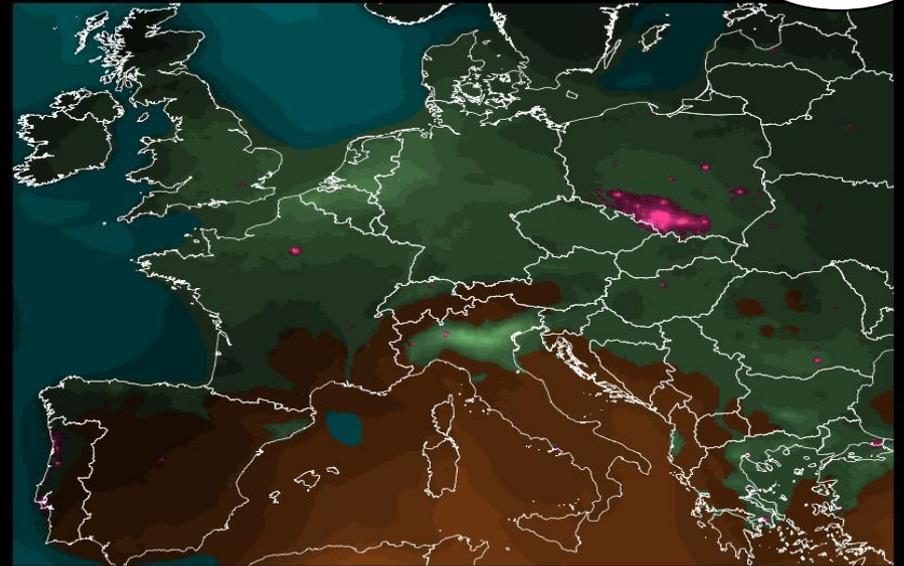
2009

DJF



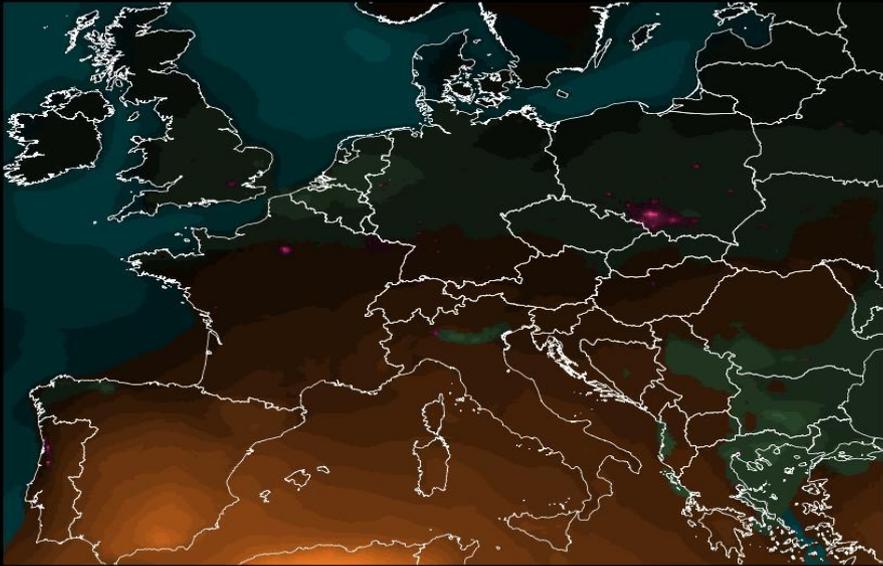
MAM

8 km

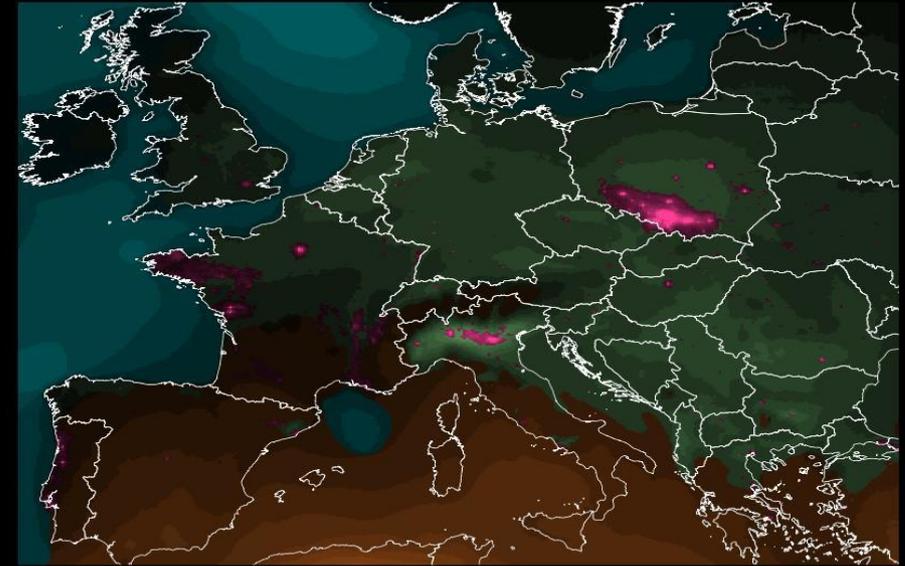


PM10 : Prevalent fraction : Sea Salt or biogenics (Blue) /
Anthropogenic secondary PM (Green) / Primary PM (Pink) / Dust
(Brown)

JJA

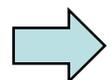


SON



Conclusions (part 1)

- Limitation of the titration effect in urban areas (where NO_x emissions are high) what will increase background ozone levels in those areas
- Ozone remains an issue in Mediterranean Europe
- A significant positive impact of future legislation on PM concentrations and exposure
- In France, some limited (urban) areas are still likely to have exceedances of limit/target values in Paris area, Nord Pas de Calais, Alsace, Rhone-Alpes, PACA

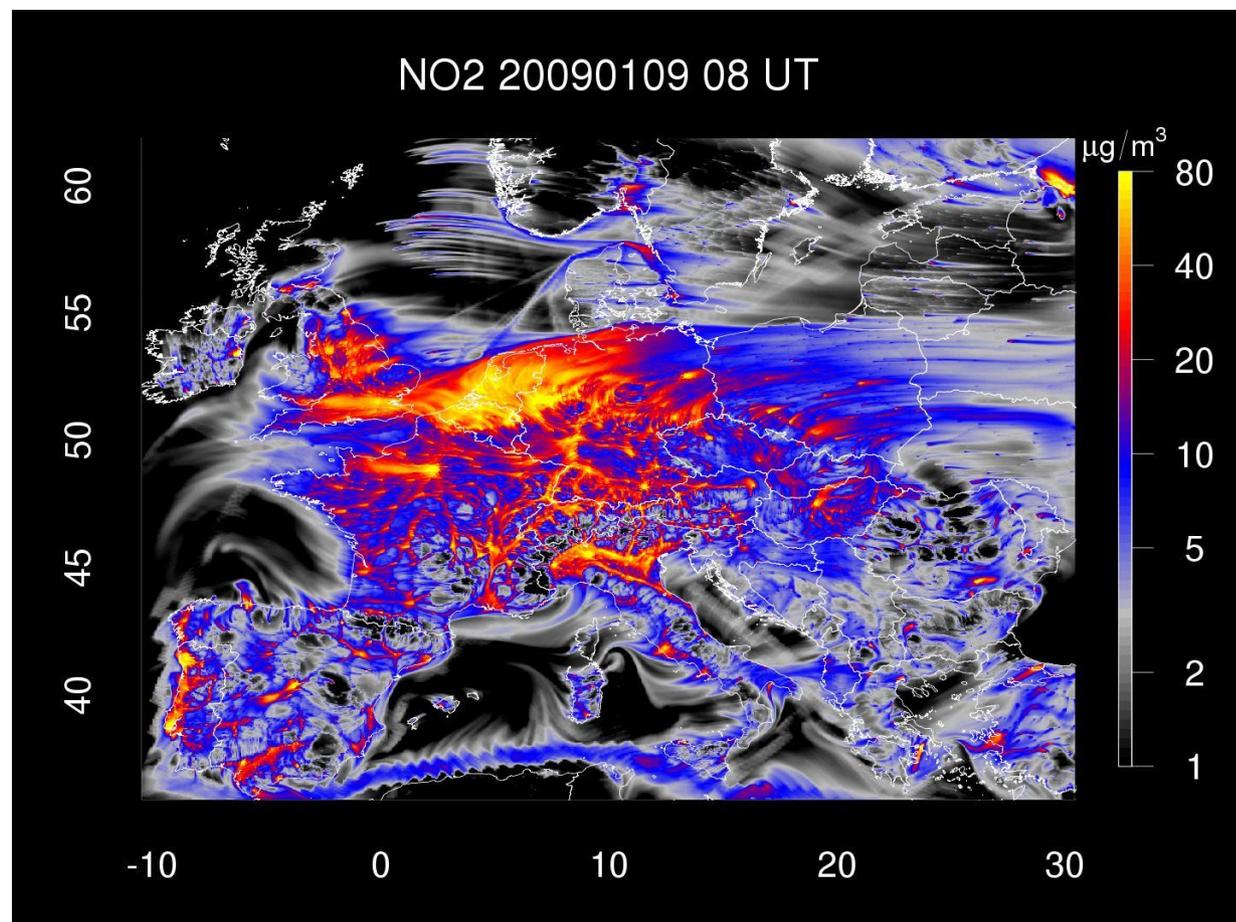


Additional efforts will be needed

- For Ozone, to limit the global influence (background)
- For PM (and NO₂) to fix local hot spots in the cities and in Benelux, Po Valley, Poland

Conclusions

- Remaining PM hot spots in terms of concentrations will mainly concern emissions “hot spots”
- Combining sectorial control strategies and local policies is essential
- Taking advantage from co-benefits with climate and energy policies (ozone)
- Promoting global efforts
- Reducing exposure
 - Raising awareness (local plans)
 - Construction regulation ?
 - Information to public (Forecasting-<http://atmosphere.copernicus.eu>)



THANK YOU FOR YOUR ATTENTION