

COST 715

MINUTES OF THE MEETING OF WORKING GROUP 3 16 February 1999, Hamburg

Participants

Laszlo Bozo, Hungary
 Renato Carvalho, Portugal
 Jaakko Kukkonen, Finland
 Patrice Mestayer, France
 Rosa Salvador, Spain
 Alix Rasmussen, Denmark (not present)
 Guy Schayes, Belgium (not present)

The title of the action

The title should read "Meteorology during peak pollution episodes".

Management

WG is chaired by Jaakko Kukkonen and WG rapporteur is Laszlo Bozo.

Background

During episodes pollutant concentrations are highest, and at the same time the performance of dispersion models is commonly worst. European Union Directives require practical measures to be taken, if air quality limit values are exceeded.

Problems are different in cities of various European regions.

- (i) In Northern European cities ground-based inversions, stable atmospheric stratification, low wind speed and topography are key factors. Particles and NO₂ are the most important pollutants. Episodes occur typically in winter (NO₂) or spring (particles). In Northern and Central Europe, resuspension of particles from street surfaces is an important source of coarse particles.
- (ii) In Southern and Central European cities stable atmospheric stratification, low wind speeds, mesoscale circulation, topography and solar radiation are important factors. Photochemical pollution episodes including O₃, particles etc. occur commonly in summer.

Over whole Europe, low wind speeds and stable atmospheric stratification tend to cause episodes. Particulate pollution seems to be important in episodic conditions over whole European continent.

Objectives of the WG

1. Define the scope of work in more detail:
 - define a peak pollution episode
 - allow for specific conditions in various European regions
 - evaluation of regional air quality is needed in many cases, but the work aims to focus on episodes in urban areas
2. Review of available measured and processed meteorological and concentration data.
3. Modelling of episodes:
 - review of available models
 - testing and validation of available models
 - analyse the main factors causing uncertainties in model predictions:

- meteorology, chemistry and emissions.
4. Evaluate practical matters related to episodes:
 - analyse the evolution of past episodes in the light of measured and predicted data
 - evaluate exceedances of guidelines and limit values
 - analyze the influence of measures in order to control episodes

State-of-the-art in the participating countries

Monitoring

Urban and regional monitoring is carried out in cities of all participating countries. Relevant meteorological data is available for most participants. The meteorological soundings are commonly available only at a few locations. Measured vertical concentration data is scarce.

Modelling

The models applied vary widely in the participating countries. A variety of models are being developed or are already available in case of episodes in some countries:

- urban and regional scale dispersion models, including photochemical schemes and mesoscale atmospheric re-circulation (past episodes)
- air quality forecasting (AQF) models (future episodes)
 - based on results from NWP (numerical weather prediction) models
 - statistical (semi-empirical or empirical) models
 - neural network models

Both dispersion models and meteorological pre-processing models are often unreliable in meteorological conditions prevailing during an episode. In many countries, AQF models are not available.

Model testing and validation in the course of an episode is very scarce. Systematic validation of dispersion modelling and AQF in the case of episodes is needed.

Work plan for the next few months

- (i) Each country will prepare a Status Report including the following items, within 2 months: main objectives, available meteorological and concentration data, available models, expected benefits, and funding situation and related other projects. The chairman and rapporteur will circulate more detailed instructions within 2 weeks.
- (ii) The chairman and rapporteur will prepare a draft work plan (based on these minutes) and circulate it via e-mail to participants, for their comments.
- (iii) Participants will contact persons outside the Management Committee, and encourage the relevant scientists to join in the WG.
- (iv) An internet home page could be created, in coordination with the chairman of the COST action.

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