

# Air4EU methods framework, case studies and Recommendations

- Air4EU main goals:

*‘ ...best practices for combined use of monitoring methods and models to assess AQ in Europe from local to continental level for various users from local to European level.....’*

and to:

*‘ prepare maps of AQ in Europe.....’*

# Objectives of the methods framework

- *to harmonise recommendations from the scale related deliverables, with the user requirements*
- *to take account of results from case studies to improve recommendations on ‘best practice’*

# Relevant items for a methods framework / structure

- **Objective** of the assessment => needs
- **Scale** of the assessment => reg/urban/local
- **Compound** PM, O<sub>3</sub> etc
- **Quality** of the assessment
  
- **Assessment methods:**  
monitoring, emissions, models,  
scale contributions, uncertainty assessment

**=> combination of monitoring and models**

# Topics of Air4EU Recommendations (derived from assessment needs)

- **Main topics:**
  - *Spatial assessment of Air Quality, as a basis for mapping of concentrations and exceedances, on*
    - *regional scale*
    - *urban scale*
    - *local scale*

# **Additional topics**

**(needs derived from Directives)**

- Assessment of source contributions
- Assessment of population affected
- Assessment of the PM<sub>2.5</sub> exposure indicator
- Scenarios and forward projections
- Information to the public

# Additional topics (needs of the cities)

## *Examples:*

- How to deal with dust suspension?
- How to take 2-wheelers into account?
- QA/QC of modelling
- How to clarify discrepancies between monitored and modelled levels and trends?
- ...

# Typical Table of contents for a Recommendation topic

Example of a Topic:

- ***Mapping of air quality on the urban scale***

1. Introductory overview text

2. Monitoring

- for mapping/ for model validation:

a) Network design

b) Monitoring methods

c) Data quality procedures

3. Emissions
4. Modelling
5. Larger scale contributions
6. Uncertainty assessment
7. Combination of monitoring and model data

*In each of the sections, we treat:*

- compounds*
- sub scales*
- assessment quality*

# Scales and sub-scales

- Regional scale:
  - *European, National/region, 'zone' scale*
- Urban scale:
  - *mega-city, typical agglomeration, regions of several cities, smaller polluted city*
- Local scale:
  - *single street/small network, city centre area, industrial area, single industrial plant*

# Quality of the assessment

## *Recommendations on:*

- Typical European practice (according to DD)
- Best practice
- Improvement of less advanced practices

# Air4EU Case studies

## What is the purpose of case studies:

- The case studies are intended to test and demonstrate the first recommendations made in Air4EU.
- To produce maps of air quality and their uncertainty
- Case studies will be used not just as validations but also as test cases for feedback into the recommendations.

## Defining case studies:

- Consultation between city and research partner
- Consideration of city needs and Air4EU recommendations
- Discussion and definition by all Air4EU partners
- Case study work plan and implementation

## Current status of case studies:

- Preliminary phase of defining case studies
- Current activity is consultation between cities and research partners
- Discussions within Air4EU consortium in regard to recommendations

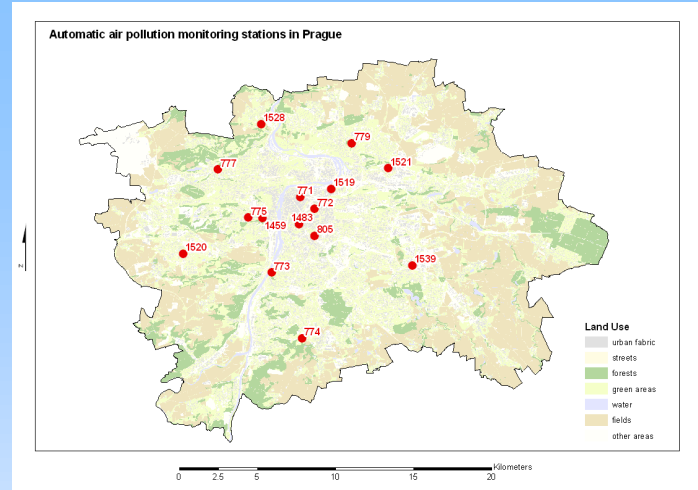
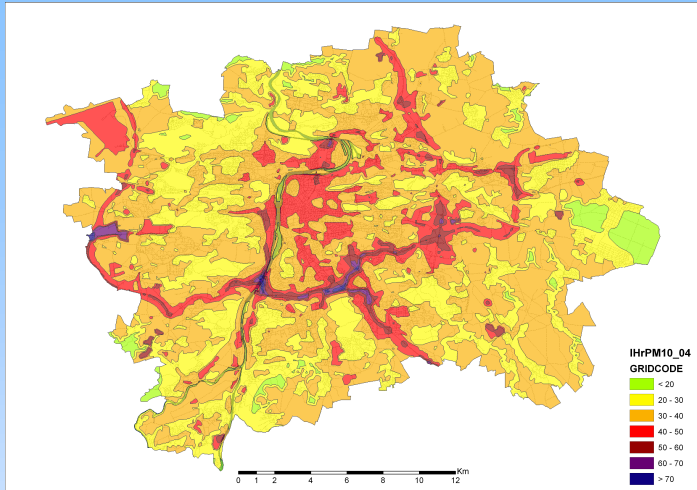
Case study progress		Sep 05	Sep 05	Meeting Oct 05	Nov 05	Meeting Apr 06	Jun 06	Sep 06	Oct 06
City partner	Research partner	Consultation	City assessment	Case study definition	Work plan	1st case study report	1st maps delivered	Final case study report	Final maps delivered
Oslo	NILU	May 05	Jun 05						
Prague	NILU	Apr 05	Jun 05						
London	UH	May 05							
Paris	TNO								
Rotterdam	TNO								
Rome	TNO								
Athens	AUT	Jun 05							

# Some suggested case studies



## Oslo:

- Use of data assimilation methods on the urban scale to:
  - improve assessment
  - assess network design and provide an optimal network for use of both models and monitoring
  - give uncertainty analysis
- Apply data assimilation to local line source model and measurements
- Show the effect of improved meteorological data (current met data is poor)

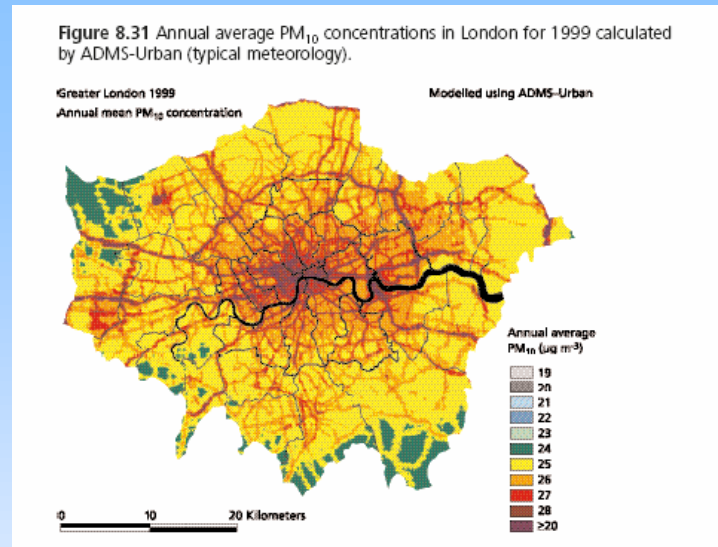


## Prague:

- Installation of AirQUIS system
  - apply data assimilation methods on the urban scale
  - compare to current model setup
- Application of PM resuspension model
- Apply simple combination techniques to the ATEM maps

## London:

- To analyse the air quality at a highly congested site with the OSCAR System
- Impact of traffic managements
- Use Models 3 to provide boundary and initial conditions for a local scale modelling – eg Models 3 and the OSCAR System



## Athens:

- Define the source contributions to  $PM_{10}$  in Athens
  - Regional background
  - Natural emissions
  - Resuspension
  - Street increments







# Air4EU Recommendations structure

- First level: **Topic** of the recommendation:
  - *the objective + the scale*
- Main topics:
  - *Spatial assessment of Air Quality (mapping of concentrations and exceedances) on regional, or urban, or local scale*

### 3. Emissions

- a) emission inventories (top down/bottom up)
- b) emission factors
- c) data quality procedures

### 4. Modelling

- a) model types
- b) input data requirements
- c) ...

### 5. Larger scale contributions

- a) assessment by monitoring
- b) assessment by modelling
- c) scale interactions between models/nesting

## 6. Uncertainty assessment

- a) accuracy and uncertainty of monitoring
- b) Model uncertainty

## 7. Combination of monitoring and model data

- a) Requirements for combining models/monitoring
- b) Simple methods for combining
- c) Data assimilation methods

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- assessment quality*