

PROCEEDINGS

Ninth EIONET Workshop on Air Quality Management and Assessment Oslo 22-23 November 2004



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Front page picture

Workshop participants in front of the building of the Norwegian Pollution Control Agency in Oslo.

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SUMMARY

The 9th EIONET workshop on air quality assessment and management took place on 22-23 November 2004 in Oslo. The meeting was chaired by Jaroslav Fiala, EEA, and Frank de Leeuw, ETC/ACC. The workshop covered a broad range of issues as reflected in the agenda.

The sessions of the first day covered air quality data reporting to the European Commission and EEA, tools for information exchange and access to the data, and AQ indicators. Andrej Kobe of DGEnv presented AQ data reporting requirements from the Directives, needs seen from the CAFE programme, and the work in the newly formed Data Exchange Group (DEG). Sheila Cryan of EEA presented the Reportnet software and system, which provides improved possibilities for easy data transfer to the EEA data depository. The status of the EoI2004 reporting cycle was then presented, being quite successful in that all 31 EEA Member Countries had reported the data by the time of the workshop. The feedback and completion process is in progress. Suggestions on how to improve AQ data exchange were given, for the various reporting processes (Exchange of Information, monthly reporting following the ozone directive). AirView3, giving possibilities to get in an easy way AQ information from the web, was presented, also thoughts about how the quality of the data in AIRBASE could be improved, as well as how to further develop the real-time ozone web presentation hosted by ETC/ACC.

Hans-Guido Mücke from WHO presented results from the APHEIS project (re. health impact assessment of air pollution) as an example of how data from AIRBASE can be used, and improved. Latest developments on EEA Structural Indicators (SI) were presented, as well as AQ indicators used in the UK.

The second day presented results from various AQ assessments and projects carried out by ETC/ACC (the AQ part of the *State of the Environment and Outlook report*, the Street Emission Ceilings project (SEC)), as well as presentations on the EU-research project AIR4EU on assessment methodologies and on Europe-wide AQ mapping methodologies. Presentations were also given on the EEA contributions to the CAFE Working Groups on Target setting and Implementation.

Conclusions from the general discussion at the end of the workshop were:

- The program at this 9th workshop seems to have been too heavy on the assessment part, and that not enough time was allocated to the more technical issues of data transfer, data quality etc.
- The workshop planning committee for the 2005 workshop will contain two country representatives (from UK and Cyprus). It is important that the workshop program is planned better around the present needs of the EIONET participants, and that their role in workshop is better defined.
- It is also important that the program and agenda be set in good time before the workshop, and that workshop material, including extracts of presentations, be distributed well before the workshop.

After the workshop, a common session with the parallel EMEP TFMM workshop was held, with the topic *Air Quality monitoring strategies in Europe*.

The scope of the session was to discuss improvements in the AQ monitoring efforts in Europe, to highlight the main AQ monitoring needs and requirements, and to discuss the development of a strategy which will support a harmonisation of objectives of all main activities.

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Participants of the 9th EIONET workshop on Air Quality Management and Assessment, Oslo, 22-23 November 2004 (Photo: Patrick Tisserant)

INTRODUCTION

The presentations and background documents at the workshop can be found at this link: http://air-climate.eionet.eu.int/meetings/past_html. The presentations have been summarised in the sections below, and selected examples of slides and pictures are used to highlight some of the issues presented. Please consult the slides in the web link above for details of the presentations.

Discussions, questions and answers are also summarised. (Questions and discussions related to clarifications of certain points in the presentations are not included in this summary).

Opening of the meeting

Rob Swart (ETC/ACC)

Rob Swart welcomed the participants to this workshop. Looking backward Rob briefly summarised the major achievements of the Topic Centre since the 8th AQ EIONET workshop held in 2003:

- The finalisation of a number of reports (“Air Pollution in Europe 1990-2000”, the Ozone 2004 report which has been submitted to the Commissions, the final report on the first phase of the *Street Emission Ceiling* project which focussed on air quality at hot-spot locations). In addition various reports related to air emissions and climate change have been published. All reports are available from the ETC/ACC website (<http://air-climate.eionet.eu.int/reports>),
- The upload of the EoI-2004 submission is in progress. This year increasing attention will be given to the quality of the data. A new version of AirView has been launched.

Various topics to be discussed in more detail during the workshop.

Welcome, scope and goal of the meeting

Jaroslav Fiala (EEA)

Participants were welcomed to the 9th EIONET Workshop on Air Quality Management and Assessment. As for the previous meetings, this meeting was organised together with the meeting of the EMEP Task Force on Modelling and Monitoring. This year, the two meetings were held in parallel, with a common session in the afternoon of the final day of the EIONET workshop.

The adopted agenda of the workshop and the common session is included as Annex 1 to this report.

The scope of this 9th EIONET workshop was to:

- Look at the latest developments with respect to air quality reporting and information exchange, and the streamlining of this process,
- Present recent work on European AQ assessments and on air pollution indicators,
- Present the contributions of the EEA and ETC/ACC to the CAFE program.

The goals of the common session with EMEP’s TFMM meeting were to discuss:

- The main requirements behind the various AQ monitoring efforts in Europe,
- The development of a strategy which will support a harmonisation of all main activities carried out within the various networks, i.e. EMEP, EEA and WHO.

The main air pollution related priorities of the EEA's 5-year strategy, which underpins the AQ assessment and management activities of EIONET and ETC/ACC, are to support work towards assessment of:

- Progress towards targets (emissions and AQ), and of policy effectiveness,
- Local air pollution and exposure, including hot-spot exposure (especially traffic related),

as well as improving the data collection and reporting to AIRBASE, and the quality of the data reported. This activity should provide the AQ data and information needed for EEA's crosscutting assessments like the State of Environment and Outlook reports (next is the SoEOR2005 report), the Environmental Signals Reports and the TERM Reports (Transport and Environment Reporting Mechanism).

This activity again underpins one of the main general priorities of the EEA, which is to develop further its environmental information system, the main features of which are:

- The Reportnet data reporting facility for Member States' use (see below),
- A shared European system for spatially related information,
- A "geo-portal" providing access for anyone to this information,
- A "neighbourhood" feature of this portal giving access to near-real time environmental data and information for any European location.

To satisfy the information needs of EEA's main clients, regular feedback from the EIONET community is needed. To get this feedback is one of the objectives of the annual EIONET workshops. The participants were urged to participate actively in discussions, with this objective in mind.

SESSION IA: AIR QUALITY REPORTING

EU Air Quality Reporting: Status/requirements on reporting on DDs, and Data Exchange Group.

Andrej Kobe (DG Environment)

The focus of this presentation was:

- Daughter Directives (DD) related reporting requirements, especially for new Member States and their time schedule. For the new Member States reporting obligations apply only after accession. Therefore, the first (mandatory) submission of the questionnaire on the Daughter Directives (2004/461/EC) is by September 2005 (on 2004 data). It is recommended that new Member States report over a full year although it is enforceable after May 1 only.
- Review of the 2004 reporting results. 2004 was a difficult year for the "reporters" due to the late availability of new reporting templates. Nevertheless, there was a very good response.
- Details related to the electronic reporting possibilities.
- The Data Exchange Group (DEG) and its relation to EoI and EIONET.

Issues which were mentioned as important regarding data reporting included the need for links between the DD-related reporting and EoI reporting, such as:

- a consistent use of the EoI-station code in the DD-Questionnaire in order to link the station meta-information available in AIRBASE,
- the importance of standardisation in monitoring methods, and documenting equivalence of other methods,
- the need to harmonise/couple the various data reporting streams and reconcile the needs of the receiving institutions (DGEnv, EEA, ETC/ACC).

The Data Exchange Group (DEG) was established during last fall, and had its first meeting on 11 November 2004. The DEG is chaired by the Commission, participants are from the Member States, EEA, ETC/ACC and DGEnv, with the purpose “*as an expert technical group to assist DGEnv, supported by EEA and ETC/ACC, in its effort to ensure efficient reporting by addressing the technical issues involved*”. The Terms of Reference of the DEG reflect this objective.

Current issues discussed within the DEG include:

- All MS should be considered DEG members,
- The field of work presently is limited to the reporting under the EU legislation,
- Detailed issues related to EoI/AIRBASE reporting, DEM etc. are important in order to improve both completeness and ease of reporting,
- Need for data providers to focus on data QA/QC,
- Linking of station codes (local/national/EoI,...),
- The need to provide non-mandatory data items to improve the usability of the AQ data. This includes e.g. station classification and representativeness data, as well as population data.

In the discussions it was pointed out that the relations between EIONET and DEG needs to be delineated.

EEA support of European Environment Reporting-Reportnet

Sheila Cryan (EEA)

European Environmental Reporting involves many groups of people with different tasks:

- Data definers
- National Data suppliers
- Data collectors
- Information providers
- Information users.

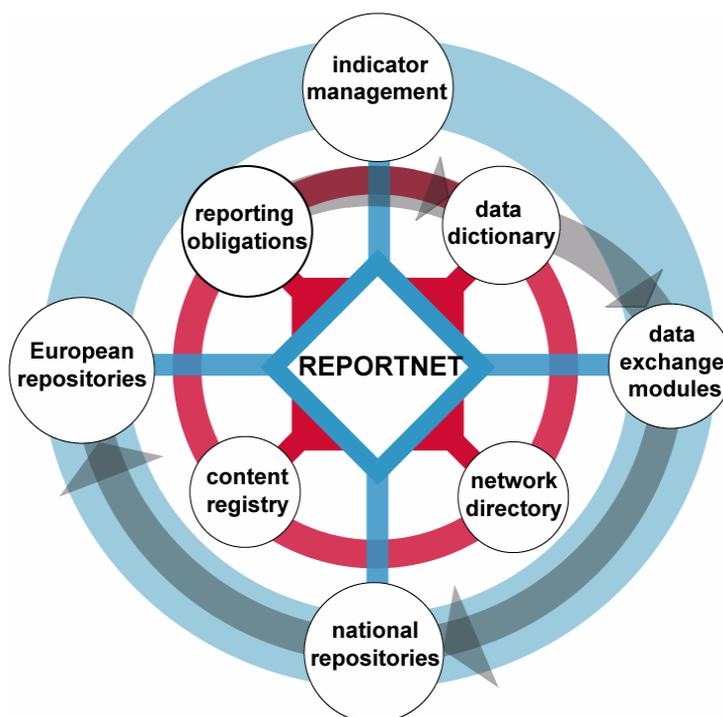
To facilitate the reporting cycle, EEA started the development of Reportnet.

Objectives behind Reportnet are to develop and maintain a system which serves the needs of all these groups.

For a description of Reportnet it is referred to the presentation (see web-link in the introduction) and <http://www.eionet.eu.int/rn/click>, see also the figure below, giving the Reportnet structure and its elements.

In this presentation the various items of Reportnet was briefly touched upon:

- the 2 “tracks” of Reportnet: Technical (electronic infrastructure and tools for streamlining flows of environmental information in Europe) and Organisational (business process reengineering (BPR) of reporting processes started August 2004),
- Reportnet as an electronic infrastructure and related tools,
- the integrated “Reporting Obligations Database” (ROD). The ROD provides information on what, how, when and by whom information should be delivered,
- The Data Dictionary (providing more detailed information on “what and how to report”, overview for MSs),
- Network Dictionary (“who is who” in the reporting networks, e.g. NRCs),
- Data exchange Modules (DEMs), the 1st generation reporting tools,
- Data Repositories (National and European), providing the sites for actual data deliveries for the data deliverers,
- Contents Registries, providing a view of what has been reporting by MSs.



Reportnet work in progress in 2004 includes:

- development of Generic DEM (GDEM) mechanisms,
- indicator management service (IMS), providing specifications for EEA's core indicators,
- improved user interfaces,
- advanced data handling functions.

The GDEM is a modular framework for handling of reporting with focus on XML. There will be 4 data upload mechanisms (web browser, Specialised application, System-to-CDR delivery, Web questionnaire), as well as automatic quality assessments and feedback, data conversion possibilities and tools for building a data flow.

Discussion

Q.: The central repositories has clear advantages. However, what are the advantages of the GDEM, when will it be ready?

A.: The development of Reportnet is kept in manageable steps. The ROD and Data Dictionary are now developed. The GDEM is now operational for groundwater reporting. The system is developed by the EEA but NFCs are involved in the user group.

SESSION IB: INFORMATION EXCHANGE AND ACCESS TOOLS

EoI-2004 data submission, EoI Report, Status, use of DEM transmission, Processing EoI Reports

Patrick van Hooydonk/Wim Mol (RIVM-ETC/ACC)

The EoI-2004 data submission and processing procedure (concerning data for the year 2003, carried out during the autumn of 2004) has been rather successful, as a result of the combined effort of the countries and the ETC. All 31 EEA Member Countries had reported data by the time of the workshop, and by the time of the deadline (1 October), more than 80% of the countries had reported. 28 countries used the latest DEM version for reporting, all uploading the data on the Central Data Repository (CDR). 6 countries resubmitted additional historic data.

At the time of the workshop, data from 26 countries had been uploaded into AIRBASE (see table below), and preparations were made for uploading of German, French and Spanish data, who don't use the DEM for accepted reasons. Feedback to countries on data quality and outliers is in preparation.

Overview 2004 EoI Reporting (Air Quality data of 2003)						
Status since: 17-11-2004						
Country (#)	Date EoI data arrived at ETC/ACC	Initial upload to AirBase for QA/QC checking	Date QA/QC report sent to country	Date country reply to QA/QC report	End date processing data and statistics into AirBase (***)	Remark
Alpha-2 Short name						
AL Albania **						
AT Austria *	17-09-04	14-10-04				
BA Bosnia-Herzegovina **	06-09-04	12-10-04				
BE Belgium *	28-09-04	26-10-04				
BG Bulgaria	29-09-04	05-11-04				
CH Switzerland **	30-09-04	09-11-04				
CY Cyprus *	15-10-04	09-11-04				
CS Serbia & Montenegro **						
CZ Czech Republic *	30-09-04	13-11-04				
DE Germany *	30-09-04					
DK Denmark *	30-09-04	13-11-04				
EE Estonia *	15-09-04	19-10-04				
ES Spain *	26-10-04					
FI Finland *	01-10-04	15-11-04				
FR France *	01-10-04					
GB United Kingdom *	27-09-04	18-11-04				
GR Greece **	28-09-04	05-11-04				
HR Croatia **						
HU Hungary *	01-10-04	16-11-04				
IE Ireland *	28-09-04	16-11-04				
IS Iceland	18-11-04					
IT Italy *	19-10-04					
LI Liechtenstein						
LT Lithuania *	28-09-04	05-11-04				
LU Luxembourg *						
LV Latvia *	30-09-04	13-11-04				
MK FYR of Macedonia **	01-10-04	15-11-04				
MT Malta *	01-10-04	16-11-04				
NL Netherlands *	24-09-04	27-10-04				
NO Norway	12-10-04	19-11-04				
PL Poland *	28-09-04	03-11-04				
PT Portugal *	01-10-04	17-11-04				
RO Romania	05-10-04	18-11-04				
SE Sweden *	01-10-04	17-11-04				
SI Slovenia *	30-09-04	13-11-04				
SK Slovak Republic *	14-09-04	19-10-04				
TR Turkey						

* EU 25 country
 ** Non EEA 31 country (others are EEA 31 country)
 (***) Data not yet available via website (AirView)
 (#) ISO3166-1 codes: Alpha-2 element and Short Name

The feedback process is very important in terms of secondary data checking, identification of possible problems and erroneous data, in order to improve the quality of the data in AIRBASE. The evaluation of this feedback process on last year's EoI reporting (2002 data) was generally positive. 26 outlier reports have been sent to

the countries. 50% of countries responded within 1 month, and in 15 cases identified problems were confirmed and corrected.

One special problem is the one of phantom stations, that is, stations for which no air quality data but only meta-information is stored in AIRBASE. Before the next EoI reporting (2004 data) the intention is to remove all phantom stations and otherwise update AIRBASE as requested by the Member Countries.

The time schedule for uploading the EoI-2004 data is as:

- By 1 January: data checking and upload reports to the Member Countries,
- By 1 February: feedback from Member Countries,
- By 1 March: finalise EoI 2004 data uploads.

Discussion

It is suggested to delete the phantom stations when no reply is received from the data suppliers. The meeting agrees with this proposal. As mentioned phantom station will not be deleted when a Member State wish to retain the station.

Q.: Both Germany and Belgium indicated that handling of (large amounts of) meta-information is a time-consuming process.

A.: The ETC/ACC answered that in the next version of the DEM (to be issued in July 2005) an option to import/export large amounts of meta-information in the form of excel-spreadsheets will be examined.

Q.: There seems to be an inconsistency in the number of station delivered to the ETC and the number of stations retrieved from AIRBASE.

A.: All data received by the ETC/ACC is stored in AIRBASE, so numbers should be the same. In the upload/outlier reports the number of stations per pollutant are listed. Please check those numbers and contact us in case of any difference. While analysing the data, frequently additional criteria, e.g. a data coverage of 75%, are applied. In the reports this may result in a lower number of stations.

How to improve AQ data exchange: Experiences, problems, suggestions, EoI procedure

Libor Cernikovsky. (CHMI-ETC/ACC)

EoI data exchange

DEMv7 was released via Internet only which saved a lot of manual work and time.

Only a few data suppliers asked for delivery on CD-ROM delivery. Based on this experience future versions of the DEM will be released via Internet only.

DEMv7 is nearly without important bugs and the DEM manual was updated which resulted in reduction of helpdesk contacts. Most of the questions/problems concerned uploading data to CDR/FTP-site even it was tested carefully.

Countries were encouraged to use the EIONET Central Data Repository (CDR) for data delivery. Nevertheless, EU Member States need to notify the Commission by e-mail that their data has been delivered to CDR.

Main problems found during the EoI-2004 upload cycle:

- consistency of all delivered meta information,
- completeness also means that all relevant stations as specified in Article 3 of EoI Decision are included in the reporting; especially in a number of new MS and Candidate Countries monitoring networks involved so far in EoI data transmission do not meet requirements of AQ directives as regards to component, spatial and population density coverage.

Important notes:

- New quality control routine was implemented in DEM, should be used by data suppliers to check the data quality.

- do not use old versions of DEM !
- do not use the same DEM database twice !
- do not modify DEM database using other software !

Suggestions:

- an earlier DEM release will be beneficial; nevertheless, most of the data suppliers start with DEM in September, the number of questions and advice requests increased during September and culminate around data delivery deadline,
- support to use DEM in new countries,
- organisation of a DEM/AIRBASE workshop with a hands-on training how to import (meta) data, and how to use various QA/QC tools to avoid mistakes in delivered data (timing: around June when DEMv8 is available).

Ozone data exchange

The year 2004 was the first year with data exchange under Directive 2002/3/EC. New reporting forms and guidelines are available on the ETC ACC web pages at: <http://air-climate.eionet.eu.int/databases/o3excess> and should be strictly used. Monthly information received from countries is published on the same page regularly.

A provisional report on summer ozone levels based on transmitted April – September data for the Environment Council meeting in October should be prepared in mid October and the final report should be ready in mid November. The deadlines are very tight and therefore only data delivered in time could be incorporated in the reports.

Important notes:

- the data used for monthly reporting and for the summer report are provisional, non-validated data,
- all values are to be expressed in $\mu\text{g}/\text{m}^3$; the volume must be standardised at the following conditions of temperature and pressure: 293 K and 101,3 kPa,
- the time is to be specified in Central European Time,
- data should be delivered to EIONET CDR, EU Member States need to notify the Commission by e-mail that the data has been delivered to the CDR.

Main problem in preparing the ozone summer report is the lack of clarity or missing data in the meta-information of stations: it is huge work to link exceedances information with station meta data (using all available sources, i.e. last year(s) ozone and EoI data reported).

A lot of small mistakes were found in transmitted data files. To correct all - although small - mistakes before/during data processing is very time consuming.

Summary of problems:

data reporting:

- the data delivery to EIONET CDR should be used without duplicate delivery via e-mail, the instruction of EIONET helpdesk should be followed,
- the folder “European Union (EU), obligations“ for data delivery should be used,
- correctness of XLS data files:
- use file even if no exceedance was observed - do not send only e-mail or upload text file (letters) do not use MS Word or HTML formats,
- do not write any information in tables Alert and Information in case no exceedances – write it in table on Comment sheet,

- use correct names of files for each month,
- do not use one monthly file for delivery exceedances information from more months, use separate updated file in this case,
- do not forget to report exceedance of information threshold in case of reported alert threshold exceedance,
- report only one 8h value per day, i.e. maximum 8h value, not all values exceeding 120 µg/m³,

data completeness:

- several stations are missing in the station list, but 8h- and 1h-exceedances and 1h maximum data were delivered,
- not for all stations mentioned in the station list monthly maximum 1h-values are delivered,

station's info:

- do not repeat the list of stations every month, report only information on new station(s) on Station sheet, information about stations which are not longer operational on sheet Comment. It is recommended to send the complete list of stations operational during the summer season April – September on sheet Station in summer summary file (most of countries did it this summer),
- use only recommended format for geographical co-ordinates: do not use format 19°36'32'' or degrees, minutes and seconds in separate columns,
- use correct abbreviations for Type of ozone station as defined in Directive 2002/3/EC, Annex IV: U= urban, S= suburban, R= rural, RB= rural background,
- do not use national characters (alphabet) in station's names,
- use the same identification for the same station every month: do not deviate names of stations, codes etc.; if it is needed due to reorganization of networks, please, update all previously transmitted monthly files
- use the EoI station code for station identification.

Comments/suggestions on EIONET CDR

- countries do not use uniform names for ozone monthly folders,
- separate folder for each monthly file is not practical: it will be better to use only one folder for each summer,
- it is very time consuming to download all reported files by clicking in all monthly folders and download file by file; the possibility to download zipped folder is not useful because there is mainly only one file in the monthly folder,
- CDR search engine should be improved: it is not possible to search for group of obligations and countries; the result of the search is the list of folders – the possibility to display the list of files in folders with possibility to download selected files together will be very useful,
- e-mail notification to data users when the file is uploaded will be useful.

Discussion.

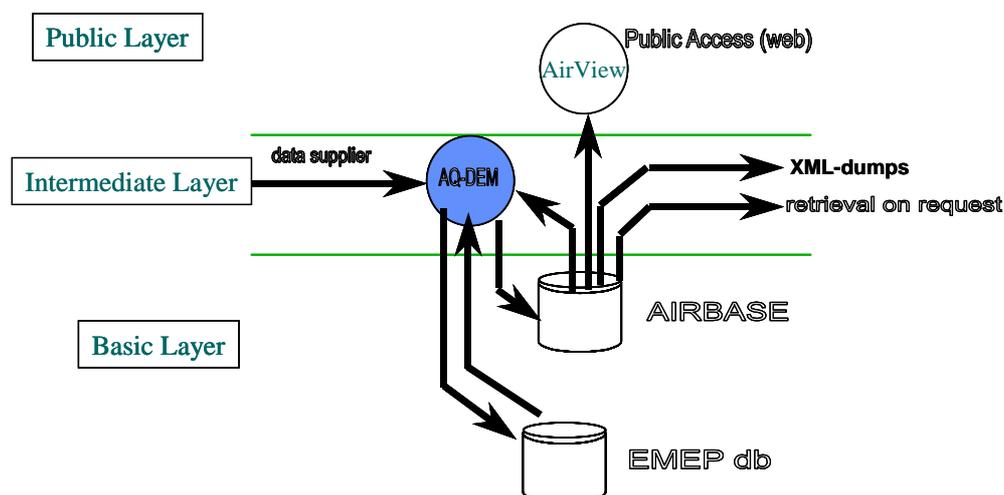
Q.: Spain noted that Spanish data are not included in the ozone report.

A.: The deadlines for production of the ozone report are very tight. Data received after the reporting deadline (31 October for the provisional data over the summer period) can not be included in the report. This year, 4 MS were not able to deliver data in time.

Information on Air Quality on the web: AirView 3

Wim Mol (RIVM-ETC/ACC)

The AIRVIEW web-application has been developed to give the general public interested in environmental issues a tool to interactively query the AIRBASE database and visualise air quality monitoring results as tables, graphs or maps. AIRVIEW's position in the well-known 3-layer data base structure of AIRBASE is shown in the figure below.



AIRVIEW 3.0 has now been developed, and is described and can be viewed at <http://air-climate.eionet.eu.int/databases/airview.html>

The 3.0 version has some added functionalities:

- - More output possibilities
 - save tables in cvs- or xml-format
 - tables with meta data,
 - tables and graphs with raw data, more statistics, exceedances
 - maps with more statistics and exceedances.
- Link to EEA map service Tool.

XML dumps containing all information stored in AIRBASE data are now available, see <http://air-climate.eionet.eu.int/databases/AirBaseXML.html>.

The ETC intends to make some macros available to facilitate the access of the dumps in excel.

Discussion

Q.: I have looked at the XML-dumps but I find it difficult to work with it.

A.: We realise that the dumps are rather complex. But we see no other solution to make the AIRBASE information available. The dumps contain nearly all information stored in AIRBASE. Not included are meta-information of the phantom stations. Also not included is raw data with an averaging time other than hourly or daily. More and more we receive data based on weekly or 4-weekly sampling periods. This information is not yet included in the dumps but in the near future we hope to be able to include this as well.

In our work plan for 2005 it is scheduled to prepare some "tips and tricks" to make the dumps easier accessible. This will include also some macros for manipulating the data in excel spreadsheets.

QA/QC: how to further improve the quality of AQ data in AIRBASE

Frank de Leeuw (RIVM-ETC/ACC)

A discussion paper "QA/QC plan for AQ data collected under the EoI decision" has been developed, and was available to the workshop participants (this discussion paper is at the workshop web pages: http://air-climate.eionet.eu.int/docs/meetings/o41122_9th_EIONET_AQ_WS/meetings041122.html)

The quality of the data transferred to AIRBASE has been, and still is, the responsibility of the data providers, where QA/QC requirements and procedures are described in the Daughter Directives, the EoI decision, and in EuroAirNet Criteria report (see <http://reports.eea.eu.int/TEC12/en>).

Presently, the ETC/ACC carries out a data acceptance check, which is not a validation step, but rather a screening of questionable data according to set criteria. This acceptance test includes:

- checking for completeness of "essential" meta data,
- checking for overwriting of existing data,
- whether stations with data are deleted,
- checking for outliers,
- (re)calculations of aggregated and statistical data.

Further improvement of data quality is needed! Activities in 2005 will include:

- checking of station coordinates,
- filling data gaps (in time (historical) and in space); data suppliers are requested to check for spatial or temporal gaps in the national data and to (re)submit historic data,
- checking for "phantom" stations, that is, with meta-information but without any raw air quality data,
- development of data quality flags (QA/QC code according to EuroAirNet criteria).

Data quality improvement also involves DEM operation. A DEM training workshop is planned for 2nd quarter 2005. This will include DEM8.0 training, as well as exchange of views on data validation procedures and implementation in Member Countries.

A special data quality issue is the determination of correction factors to be used with non-reference monitoring methods for PM₁₀. An inventory of the correction factors presently in use has been produced by the ETC/ACC, and a draft report was available to the workshop participants (see the workshop web pages). Countries are urged to develop their correction factors and report the results from their intercomparison studies.

The ETC/ACC recommends that:

- the PM₁₀ data are identical in the national database and AIRBASE,
- information on method and correction factor used should be mandatory input to AIRBASE,
- correction factors for PM_{2.5} should be developed.

AIRBASE could be developed into a more complete data base which could form the basis for an AQ assessment tool. Further first steps should then be taken to complete the data coverage:

- Outlier/statistics checks on historical data
- Adding data from the compliance reporting ("DD questionnaires") to AIRBASE
- Adding essential but now non-mandatory data items, e.g.
 - NUTS level IV,
 - Population and area data (for area-representative stations),

- Street and traffic data (for street stations).
- Re-evaluating the station classification, exploring methods that can discover misclassified stations. An attempt to do this has been carried out, using NO/NO₂ ratio as a classifier parameter. For this it is important that both NO₂ and NO data is submitted.

Discussion.

Q.: We already submit NO_x data!

A.: Unfortunately not all countries submit NO or NO_x-data. For an empirical classification of the stations but also for other applications (for example, relating changes in NO_x emissions with changes in concentrations) information on NO_x (sum of NO and NO₂) is needed. Using the DEM hourly data on NO can easily be included in the submission.

Q.: Will you, guided by this NO/NO₂ ratio procedure, change the station classification?

A.: No, station classification is the responsibility of the data supplier. Similar to the case with raw data, the ETC/ACC will never make any modification unless we have the (written) confirmation of the data supplier.

Q.: Making more items mandatory information will increase the workload of the data suppliers.

A.: Yes, that is realised; the number of mandatory items will be kept as low as possible. What we propose is to enlarge the list of mandatory items with information which is essential for a correct interpretation of AIRBASE data. Further discussion on this is needed, for example in the DEG.

In the previous workshop we discussed already that for a correct interpretation a station should be characterized both by type of area (mandatory) and type of station (non-mandatory). For interpretation of spatial or temporal variations in PM₁₀ data, information on the applied correction factors is needed. As indicated data on NO is important. NO data is readily available as most monitors measure NO and NO₂ simultaneously. Asking for NO will only marginally increase the workload.

Q.: When is the DEM workshop planned?

A.: It is proposed to have such a workshop after finalising the new DEM 8.0 which will be end May. Whether this training will take place depends strongly on your interest (an enquiry under the audience resulted in 9-10 interesting countries) and on the available financing (interest in the training was reduced to zero if participation was not reimbursed).

Information on further development of real-time AQ data web presentation, cooperation EUMETNET - EEA

Jaroslav Fiala (EEA)

The ETC/ACC ozone web-site for presentation of near-real time ozone data on European map was established some years ago, as a response to an EEA-sponsored Ministerial Conference on tropospheric ozone in NW Europe.

The purpose of the web site (<http://ozone.eionet.eu.int>) is to:

- provide near-real time data on ozone in Europe to scientists, authorities and the public.
- provide a basis for developing forecasts for ozone (short-term forecast, 1-3 days ahead).

National authorities and scientists have a need to look at ozone data in areas and countries close to themselves, when an ozone episode seems to be building up.

Presently 7 countries (Austria, Belgium, Czech Republic, Denmark, Finland, Ireland, Netherlands) post their on-line ozone data on the web site, see the map below. There

is a procedure for automatic transmission of the data to the web server. The picture below shows the stations presently included, and the ozone situation on 18 November 2004 at 15 hours.



Next steps, in addition to attracting data from more countries and technical improvement points, include to join action with the EUMETNET (network of European meteorological services) initiative to develop an European air pollution forecast system, first for ozone, and then possibly for other pollutants. EUMETNET Working Group on Environment has established the EFNet project with this aim. Real-time ozone data are needed for the development of the forecasts. Contacts are made with the EU research projects PROMOTE and GEMS, which are also dealing with development of air pollution forecast systems.

Workshop announcement

The EEA and EUMETNET has called a workshop 7-8 April 2005 in Copenhagen: "Real time air pollution data exchange and forecast in Europe", to which EIONET participants are invited.

EEA/EIONET involvement in this activity could be regarding:

- definition of user requirements,
- realization of near on-line data flow,
- dissemination and presentation of the "product": maps of actual and forecasted air pollution.

Discussion

Q.: Why are no Mediterranean countries delivering data?

A.: No idea. When starting the development of OzoneWeb all European countries were invited to participate.

Q.: Why is there no German data on the smog warners map hosted by AEA Technology?

A.: There happened to be some technical problems related to including the German ozone data in the particular example shown. But this brings me to the question why

Germany delivers data to the smog warners web site but not to OzoneWeb. *There is no extra budget on national level to convert the data into the format required by OzoneWeb.* The ETC/ACC has prepared an information package on the exchange protocol and will assist in implementing these tools.

Q.: *Why is there a need for such a European based solution when individual countries present this information on-line anyway?*

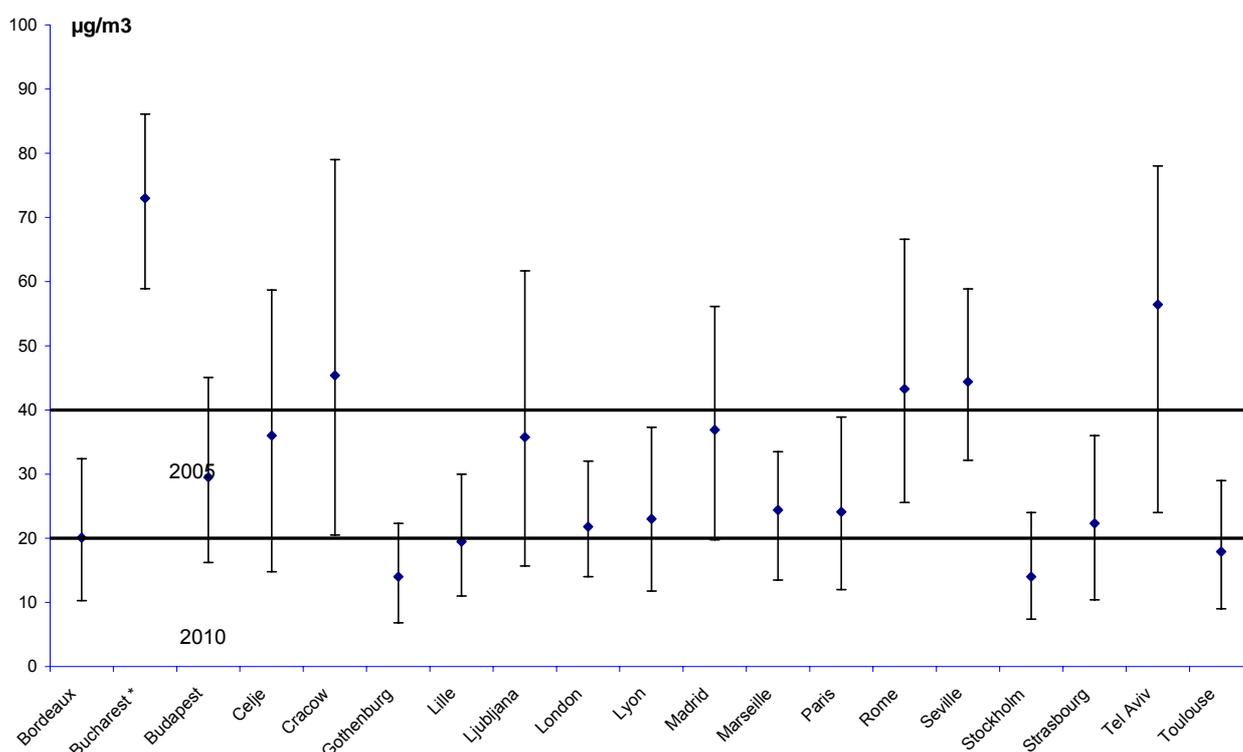
A.: This European web-page allows (when a more complete data coverage is realised) countries to see at one place the ozone situation around them, which is a need e.g. when an ozone episode is building up.

Use of PM AIRBASE data for Health Impact Assessment – practical experiences of the APHEIS project

Hans-Guido Mücke (WHO/CC-Berlin)

The APHEIS project – “**Air Pollution and Health: a European Information System** to assess the health Impact of Air Pollution” (co-funded by EC DG Sanco “Pollution-related Diseases programme” and participating institutes), aims to create an epidemiological surveillance system of effects of air pollution (SO₂, NO₂, O₃ and PM) on health. It is a network of environmental and public health professionals in 16 centres, including 26 cities in 12 European countries.

Regarding the PM part of this study, the WHO/ECEH software AirQ2.0(2003), which is used to assess exposure and effects, requires data over full calendar years, as is also required by the EC legislation. In the 26 cities, a total of 128 PM₁₀ stations are in operation, of which 84 are relevant for health impact assessment (HIA) (based upon station location and representativeness). Similarly, there are 15 PM_{2.5} stations in operation, relevant for HIA (if you want, you can insert table A here, which gives the best overview). Correction factors for non-reference monitoring methods have been specified and are used throughout the network. Annual mean PM₁₀ concentration in the 26 cities varied within 14-73 ug/m³ (see the Figure below).



Bucharest shows the highest PM₁₀ levels, but in this city measurements were only available for four weekdays (Monday to Thursday); this may explain the high levels observed

The coverage of PM₁₀ data in AIRBASE for those cities was much less than actually operated in the cities. Only 24 of the 84 APHEIS stations had data in AIRBASE for year they used (2000). This indicates that to the extent that the APHEIS stations are in regular routine long-term operation satisfying QA/QC criteria, there is a substantial number of PM₁₀ stations in operation in European cities which are presently not reporting to AIRBASE. Although the number of PM₁₀ stations in AIRBASE has increased substantially the later years (e.g. from 498 stations in 2000 to 1110 stations in 2002) it is a challenge to keep increasing the number of stations in AIRBASE, so that projects like APHEIS can be better served, and would thus save time and effort not having to access data from other sources.

SESSION IIA: AIR QUALITY ASSESSMENT AND AIR POLLUTION INDICATORS

Latest development in Structural indicators (SI) and EEA-ETC/ACC set on Urban air quality indicators

Frank de Leeuw (RIVM-ETC/ACC)

The urban air quality indicators prepared by the ETC show the (potential) exposure of the urban population to concentrations above the limit or target values as laid down in the Daughter Directives. In co-operation with DGEnv and EuroStat additional *structural indicators* are developed. These new indicators are directly linked to the health effects in terms of increased premature deaths and changes in life expectancy (PM₁₀) and increased deaths (ozone).

The PM₁₀ indicator is based on the population weighted mean of (sub)urban annual mean background concentrations. The ozone indicator is based on population weighted mean of the mean (sub)urban background SOMO₃₅ values; SOMO₃₅ is the sum of excess of daily maximum 8-h means over a cut-off of 35 ppb calculated for all days in a year.

In order to make ensure the comparability between countries, very strict requirements were applied on the AIRBASE data: (i) data coverage above 75%, (ii) only urban or suburban background stations, (iii) only agglomerations with more than 250 000 inhabitants. To ensure the comparability over time, 'stable' station sets, that is, a set of stations operational during the full time period, have been defined. Preliminary results of structural indicators for PM₁₀ and ozone were shown. Next steps are to refine/improve the methodology and to perform a sensitivity analysis.

UK Air Quality Indicators

Janet Dixon (DEFRA, UK)

From the data of the extensive UK air quality monitoring network, selected air pollution indices and indicators are calculated, which aims to show the status and development of air pollution in UK in a fashion consistent with UK sustainable development strategies:

UK Air Pollution Index (www.airquality.co.uk/archive/standards.php#band)

- used to provide a public summary of current and forecasted air pollution,

- scale 1-10 in 4 bands of 5 pollutants – ozone, PM₁₀, SO₂, NO₂, CO (see figure below, left frame),
- produced for all 16 UK zones and largest 16 of the 28 UK agglomerations,
- the reported levels reflect the highest scale for any single pollutant,
- health advice associated,
- mainly driven by ozone and PM₁₀.

UK Air Quality Headline Indicator

- Basis in UK Sustainable development strategy (one of 15 indicators),
- Developed in 1998, reviewed in 2002,
- Reflects “acute” air pollution issues,
- Counts number of days of moderate and higher (from the AP index) pollution for the 5 pollutants,
- The indicator does not exactly reflect the UK AQ strategy objectives.

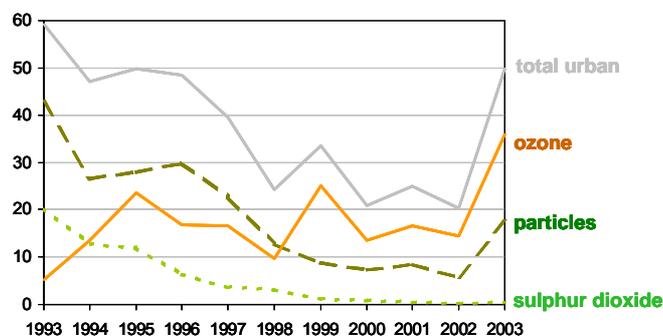
This indicator presently uses data from selected 49 urban and 16 rural/remote sites, which cover 26 of the 28 UK agglomerations. The figure below (right frame) shows the indicator value from 1993 to 2003 for the urban sites, indicating the high 2003 value, which is explained by the exceptionally hot summer that year. It also shows the contributions to the indicator from the various pollutants.

The UK evaluation of the indicator is that it adequately reflects the peaks, which was the objective, but it does not reflect the long-term trends in annual average concentrations, which shows in the UK (as in many other European countries) reducing PM₁₀, NO₂ and SO₂, but increasing ozone levels. The UK indicator is currently under review.

UK Air Pollution Index

	O ₃	NO ₂	PM ₁₀	SO ₂	CO
µg m ⁻³ (mg m ⁻³ for CO)	8hr running mean or hourly mean	Hourly mean	24 hour running mean	15 minute mean	8 hour running mean
Low (1-3)	0 – 99	0 - 286	0 – 49	0 – 265	0 – 11.5
Moderate (4-6)	100 – 179	287 – 572	50 – 74	266 – 531	11.5 – 17.3
High (7-9)	180 – 359	573 – 763	75 – 99	532 – 1063	17.4 – 23.1
Very high (10)	> 360	> 764	> 100	> 1063	> 23.2

Causes of air pollution at urban sites



SoEOR2005 Air Pollution Chapter
Steinar Larssen (NILU-ETC/ACC)

The air pollution chapter of the State of the Environment and Outlook Report (SoEOR) 2005 of the EEA is being developed by ETC/ACC. The chapter will be part of Sub-report 6 on “Climate change, air quality and sustainable energy”, which has a Part A on Climate change (CC) and sustainable energy, and a Part B on Air Quality.

- The focus of the Part B report on Air Quality should be on:
- co-benefits of long-term CC objectives,
 - analyse progress towards AQ targets by 2010,
 - outlook on AQ towards 2030.

At the time of the workshop, only parts of the work had been carried out. Present tendencies on air quality in Europe (1996-2002) are (see figure below):

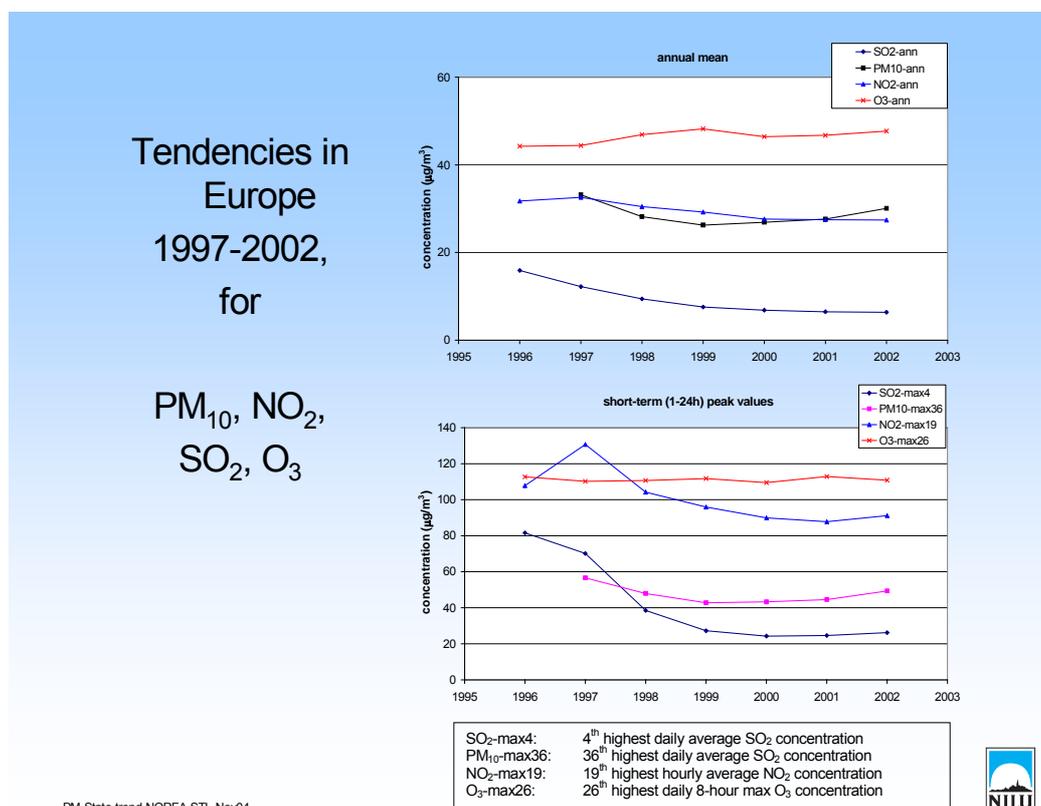
- reductions in NO₂ and SO₂ concentrations towards 2000, then flattening out,
- reductions in PM₁₀ towards 2000, increasing after that,
- increasing ozone annual average and stable short-term high percentiles.

There are frequent and widespread exceedances of PM₁₀, ozone and NO₂ concentrations presently, while SO₂ concentrations are very low. Maximum concentrations measured of NO₂ and PM₁₀ are more than double the EU Limit Values, while maximum ozone concentrations are about 40% higher than the ozone Target Value.

Work on outlook towards 2010 and 2030 is in progress.

Discussion

The use of correction factors (CF) for non-reference PM₁₀ methods, in such assessments of state and trends where several countries and years are involved, was discussed. The concern was that changing CFs with time would affect the tendencies. In fact, for each country, it is made sure that the CFs don't change over time, so the trends/tendencies in the figures are unaffected by the CF.



SEC – Street Emissions Ceiling Project

Steinar Larssen (NILU-ETC/ACC)

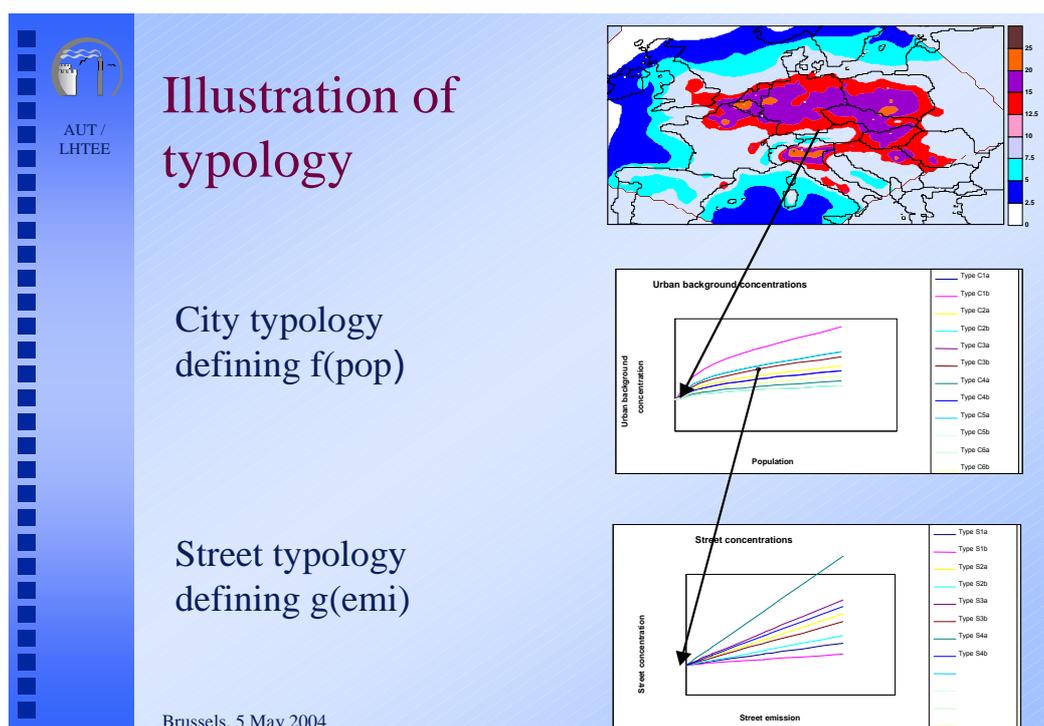
The objectives of the Street Emissions Ceiling (SEC) project, which is part of the ETC/ACC work plan, are:

- to develop a method for determining the *needed emission reductions in hot spots* (i.e. streets) to reach certain AQ thresholds, on top of Europe-wide abatement measures.
- to be used by local authorities, to get overview of AQ near main road system, and to set SECs for individual streets.
- to be used in IAM for CAFE programme, to evaluate need for additional local measures, and as a part of the basis for cost calculations and optimisation.

The policy-relevant questions behind this project are:

- What does the hot-spots mean in terms of contribution to population exposure
 - in a city, or Europe-wide ?
 - it is the high end of the exposure distribution
 - are only few people exposed ?
- How will existing and future policies (e.g. CAFE scenarios) affect the hot-spot contribution to population exposure (and to effects) ?
- Will local measures be necessary in addition ?

Pollutant concentrations in a street hot spot is the sum of contributions from regional and urban scales, plus the street traffic's own contribution. Due to chemical reactions, there are couplings between these scale contributions. The concept of the SEC project is to develop a street typology reflecting this sum of contributions, see the figure below.



In different parts of the project, the typology has been defined, monitoring data from station pairs (street station and a near-by urban background station) in 4 cities has been analysed to provide a basis for evaluating traffic emission factors taken from emission factor data bases (i.e. COPERT 3), and street/line source models have been tested against these monitoring data time series.

The street types in the typology are shown in the table below.

Table: Input parameters for the modal (typical) street of street types¹⁾

Geometry/driving pattern	Geometry parameter	% trucks	Canyon width	Driving pattern ²⁾	Wind speed	Fleet age	Distance ³⁾
Urban motorway (4 combinations)	$z_0=0.1\text{m}$	7%/15%	-	80 km/h	Coupled to EU region	Coupled to EU region	25m; 100m
Urban non-canyon street (4 combinations)	$z_0=1\text{m}$	7%/15%	-	26km/h			10m; 40m
Canyon (4 combinations)	H=15m	7%/15%	15m 40m	26km/h			5m 15m

¹⁾ In addition the age of the fleet and the average meteo wind speed has to be taken, dependent on the EU region. This needs to be defined later, consistent with the regions chosen in City-Delta.

²⁾ The speeds in the table are a crude indication. If emission data allow, the emission should be based on a pattern intermediate between free-flowing and congested for the street types concerned.

³⁾ The lower distance should not be combined with unrealistically high traffic intensities.

The evaluation of the COPERT emission factors gave generally acceptable results in terms of the ratio between PM and NO_x emissions. However, the PM₁₀ and PM_{2.5} monitoring data gave the possibility to estimate the contribution to street-level PM₁₀ concentrations from (re)suspension of street dust.

A short-term effort to provide input to the CAFE Thematic strategy is proposed to include:

- Select a small number of real or “model” streets,
Place them in cities in different European regions
 - different fleet characteristics
 - different meteo regimes,
- Calculate hot-spot contributions – using line source models (OSPM/CAR/....)
 - for baseline scenarios
 - for CAFE scenarios,
- Add rural/urban background (from RAINS/CD or EMEP/OFIS),
- Estimate added population exposure from hot-spots
 - use street/traffic statistics from European cities.

Mapping of Air Quality for support of AQ Assessment in Europe

Jan Horalek (CHMI-ETC/ACC)

There is a need for assessments of European air pollution concentrations which has a more complete spatial coverage than can be acquired from monitored points only. This need arises both from the EU AQ legislation and from the need to assess effects of air pollution better.

Mapping techniques to improve the spatial coverage include:

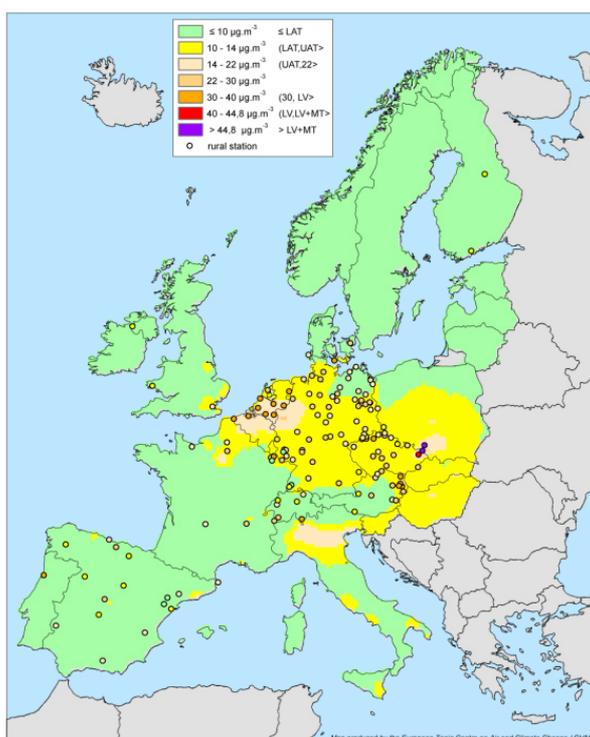
- interpolation of measured data, for which there are several techniques available, of two main types:
 - deterministic
 - kriging.
- Modelling of transport, diffusion and transformation
- Combination of measured and modelled concentrations (e.g. data assimilation).

Jan Horalek presented various examples of use of these methods on existing air pollution data and maps. It was apparent that different methods gave different

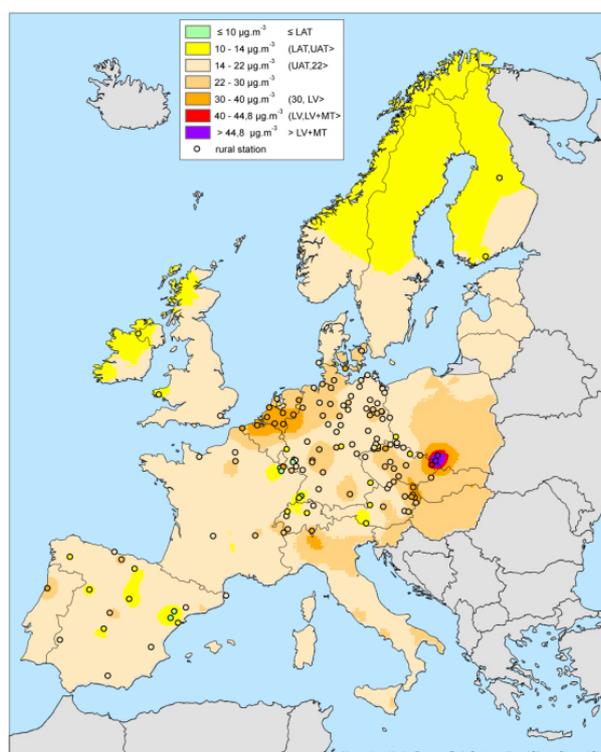
results, and the choice of method to be used is not always apparent. An example is shown in the maps below, where annual average PM₁₀ concentrations are shown, first from the EMEP model, then a map where the modelled concentrations have been combined with measured data, using kriging method (the differences between measured and modelled have been interpolated by kriging, and added to the modelled concentrations).

The quality of the interpolation and data assimilation results can be assessed/quantified, as a basis for choosing. The work is presently in an exploratory phase. The mapping methods can be further developed, for instance by introducing more parameters in the analysis, such as meteorological data (wind, precipitation, temperature).

PM₁₀ - Annual Average, 2000
EMEP Model



PM₁₀ - Annual Average, 2002
Comination of Measured Air Pollution Data and EMEP Model
(addition of EMEP Model and differences interpolated by kriging)



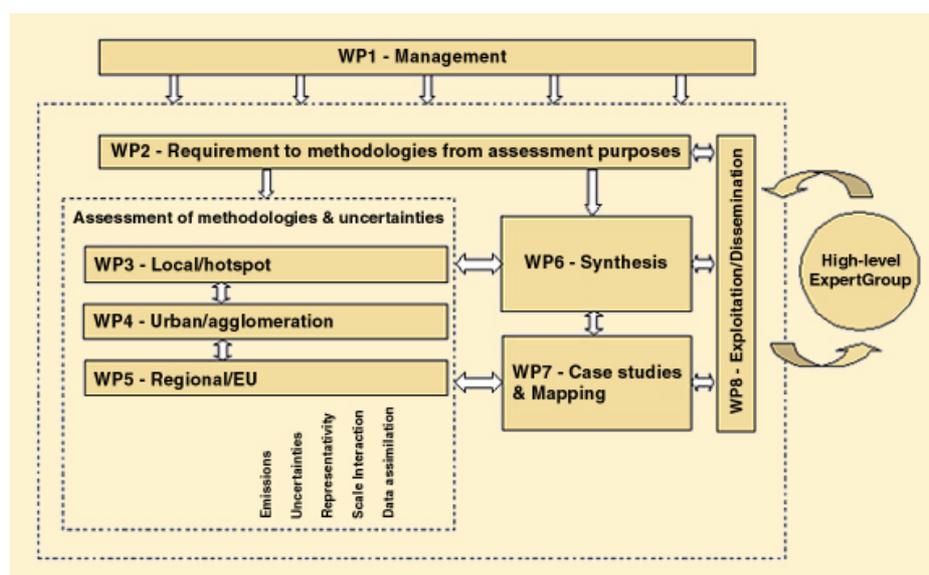
AIR4EU project: Air Quality Assessment for Europe: from local to continental scale

Bruce Denby (NILU-ETC/ACC)

This policy-related EU research project has as its main aim ‘to formulate a guidance document on best practices for the combined use of monitoring methods and models to assess Air Quality in Europe’. Mapping methodologies are also an important part of this project.

- The scales covered are the local (hot-spot), urban and regional scales.
- Themes covered are emissions data needs, monitoring, modelling, uncertainties, representativeness, scale interactions and data assimilation methods.
- The recommended methods are to be tested and applied in city case studies, and 7 cities are involved in the project (Paris, Rome, London, Prague, Athens, Oslo, Rotterdam).

The project structure is shown below:



Two main outputs from the project are:

- Recommended methods for integrated Air Quality assessment with emphasis on the combined use of monitoring and modelling,
- air quality maps covering all scales, including case study examples at hotspot, street, urban, agglomeration and regional level for PM₁₀, PM_{2.5}, NO₂, O₃, CO, SO₂ and benzene.

Major steps in the project are:

1. Define the needs of cities and policy makers
Input from partner cities and CAFÉ
2. Review current methodologies, recommend best methods
All 3 scales (local, city, regional)
All 5 themes (Emissions, uncertainty, representativity scale interactions, data assimilation)
3. Synthesize recommendations and develop case studies
Case studies carried out in conjunction with city partners
Use case studies for testing, improvement and assessment
4. Develop web portal to display maps
All 3 scales to be displayed
Maps to reflect uncertainty and representativity
5. Disseminate results
Website, reports, workshops
'good practice' database.

AIR4EU Workshop announcement:

Air4EU open workshop, June 2005

Location: Athens

The first of two open workshops organized by Air4EU to discuss matters of air quality assessment relevant to Air4EU and to other interested parties

The aim is to receive feedback from both users and researchers and to help disseminate results from the project

SESSION IIB: EEA CONTRIBUTIONS TO THE CAFE PROGRAMME

Working Group on Target Setting and Policy Assessment (WG TSPA), and the CAFE Steering Group.

Jaroslav Fiala (EEA)

The EEA is represented in this Working Group by Jaroslav Fiala.

The WG TSPA working group is one of the 3 CAFE-related working groups.

- The purpose of WG TSPA is to assist the Commission in the development of air quality related targets for the protection of human health and the environment;
- The WG will also give advice on issues related to policies and measures and their effect on the air quality and other aspects of economic, societal and environmental development.

The main tasks of the TSPA working group are

- to assist the Commission in setting policy relevant AQ indicators, including their quantification, by evaluating and influencing the integrated assessment modelling (IAM) being carried out within CAFE,
- to assist in the analysis of policies and measures related to the development of the AQ thematic strategy.

Preliminary proposals from the TSPA for effects-related indicators include (pending a discussion of priorities and ambition level for each of the indicators):

- Changes of life expectancy, as indicator for PM_{2.5},
- Changes of number of deaths as indicator for ozone, with a threshold of 35 ppb,
- Acidification and eutrophication: excess load or other indicators to be defined,
- Vegetation effects of ozone: AOT₄₀, and to consider the flux-based approach.

Working Group on Implementation.

Frank de Leeuw (RIVM-ETC/ACC)

The EEA is represented in this Working Group by Frank de Leeuw. Its main objective is 'to support harmonised implementation in the Member States of the FWD, its Daughter Directives and the National Emission ceilings (NEC) Directive.

The main activity of the Working group on Implementation in the past year was the preparation of recommendations for review of the first daughter directive. The issues considered by the Working Group include the concept of zones, limit values and derogations, air quality measurement methods and measures. The issue of computer modelling was not considered because this was being addressed in a parallel consultancy study. The Working Group has also not reconsidered possible revision of the limit values, because that aspect of the review is part of the integrated assessment under the CAFE programme.

A draft version of the WG report has been discussed during the CAFE steering group meeting of 17-18 May 2004. The final report is available at:
http://www.europa.eu.int/comm/environment/air/cale/working_groups/pdf/wg_report.pdf

On next items to be discussed within the WG no decision has been made yet. Possible topics are: providing guidance on reporting of national programme under the NEC directive and providing guidance on action plans according to Art 7(3) of the Framework Directive.

GENERAL DISCUSSION

The floor was opened for a general discussion on the workshop itself, and on the general concept for the next workshop. Comments and discussion topics were:

What was missing in the workshop program/what was unnecessary/what should the next workshop program contain? More contributions from countries?

Rob Swart, ETC/ACC leader argued for a more balanced program, with more contributions from countries.

- countries (may be selected ones) could be contacted for specific contributions,
- there could be parallel groups during parts of the workshop, and two types of contents can be defined: a technical part (data transfer, QA/QC etc.) and an AQ assessment part.

There was some disagreement on this proposal for parallel groups. Rather certain parts of the program could be enhanced (such as data exchange topics) and others could be reduced, while no specific suggestions on what to reduce came forward.

It was pointed out that the workshop program and presentations should be set and distributed in good time before the workshop. Several participants, including some from newly participating countries, suggested it would be good to learn from other countries' experiences. Could a forum on the web for exchange of experiences be a good idea? Also, the DEM workshops (the next one scheduled for 2nd quarter 2005) could be a place for exchanges of experiences regarding data transfer and related issues.

This discussion concluded in the proposal that the group planning the next workshop should include representatives from countries. Janet Dixon, UK and Savvas Kleanthous, Cyprus volunteered to be part of this.

Health related monitoring topics as part of the workshop program

Hans Guido Mücke, WHO Collaborating Centre at UBA Berlin, was of the opinion that health related air quality monitoring should have been discussed during the

workshop, and not in the common session with the TFMM group, not least since some participants tend to leave early.

It was argued that the discussion on monitoring strategies in Europe, a part of which concerns health-relevant monitoring, belongs in a common forum with other relevant groups. The LRTAP Convention now also deals with health effects of air pollution, so health related monitoring is not beyond their interest.

CONCLUDING REMARKS

The program at this 9th workshop seems to have been too heavy on the assessment part, and that not enough time was allocated to the more technical issues of data transfer, data quality etc.

The workshop planning committee for the 2005 workshop will contain two country representatives (from UK and Cyprus). It is important that the workshop program is planned better around the present needs of the EIONET participants, and that their role in workshop is better defined.

It is also important that the program and agenda be set in good time before the workshop, and that workshop material, including extracts of presentations, be distributed well before the workshop.

COMMON SESSION EIONET – TFMM: AIR QUALITY MONITORING STRATEGIES IN EUROPE

The scope of the session was to discuss improvements in the AQ monitoring efforts in Europe, to highlight the main AQ monitoring needs and requirements, and to discuss the development of a strategy which will support a harmonisation of objectives of all main activities.

Presentations:

AQ monitoring as a support for assessments and policy decisions in CAFE

Andrej Kobe (EC DG Environment)

Kobe briefly described the CAFE program which are to deliver a thematic strategy on air quality in May 2005. The strategy is to support an integrated policy which is to achieve levels of AQ in Europe that do not give rise to significant negative impacts or present risk to health and the environment.

AQ monitoring in Europe which supports CAFE includes both the EMEP monitoring, the 'compliance monitoring' related to the EU AQ Directives, the National monitoring programs, as well as monitoring carried out outside EU.

The Directives' related monitoring is extensive now, but the time series are relatively short still, and design of networks is still in progress. *The experiences from these monitoring efforts are positive:*

- increased public and political awareness,
- results in some effective actions,
- protection of the rights of citizens (for healthy air),
- some impact on spatial/urban planning,
- identification of needs for action.

Topics related to the *needs for improvements in network design* are, e.g.:

- proportion of different station types (traffic, (sub)urban background, rural, etc) differs considerably between countries,
- station location criteria,
- reference methods,
- application of random sampling.

Future challenges for AQ assessments in Europe include:

- AQ forecasts for 2020 and beyond,
- identification of cost-effective measures,
- improvements in modelling efforts:
 - emission inventories,
 - PM secondary organics,
 - ozone trends,
 - PM contributions (regional, urban, hot-spot/traffic).

Kobe concluded with the main challenges related specifically to the AQ monitoring topic:

- PM_{2.5} monitoring needs to develop further,
- AQ monitoring needs to be more health relevant,
- Important to maintain and improve rural background monitoring (EMEP),
- Hemispheric pollution issues,
- Knowledge gaps related to PM especially: needs for super-sites (ultra fine particles, speciation, etc),
- Data needs to be related to relevant effect indicators,
- Data needs for validation of models,
- Use of data from remote sensing (such as satellite data).

The discussion after the presentation brought up the need to consider monitoring of PM₁.

EMEP monitoring strategy

Kjetil Tørseth (EMEP-CCC/NILU)

Tørseth described the EMEP monitoring strategy 2004-2009, which has now been adopted by the EMEP Steering Body and is available from:

http://www.nilu.no/projects/ccc/monitoring_strategy/ .

The strategy involves 3 levels of monitoring objectives:

- Level 1: long-term basic chemical and physical measurements of traditional EMEP measurements;
- Level 2: monitoring to provide parameters essential for process understanding;
- Level 3: Research-driven monitoring (super-sites).

Some items have to be resolved to ensure its implementation:

- technical issues related to monitoring (methods, QA/QC etc),
- financial and organisational issues (harmonisation, collaboration, ...),
- selection of super-sites.

The strategy is further detailed in terms of parameters and extent of monitoring at the different levels, in various countries.

The discussion centred around the needs for both monitoring and modelling, and how the monitoring strategy is motivated by the needs for data for model validation.

Analysis of AQ monitoring networks in relation to protecting human health, and indication of deficiencies in European monitoring networks with respect to AQ Directives' requirements

Frank de Leeuw (ETC/ACC, RIVM)

de Leeuw discussed the following hypothesis re. AQ monitoring networks in Europe:

- There is a shift to more urban stations
- The FWD has resulted in a more uniform monitoring strategy in EU Member States.

More urban stations?

The contents of AIRBASE is as follows:

- PM10: actually the regional stations fraction has increased from 4% in 1996 to 9% in 2001, so although low, it is increasing. The sum of urban and traffic stations has decreased its fraction from 87% in 1996 to 75% in 2001. The fraction of traffic stations has increased at the cost of urban background stations.
- Ozone: The urban stations fraction has been unchanged at about 65% since 1996.

Thus it seems like the extent of regional monitoring is not loosing relative to urban monitoring. Please note that the number of stations has increased substantially since 1996, both for urban and regional stations.

More harmonised network design?

de Leeuw discussed this in terms of number of stations in a country, per million inhabitants, fuel use and area. Representativeness of stations was discussed based upon the spread in concentrations measured at different stations in some cities with many stations, such as Linz, Gdansk, Praha, Brussels, Hamburg, London.

de Leeuw drew the following preliminary conclusions:

- Increasing number of stations, but no change in fractions
- Large differences in monitoring strategy; AQ Directives seems (so far) not to result in more harmonised network design
- AQ Directives' requirements might not be fully met in all MS
- Deficiencies in European networks regarding population exposure.

Points from the discussion:

- Most EMEP stations don't measure PM10. Good if national regional PM10 stations could be placed close to or be co-located with EMEP stations.
- PM10 data are problematic due to the correction factors used for automatic monitors.

Application of observations by satellite in AQ assessments

Aasmund Fahre Vik (NILU)

In terms of AQ data, Earth Observation satellites represent advantages and limitations:

Limitations:

- currently in polar orbits,
- one overpass per day = low time resolution,
- limited spatial resolution,
- limited to clear sky (often to daylight) conditions,
- strong stratospheric absorption.

Advantages:

- monitors the oceans and remote locations,
- provides maps rather than point measurements.

Most applications of EO satellites relate to the stratosphere, but there are also some tropospheric applications. Fahre Vik went through various programmes, projects and activities which provide methodologies and data related to EO satellites, such as:

- GMES (Global Monitoring for Environment and Security)
- Daedalus project (user needs on aerosol data products)
- GSE-PROMOTE which relates to stratospheric ozone, UV, climate and AQ, model/monitoring assimilation, AQ forecasts, NO₂/SO₂/aerosol monitoring, future: O₃, HCHO. (<http://www.gse-promote.org>).
- examples from the GOME satellite observations (e.g. NO₂ trends over USA, Europe, China),
- examples of regional maps (e.g. NO₂ over Europe from SCIAMACHY),
- examples of global maps (e.g. HCHO, CH₄, NO₂, from SCIA).

Are there real AQ-related applications for EO data?

- They can provide background data for AQ models.
- Monitoring of intercontinental transport,
- Regional and global assessments.

EO data may provide complimentary data to ground-based in-situ networks.

In the discussion, it was pointed out that EO data are useless without corresponding surface observations.

Implementation of the AQ Directives in Greece

A.D. Adamopoulos (Min. of Env., Greece)

This presentation shows how the Air Quality Framework Directive has been implemented in Greece and provides information on the problems faced, the tools and methodology used, the administrative structure of the monitoring network, the financial elements for the implementation and also gives some data of the air pollutants measured.

Among the main problems faced are the over-concentration of population and activities in large cities, especially in the greater Athens area and the meteorological conditions that favor high levels of pollutant concentration (temperature inversions, high levels of sunshine, intense photochemical activity, high ozone background values).

An extension of the Air Pollution Monitoring Network was made and new stations were added in 2001: 8 stations in Athens, 3 stations in Thessaloniki, 2 stations in the rest of the territory. In addition, 3 more stations are planned to be installed in urban environments in some Greek cities in the province, 1 rural station and 1 more station in an ecosystem near the river Axios.

New pollutants have been monitored since 2001 such as PM₁₀ and benzene and new pollutants are currently monitored such as PM_{2.5} (fixed measurements), heavy metal and benzo(a)pyrene (indicative measurements).

A new data acquisition system was developed. This uses a telecommunication system with capability of collecting real time data. The appropriate software was also built to calculate the required statistical data (in order to fill in the EU questionnaires), to exhibit any exceedances of the limits, alert values and assessment thresholds and to perform remote calibration of the instruments.

Implementation of the new EMEP monitoring strategy in France

Natalie Poisson (ADEME)

The EMEP strategy suggests the following number of stations in France:

- Level 1:
 - Inorganic pollutants (including ozone): 8 stations
 - Heavy metals (precipitation) and PM-mass: 4 stations

The current situation in France is that the 8 station for inorganic pollutants are operational; for heavy metals (prec.) and PM (mass) 1 and zero stations, respectively, are operational.
- Level 2: 1 station for each of parameters acidification and eutrophication, photochemical oxidants, heavy metals (in air, and mercury in air and precipitation), POP (in air and precipitation), and PM (speciation).
- Level 3: Through collaboration with other programmes and researchers, it is anticipated that France will cover many of the needs of the EMEP strategy.

The new EMEP strategy is considered as extremely ambitious for France, and according to Poisson's presentation, it is considered "impossible to meet all the requirements (too much human and financial resources)".

In the discussion, Kjetil Tørseth of EMEP/CCC pointed out the need to cooperate with other programmes. France has some 100 PM₁₀ stations in operation in other programmes! Especially need for cooperation with networks operated under the requirements of the AQ Directives, to use resources efficiently.

Discussion

Topics for discussion:

1. Can the objectives of compliance checking, scientific assessment and public information be combined and if so, how?

Although there are clear differences in the objectives of the EMEP network (strong focus on the long-range transboundary question) and of the national networks operated under the Framework Directive (strong focus on compliance), there is also a large overlap in objectives. Currently a number of stations participates both in the EMEP network as well as in the national network; a further sharing of stations (and information) is recommended. However, at the meeting the point was raised whether the current networks are adequate for answering the questions related to health impact assessments, assessment of trends in emissions etc.

2. How can the European AQ monitoring network design (e.g., type, number of stations) and management, streamlining of data flows be improved to increase efficiency?

As the countries are responsible for their air quality, optimizing a network should be done at the national level. At a European level only some guidance can be given. One option for efficiency improvement, is an optimisation of the SO₂ network. Concentrations are in most part of Europe so low that current networks seems to be too dense. Closing some of the SO₂ stations may free resources in favour of the monitoring of other pollutants (e.g. PM_{2.5}). Improving the efficiency is also related to the quality of the data; data of unknown or low quality will not be used in assessments. QA/QC of the data will require continuously our attention in order to guarantee the high quality of the data.

3. Which concrete opportunities exist for EMEP-TFMM – EIONET collaboration in the coming years?

An important topic for further collaboration is the QA/QC of data. A second topic is the harmonisation of VOC monitoring. The requirements of EMEP for level 2 stations and the requirements from the ozone directive do not match.

4. Was the joint EIONET-TFMM session useful and should we repeat this next year?

Yes, we find these sessions very useful. But both organisations have to follow their own workplan which may cause differences in emphasis and time schedules. Nevertheless it is proposed to repeat a common session, for example discussing the design of networks from the health perspective.

ANNEX 1 WORKSHOP AGENDA

1st day: Monday 22 November

09:00 –	Welcome, scope and goal of the workshop (ETC, EEA)	Rob Swart, Jaroslav Fiala
09:20	Follow-up 8th AQ workshop	
.1.1 Session Ia: AQ reporting		
09:20 –	EU air quality reporting: Status/requirements on reporting on DDs, Data exchange group	Andrej Kobe, DG Environment
09:40		
09:40 –	EEA support of European Environment reporting – Reportnet	Sheila Cryan, EEA
10:00		
10:00 –	Discussion, questions	
10:10		
Session Ib: Information exchange and access tools		
10:10 –	EoI-2003 data submission, EoI Report, Status, use of DEM transmission, Processing EoI reports	Patrick van Hooydonk, Wim Mol, RIVM
10:40		
10:40 –	Coffee Break	
11:00		
11:00 – 11:20	How to improve AQ data exchange: Experiences, problems, suggestions, EoI-procedure	Libor Černíkovský, CHMI
11:20 – 11:40	Information on Air Quality on the web –AirView 3	Wim Mol
11.40 – 12.10	QA/QC: How to further improve the quality of AQ data in AIRBASE	Frank de Leeuw, RIVM
12.10 – 12.20	Info on further development of real-time AQ data web presentation, cooperation with EUMETNET, EEA	Jaroslav Fiala, EEA
12:30 –	Lunch	
14:00		
14:00 – 1420	Use of PM AIRBASE data for Health Impact Assessment - practical experiences of the APHEIS project	Hans-Guido Mücke, WHO-Berlin
14:20 –	Discussions. <i>How to make AQ data/info better available</i> ? E.g. related to AIRBASE: Improvements and further development, better access to information on Air Quality	
15:00		
15.00 – 15:15	Coffee Break	

Session IIa: Air quality assessment and air pollution indicators

15:15 – 15:35 Latest development in SI and EEA-ETC/ACC set on Urban air quality indicators Frank de Leeuw

15:35 – 17:30 National contributions:
Presentations on usage and methodology of (urban) air quality indicators at the national level.

Janet Dixon

- UK AQ Indicators

19:00 Dinner

2nd day: Tuesday 23 November

Session IIa: Air quality assessment and air pollution indicators

09:00 – SoEOR2005 Air Pollution chapter Steinar Larssen

09:15

09:15 – SEC: street emission ceilings Steinar Larssen

09:30

09:45 – Mapping of Air Quality for support of AQ Assessment in Europe Jan Horalek, CHMI

10:00

Jaroslav Fiala

10:00 – AIR4EU Project: Air Quality Assessment for Europe: from Local to continental scale Bruce Denby, NILU

10:20

10:20 – Discussion: Assessment methodologies

10:40

10:40 – 11:00 Coffee Break

Session IIb EEA-ETC contributions to the CAFE programme

11:00 – 11:15 Working group on target setting and CAFE SG Jaroslav Fiala

11:15 – 11:30 Working group on implementation Frank de Leeuw

11:30 – 12:15 General discussion

12:15 – 12:30 Closure of EIONET workshop

12:30 – Lunch

14:00

Tuesday 23 November – 14:00-17:00

Common session EIONET - TFMM

Air Quality monitoring strategies in Europe

The scope of the session is to discuss improvements in the AQ monitoring efforts in Europe, to highlight the main AQ monitoring needs and requirements, and to discuss the development of a strategy which will support a harmonisation of objectives of all main activities.

Welcome, scope and goal of the common session

Chair
Rob Swart,
ETC/ACC Manager

Presentations:

- AQ monitoring as a support for assessment and policy decisions in CAFE
- EMEP monitoring strategy
- Analysis of air quality monitoring networks in relation to protecting human health, indication of deficiency in European monitoring networks with respect to AQ Directives requirements.
- Application of observation by satellite in AQ assessment

Andrej Kobe,
DG Environment

Kjetil Tørseth EMEP-
CCC

Frank de Leeuw,
ETC-ACC

Aasmund Fare Vik
NILU

National contributions:

- Implementation of the AQ Directives in Greece
- Streamlining AQ monitoring requirements in France

A.D.Adamopoulos
Min. of Environment
Greece

Nathalie Poisson,
ADEME

Discussion

Some suggested discussion topics:

- Is the quality of the monitoring data from the various networks good enough, and how to improve?
- On the importance of rural background stations
- Twin/triplet stations to improve assessment of scale related contributions
- Can national monitoring network design be improved to handle efficiently to the various demands (from DGENv, LRTAP Convention, WHO) ?
- The need for an improved monitoring strategy to improve the basis for assessment of health impact

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