

## **Workshop on Model Uncertainty Analysis Methodology**

organised by the European Topic Centre on Air Quality on the occasion of the 6<sup>th</sup> 'Model Harmonisation' Conference, Rouen, France, 12 October 1999

### **Workshop Report**

The European Topic Centre on Air Quality (ETC-AQ) aims at improving the knowledge base for models and at providing guidance to any model user in the selection of the most appropriate model for his application. As a first step, ETC-AQ stimulated the documentation of models in the Model Documentation System (see web page <http://aix.meng.auth.gr/database/index.html>).

In addition to an adequate documentation, model users normally wish to obtain information on the uncertainty associated with a specific model, especially if the latter is to be employed in the frame of policy oriented air quality assessments. ETC-AQ is therefore encouraging model validation activities, and towards this aim it was decided to include in the Model Documentation System information related to model evaluation (participation at model validation activities, comparison against reference data sets etc.).

As a matter of fact, even the results of a perfect model may be uncertain: Errors in input data lead to model output uncertainties. These uncertainties together with those related to the model insufficiency constitute the overall uncertainty of a modelling study. If a model is to predict specific 'target output' values, i.e. for checking whether or not air quality standards are met, it is of particular importance to assess the uncertainty range at which these values result from the overall modelling study.

In the light of the above, on the occasion of the 6<sup>th</sup> 'Model Harmonisation' Conference in Rouen, ETC-AQ organised a Workshop on Model Uncertainty Analysis Methodology with emphasis on modelling studies included in air quality assessments. Specific aims of the workshop were:

- Discussion on the methodology proposed by ETC-AQ (see below).
- Identification of policy issues for the application of this methodology
- Definition of steps towards applying the methodology to various models and several situations for selected policy issues.

ETC-AQ's methodology for analysing the uncertainty of modelling studies included in air quality assessments was the subject of an oral presentation during the conference (see proceedings). The discussion during the workshop allowed defining in more detail the individual steps of the methodology:

1. Definition of the 'target output' value for the modelling study and identification of the corresponding limit value.
2. Agreement on the situations to be treated by the model.
3. Collection of the necessary input data.
4. Specification of input data uncertainty ranges.
5. Selection of sensitivity analysis method to be applied.
6. Performing the uncertainty analysis.
7. Assessment of target output uncertainty range.
8. Derivation of input data quality objectives.

There was wide agreement among the workshop participants both on the suitability of the methodology and on its applicability to various policy issues. Among other the following issues were mentioned in the discussion:

- Urban ozone
- Short-range dispersion
- Air pollution in street canyons
- Long-range transport
- Particulates
- Heavy gas dispersion

As a prerequisite for the application of the methodology it was agreed that for each policy issue a working group should be formed, preferably representing a larger modellers' community. Apart from inviting modellers to participate, this group should steer the overall uncertainty analysis and inform ETC-AQ on the progress. The Topic Centre would then disseminate in a harmonised way non-confidential results for each policy issue.