PROCEEDINGS

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European Topic Centre on Air and Climate Change

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Front page picture:
Brugge centre; back side of houses along the canal Groenerei (F. de Leeuw)

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SUMMARY

The EIONET workshop on Air Quality Assessment and Management represents the annual meeting place between Member Country representatives, EEA, the ETC/ACC, and associated and interested institutions for exchange of news, results of studies and the activities of the annual work programme of the ETC/ACC. The 13th EIONET workshop was held in Bruges in Belgium on 29-30 September, 2008. There were 76 participants from 30 countries and including representatives from the European Commission, DG Environment (DGEnv) and the Joint Research Centre, the Coordination Centre for Effects (CCE), a data centre under the Working Group on Effects of the Convention on Long-range Transboundary Air Pollution (CLRTAP), and World Health Organisation (WHO). 20 presentations were given in 7 sessions.

The workshop was hosted by the Vlaamse Milieumatschappij (VMM). The Local organiser, Ms. Marie-Rose Van den Hende, welcomed the participants on behalf of VMM. The participants where then welcomed by Ms. Aphrodite Mourelatou, Head of EEA's Air and Transport Group.

Session 1 included one presentation on environmental quality standards: critical loads (CL) for eutrophication and acidification. Jean-Paul Hettelingh (CCE) presented the 2008 CL-database, the objective of which is to provide effect-based support to European air pollution abatement policies in general and to the revision of the 'Protocol to Abate Acidification, Eutrophication and Ground Level Ozone' under CLRTAP in particular.

Exceedances computed with the 2008 CL-database tend to be higher and are distributed over a wider area than those calculated with the 2006 CL-database (see CCE Status Report 2008). The database is now available for use to update EEA's Air Quality (AQ) Core Set Indicator 005 'Exposure of ecosystems to acidification, eutrophication and ozone' (under preparation).

Sessions 2 and 3 dealt with air quality directives and data flows. Presentations included information on the new (2008) Air Quality (AQ) Directive, the 2006 data reporting through the AQ Questionnaire, the 2007 and 2008 EoI reporting cycle, the work of the informal EoI working group on EoI improvements, the AQ Questionnaire workshop in June 2008, and the AirBase User Requirements Survey.

Concerning *the new AQ Directive*, an important new issue is PM2.5 exposure monitoring and reference lab accreditation. With a view to the 2013 review of the Directive, the focus now is on implementation. Implementing Provisions are currently being developed by the Commission with support of the Data Exchange expert group (DEG). Serious abatement efforts are needed, since PM10 limit values were exceeded in 45% of all zones in 2006. Exceedances of the ozone target value were observed in almost as many zones.

For *the 2007 EoI cycle* (for 2006 data), 35 countries reported data to AirBase. The data were available and downloadable through the web viewer by the end of March 2008. During quality checking errors were still found, e.g. re. station coordinates, and visual inspection revealed some suspicious data for benzene, HM, CO and PAH. 2009 work will include further meta data checks, improved QAQC on measurement data, and calculation of NOx from sum of NO and NO2. The DEM v12 will be improved by bug repairs, improved user friendliness as well as by extra data QAQC capabilities.

The informal EoI working group, which was established after needs reported during last year's EIONET workshop on Cyprus, includes experts from DE, FR, PT, ES and UK, and had three meetings in 2008. The group has elaborated suggestions, which will be laid out in their report compiled in late 2008.

The *AQ Questionnaire workshop* held in June 2008 at EEA looked at Questionnaire reporting in a wider context of the EEA SEIS and EEA/MS air quality work. The aim was to go through the Questionnaire in detail, and to have a common session with the GMES Atmospheric Service user workshop. There was good participation in both workshops, was a good opportunity for exchanging views and experiences as well as interaction with the GMES group for some of the participants.

The AirBase User Requirement Survey was carried out on-line using a web-based questionnaire. Topics of identified improvement of information provided by AirBase were the inclusion of zone information such as on limit and target value exceedances, as well as interpolated maps based on measurements and regional modelling results.

The summer ozone reporting (SOR) presentation covered data quality issues, exceedance information for summer ozone in 2008 (April-July), as well as re. merging of SOR with the near-real-time ozone web reporting. Countries are requested to submit data on max 1-hour ozone concentrations, which are still missing for some countries. Ozone target value exceedances were less frequent in 2008 (April-July) than in previous years.

Merging of SOR with the near-real-time ozone web reporting is in progress, and the summer 2008 is a pilot period. So far, there are significant differences between the two reporting platforms, mainly due to the QAQC checks on the SOR data.

In the **Session 2 and 3 discussions,** DG Environment clarified, that the new AQ Directive does not represent a relaxation of the PM10 limit values, and also the reasons for allowing postponement of attainment under certain well defined conditions.

The discussion revealed that the Questionnaire reporting process is now, in its second year, more efficient and less resource consuming, as the process has been improved. It was commented that the Questionnaire needs updating, and the 4th Daughter Directive (DD) reporting will be included. The 4th DD is not yet included in the new AQ Directive.

Regarding the AirBase user survey, need is seen to deepen the feedback, which could preferably be done through more one-by-one discussions with users.

WHO raised the question on how it might be possible to incorporate the public health based AQ monitoring networks that are operated in many countries and cities, into the EoI process. DGEnv response pointed to the need for all national EoI data providers to include as much as possible of available data for each country, not least when reporting the Questionnaire.

Session 4 included very interesting presentations on the PM, ozone and NO2 status in Germany, Austria, Norway and Spain.

In *Germany* there are widespread exceedances of the PM10 daily limit value, while the PM10 annual average and NO2 situation is generally OK. There are quite a few ozone exceedances as well. There has been a consistent downward PM10 trend since 2000, of about –10% since then, while recorded PM precursor emissions show a

steeper downwards trend. The (changing year-to-year) meteorological situations play obviously a role.

Dieselization of the car fleet, as well as particle filters, is thought to cause the increasing NO2 fraction of NOx. Rural ozone has shown a decrease in maximum hourly concentration over the latest years, while max levels are increasing in cities.

Austria is preparing its PM2.5 monitoring network to determine the Annual Exposure Indicator (AEI) according to the new AQ Directive. They are so far planning 17 stations in 6 cities, while the Directive calls for 24 stations. It is considered a problem to run stations undisturbed from now until 2020, since it is difficult to locate stations in a way that they are not influenced by changes in near-by areas.

In *Norway*, PM10 and NO2 are the most important pollutants, and in the cities the main sources of these pollutants are road traffic (including non-exhaust sources, notably studded tyres) and small scale wood burning. Measures include reduction in use of studded tyres, road surface improvements, speed limits to reduce dust suspension, salting and cleaning of roads, clean burning wood stoves and low emission zones (LEZ).

The NO2 problem is expected to increase substantially due to the increase in diesel cars with particle filters.

In *Spain* the PM concentration has been studied in detail at 34 sites across the country. Rural background PM10 varies within 12-21 μg/m^3 (annual average), and PM2.5 within 8-13 μg/m^3, with a different spatial variation than PM10. African dust outbreaks influence the number of exceedances of the daily PM10 limit value, while this phenomenon increases the annual average PM10 with about 1-2 μg/m^3 on the peninsula and up to 4-5 μg/m^3 on the Canary Islands. Source apportionnement has been studied extensively in Spain.

Session 4 discussions concentrated much on PM2.5, their data quality and QAQC procedures. JRC informed that they are running comparison studies between methods, and within CEN there are activities focussing on the evaluation of PM2.5 QAQC procedures. The opinion was raised that in general, PM2.5 emission inventories are relatively uncertain.

Session 5 was on FAIRMODE, the Forum for AIRquality MODelling in Europe, which has been established as a joint initiative of the EEA and the JRC to respond to the requirements of the new Air Quality Directive of introducing modelling as a necessary tool for Air Quality Assessment and Air Quality Management. The main aim of FAIRMODE is to bring together air quality modellers and model users in order to promote the harmonised use of modelling for the assessment of air quality by EU member states.

FAIRMODE has established two working groups: WG1 lead by EEA-ETC/ACC, to develop a guidance document to help model users, and WG2 lead by JRC, concentrating on model QAQC issues. The FAIRMODE Steering Group has participants from the Czech Republic, Finland, France, Portugal and Turkey as well as from EEA, JRC and from selected external experts.

The status of the Modelling Guidance document was presented.

Session 6 included two very interesting presentations on recent studies on ozone trends in Europe.

Solberg presented the results of the IP 2007-08 task of looking at all ozone measurements in Europe reported to the European database AirBase for the period 1990-2005, as well as modelled European ozone levels (EMEP model) addressing the same period. EMEP model sensitivity runs indicated that the natural variability in meteorology can easily mask expected trends in different ozone metrics. It was found that ozone time series of at least 15 years length are necessary to assess if a trend in monitored data is significant or not. Biogenic isoprene emissions are a major uncertainty for the vegetation index AOT40, with a factor of 2 or more.

Roemer studied ozone trends in the Netherlands, Flanders and the neighbouring Northrhein-Westphalen, in relation to variations in NOx emissions at more than 30 stations. The longest time series covered 1992-2007. Ozone decreased significantly during the first 4 years of this period, while after that there is no downward trend. At the same time NOx emissions have gone considerably down until 2000, even when considering the influence of shipping emissions, and decreased much less since 2000. Using various statistical methods the observed development in ozone concentrations could not be explained in view of the NOx emission trends.

The studies indicate that most time series of ozone existing in Europe are not long enough to assess the actual trend in ozone concentrations with sufficient accuracy, due to the large natural meteorological variability; and that the reduction in NOx emissions in the Netherlands and adjoining areas and the lack of parallel reduction in ozone concentrations are at odds.

Session 7 included 3 presentations on examples of combining measurements and modelling in assessments, as well as the presentation on SEIS and the summer ozone web pilot.

Koelemeijer modelled projections of PM10 and NO2 in the Netherlands up towards 2020, based upon scenarios which include European and national policies. The results indicate that average PM10 and NO2 concentrations will be reduced by 4 $\mu g/m^3$ and 6-8 $\mu g/m^3$ respectively towards 2020, and that there will be a substantial and rapid decrease in extent of exceedances, except along highways and roads.

Koen de Ridder's presented first the GMES-Promote project. The Aurora dispersion model and applications for urban areas in Belgium, the Netherlands and the Czech Republic, including model validation efforts based upon measurement data, were presented.

Horalek presented the interpolation mapping methodology developed within ETC/ACC during the later years. The focus was on showing methodologies for uncertainty mapping, as well as mapping of probability for limit value exceedances.

Haigh presented EEA's SEIS (Shared Environmental Information System) plans and the summer ozone web pilot. As part of its 2004 – 2008 strategy, the European Environment Agency increased focus on dynamically presenting environmental data via interactive map based Internet sites. One of the foremost projects offers the possibility to track ground level ozone on a pan-European scale and is commonly known as 'ozone web'. The success of the ozone web is shown by its daily processing of more than 20,000 ozone data, provided from more than 800 stations by 39 providers in 24 countries. A pilot has been set up to test the possibility of using the near real-time data transferred daily to the ozone web as a basis for the summer ozone reporting. The ozone web site and data exchange is cited extensively by a

Commission communication and is seen as a pilot of Shared Environmental Information System (SEIS) concepts.

Concluding remarks

CSI005 (SEBI = biodiversity indicator; SDI = sustainable development indicator):
- 2008 critical loads are now available for updating the ecosystem exposure part of the indicator (adopted by respective bodies under CLRTAP).
- From 2008 onwards the indicator will be updated in close cooperation with the Coordination Centre for Effects (CLRTAP, WG Effects, data centre of the International Cooperative Programme on Modelling & Mapping).

AQ Questionnaire:
- Reporting has been fine though not all Member Countries report (all) voluntary information.
- 22 EU MS responded to a second quality check.
- Highest exceedances of limit values for PM and target values for ozone.
- By far the most zones defined address effects of air pollutants on human health, however, some also address effects on vegetation & ecosystems.
- Traffic, industry & domestic heating have been identified as major sources for major air pollutants.

Summer ozone (pilot):
- Higher numbers of exceedances for near real-time (NRT) data than for 'approved' monthly reporting (= preliminary validated data).
- NRT information is earlier available & thus more timely; informative exercise.
- NRT and officially reported data 'almost identical' or not? This is a topic for the Data Exchange Group, DEG (e.g. resubmission aspects 'if' NRT data will be used in the future).

EoI:
- The number of stations reporting PM2.5 data to AirBase has increased.
- Additional data checks (including also data reported for < 2002) have been introduced (consistency in time series, extreme positive or negative outliers, frequently repeated data, quality checks in DEM itself).
- Information on AirBase data is now available via two web sites (AirBase viewer EEA; informative web site at ETC/ACC).
- Statistics for AOT40 forests and SOMO35 will be calculated in the future.

Country presentations:
- Country or regional studies important for assessing the effects of air pollution!
- For trend analyses not only (recent) number of measurement stations but also length & quality of time series, history of stations important; modelling can/should be used as additional tool.
- General observation: from 2000 onwards no improvement in AQ for PM, O3, NO2 .
- In parts of (central) Europe NH3 emissions have not changed over the last decade (only data for Germany was presented, but it's also true for other countries in Europe).
- The 'concentration cake' background, sub-urban background, hot spots can look different in different cities/agglomerations in Europe (and for the major pollutants); local/regional sources versus long-range/inter-continental transport.
- Increases of NO2 (and PM1.0) levels at traffic sites (due to direct NO2 emissions from diesel cars equipped with PM traps?).
- Topography and meteorology have decisive influence on concentration levels, especially for pollutants formed in the atmosphere (ozone, PM); e.g. inversion

in valleys, differences in dispersion conditions, advection effects, inter-annual variability in meteorology…
- Continuous measurements of the newly introduced average exposure indicator (AEI); 2009 – 2020: difficult to guarantee at urban/urban background stations.
- PM composition can be very different in different parts/regions of Europe (industrial areas (e.g. heavy metals) winter sanding/salting, Sahara dust, marine aerosols, biomass burning, international shipping, re-suspension, precipitation amounts).
- Chemical composition influences also the (choice / calculation of) PM correction factors (e.g. lost of volatile dust during measurement, also dependent on humidity).
- Forecasts of episodes important for early warning and protection of human health (modelling!).

FAIRMODE:
- FAIRMODE has been successfully established as a joint initiative of the EEA and the JRC, strongly supported by DGEnv. FAIRMODE responds to the requirements of the new Air Quality Directive of introducing modelling as a necessary tool for AQ Assessment and AQ Management.
- In order to bring together AQ modellers and model users a Modelling Guidance document is under development, lead by EEA-ETC/ACC. JRC leads the work on model QAQC issues. A respective background document has been drafted.

Long-term trends in ozone concentrations:
- The natural variability in ozone concentrations and ozone metrics due to variations in meteorology are substantial and larger than the expected trend due to emission reductions during 1995-2005 in many European regions.
- The lack of long-term ozone measurement data e.g. in AirBase is a major obstacle for trend evaluations. With the present amount of ozone data the assessment has to be restricted to certain parts of north and central Europe.
- The longest time series do indicate reductions in ozone metrics during 1990-1998 for UK, the Netherlands, in North-Rhine Westphalia (Germany) and to a lesser extent for Austria. After 1998/-99 no clear reductions can be observed. No clear trend is found for Switzerland.
- Model calculations indicate that biogenic isoprene emissions are a major uncertainty factor influencing the AOT40 vegetation index. The uncertainty is smaller for the health index SOMO35

Combination of air quality measurements, modelling and remote sensing:
- Modelled projections of PM10 and NO2 in the NL, for scenarios including European and national policies, indicate that average PM10 and NO2 concentrations and limit value exceedances will be reduced significantly towards 2020, except along highways and roads.
- GMES-PROMOTE project: modelling with The Aurora dispersion model has been successfully used for AQ forecasts, assessments and scenario analyses on a country and city level.
- Interpolation mapping methodologies developed within ETC/ACC, using measurement data and supplementary information as a basis have successfully been used for compiling pan-European AQ maps, uncertainty mapping and indicating the probability of limit value exceedances in different European regions.

- The ozone web site hosted by EEA is a successful example of Shared Environmental Information System (SEIS) concepts, that can also be used for official summer ozone reporting.

Contents

INTRODUCTION

The presentations and background documents at the workshop can be found at this link: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/meeting080929.html
Abstracts from the presentations have been included in the sections below; please consult the slides in the web link above for details of the presentations.

Web links to each presentation are also included under each presentation abstract. Do revisit them, there is lots of information there.

A section summary is presented at the start of each section chapter. Discussions, questions and answers are also summarised.

Welcome address by host

Marie-Rose Van den Hende, VMM

Marie-Rose Van den Hende from the Flemish Environment Agency (VMM) welcomed the workshop participants to Bruges. Marie-Rose gave a short introduction to the work and mandate of the Flemish Environment Agency, specially related to air quality, and to the major air quality challenges the region faces presently as well as the agency's approaches to reduce them.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/00_Welcome_Vmm_13thEIONET_AQ080929.pdf

Welcome, scope and goal of the meeting

Aphrodite Mourelatou, EEA

Aphrodite Mourelatou, from the European Environmental Agency, welcomed the workshop participants and thanked the VMM to host the 13th EIONET Workshop. Aphrodite presented the main goals of the workshop; updated the participants on the EEA's recent/upcoming products and gave a short introduction to the EEA's new strategy (2009 2013) within Ambient air quality. She also demonstrated to the participants how to find EEA's Management Board members (from each member country) and the ETC/ACC colleagues using the EEA's/EIONET web pages. The EEA's Air & Transport team was also presented.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/01_welcome_Mourelatou_13_EIONET_080929.pdf

SESSION 1
EEA CORE SET INDICATOR 005

Session chair: Anke Lükewille, EEA

Critical loads of nutrient nitrogen and their exceedances – European perspective

Jean-Paul Hettelingh, CLRTAP/CCE

Extended abstract

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The 2008 European database on spatially specific critical loads and dynamic modelling data (2008 CL-database) is summarized.

The critical load is defined as "A quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge" (Nilsson and Grennfelt, 1988).

Since 1990 the Coordination Centre for Effects (CCE) develops methods and databases for European critical loads under the UNECE-Convention on Long-range Transboundary Air Pollution (LRTAP Convention; www.unece.org/env/lrtap). The 2008 CL-database has been developed following the request of the Working Group on Effects (WGE) at its 26th session (Geneva, 2007) of the LRTAP Convention.

The objective of the 2008 CL-database is to provide effect-based support to European air pollution abatement policies in general and to the revision of the 'Protocol to Abate Acidification, Eutrophication and Ground Level Ozone' in particular. For this, critical loads data are used in integrated assessment models such as the RAINS and GAINS models of IIASA. The 2008 CL-database will also be used to update EEA's AQ Core Set Indicator 005 'Exposure of ecosystems to acidification, eutrophication and ozone'.

The 2008-CL database includes data that were submitted by the CCE's National Focal Centres (see Table 1), while the CCE European background database was used for all European countries that did not submit data[2].

Critical loads for acidification and eutrophication are available for European natural areas that are classified according to EEA's EUropean Nature Information System

[1] Until the end of 2008 also www.mnp.nl/cce will provide the CCE link.
[2] See the CCE Status Report 2008, "Critical load, dynamic modeling and impact assessments in Europe" (*in press)* at www.pbl.nl/cce (or www.mnp.nl/cce until the end of 2008)

(EUNIS), but also for Natura 2000 areas. Work aimed at the protection of natural areas in general and the use of European critical loads and exceedances in particular would benefit from increased collaboration with EEA regarding Natura 2000 habitats and endpoints.

Table 1 Data submissions from countries (denoted with 'X') as a response to the 2007/2008 call for data (Source: CCE Status Report 2008)

	Critical loads			Dynamic modelling
COUNTRY	Acidity	Nutrient nitrogen (empirical)	Nutrient nitrogen (modelled)	
Austria (AT)	X	X	X	X
Belarus[1] (BY)	X		X	
Belgium (BE)	X		X	X
Bulgaria (BG)	X	X	X	
Canada (CA)	X			
Finland (FI)	X	X	X	
France (FR)	X	X	X	X
Germany (DE)	X	X	X	X
Ireland (IE)	X	X	X	X
Italy (IT)	X		X	
Netherlands (NL)	X	X	X	X
Norway (NO)	X	X	X	X
Poland (PL)	X	X	X	X
Romania (RO)	X		X	
Russia (RU)	X		X	
Slovenia (SI)	X	X	X	X
Sweden (SE)	X	X	X	X
Switzerland (CH)	X	X	X	X
Ukraine[2] (UA)	X		X	
United Kingdom (GB)	X	X	X	X
Total	20	13	19	12

The 2008 CL-database is a revision of the 2006 critical load database, which was also used in the review and revision of air pollution abatement policies of the EU. Figure 1 shows that areas with low N-critical loads (red shaded areas) protecting 95% of natural areas in the 2008 CL-Database cover a broader area than in the 2006 CL-Database. Thus, exceedances computed with the 2008 CL-database tend to be higher and are distributed over a wider area than with the 2006 CL-database (see CCE Status Report 2008).

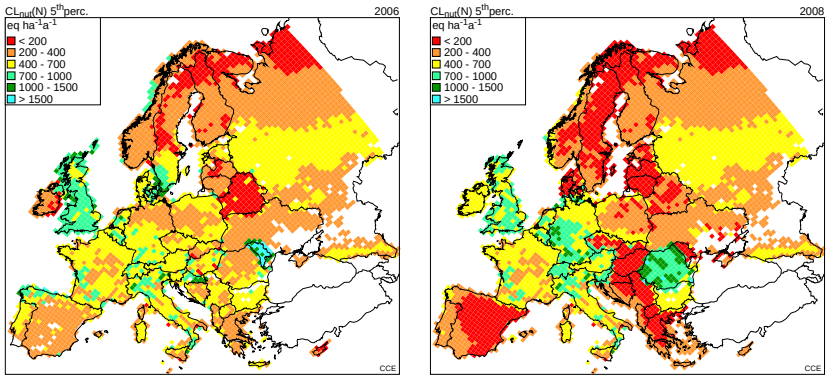


Figure 1. Critical loads of nutrient nitrogen of the 2006 CL-database (left) and the data for the 2008 CL-database (Source: CCE Status Report 2008).

Conclusions and recommendations

- The 2008 critical load database has been adopted at the 27th session of the Working Group on Effects (Geneva, 24-26 September 2008),
- It is now available for use in updating the EEA's AQ Core Set Indicator 005 'Exposure of ecosystems to acidification, eutrophication and ozone' ,
- Other indicators of the effect-based programme of the LRTAP-Convention may be of interest for further collaboration with the EEA, i.e. regarding Natura 2000 habitats and endpoints.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/02_Hettelingh_CCE-CSI_13_EIONET_AQ080929.pdf

Discussion Session 1

Q. There is a distinguished difference at national boundaries in the CL map. (Wolfgang)
R: Countries can choose the ecosystems that they want to protect from AP. They can focus more on one or other, forests, etc. Model methodology may also by difference, for CL defining. They try to harmonise these methodologies, some one NATURA 2000 areas, other consider also other ecosystems.

SESSION 2
AIR QUALITY DIRECTIVES AND DATA FLOWS

Session chair: Sheila Cryan, EEA

Summary of Session 2 and Session 3

Update on the new Directive on Ambient Air Quality and Cleaner Air for Europe, status of implementing provisions and the work of the Data Exchange Group

Andrej Kobe, DG ENV

ABSTRACT

Andrej Kobe[1]
[1]Directorate-General Environment, European Commission, Brussels, EU

European air policy has seen some important developments in the last few years. While the Thematic Strategy on Air pollution in 2005 outlined EU objectives by 2020, the recently adopted Directive 2008/50/EC merged and streamlined the existing directives and introduced new objectives and standards for fine particulate matter $PM_{2.5}$. With the review scheduled in 2013 the focus is now on implementation. Important dates include implementation of $PM_{2.5}$ exposure monitoring in 2009, accreditation of reference laboratories by 2010, and full transposition by June 2010. Ongoing work includes the kick-off of the new Committee under the Directive and its corresponding Working Groups, assessment of notifications on time extensions under Art. 22 (assessment system in place, currently only the Netherlands notified), and enforcement: infringement are ongoing as regards the exceedance of SO_2 limit value, and lack of communication of air quality plans. PM_{10} infringements are announced if the Member States do not notify the request for time extensions by end of October 2008. The Commission is also working on the upgrade of existing guidance documents and on the development of new guidance, in particular on use of provisions related to natural contributions and winter sanding and salting.

Reporting and data exchange are also undergoing a general overhaul. Questionnaire 2004/461/EC has recently been updated to include pollutants covered under the 4th Daughter Directive 2004/107/EC. After reflection following the pilot phase in 2008 the Decision will be formally updated. This is required to cover the interim period before the new Implementing Provisions on reporting enter into force. Implementing Provisions are currently developed by the support of the Expert Group on Data Exchange and are expected to be adopted in early 2009.

Serious abatement efforts are still needed as for example 40% of all zones in EU still exceed the PM_{10} limit value. EU wide initiatives such as INSPIRE, FAIRMODE, GMES and SEIS, in addition to the Community measures addressing emissions at source, are facilitating effective implementation of air policy. EEA is an important partner, in particular through its role as data centre for air, in ensuring that the initiatives are developed to their maximum potential.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/03_Kobe_13_nAQD_EIONET_AQ_080929.pdf

Discussion

During the discussion Andrej Kobe informed that:

- the CG Environment team had been strengthen on air quality management with Alessandro Bertello, national expert from Italy;

- The Directive's Limit values apply everywhere, but do not need to be accessed where people do not live or in the middle of motorways;
- The Directive allows deduction of natural contributions/events, if they can be demonstrated. It is important to know the natural sources, in order to find more effective reduction measures;
- In order to calculate the average exposure indicator for PM2,5, the 3 years average for 2009, 2010, 2011 is being adopted by most countries. The 10 year period is now voluntarily reduced to a 9 year period, since the 2020 indicator with be calculated based on 2018, 2019 and 2020 years average.
- EC is preparing to receive applications on time extension for compliance from specific zones in different countries and guide member states on how to prepare such applications;
- -The EC is working on the reporting provisions for the Directive, so that countries get the necessary guidelines.
- The EC is establishing working groups, including EEA experts, for the revue for the Directive in 2013. At a later stage more involvement of stakeholders is planned. The revision of the Directive in 2013 focus on finding the best indicators/appropriate metrics (ex. PM2,5) that are more relevant for health effects and that force effective measures.
- The DG Environment anticipates that models will take a more preeminent position in air quality management than earlier.
- The DG Environment hopes that the EIONET can continue supporting them on the data exchange work.

Questionnaire, Air Quality Framework Directive: Lessons learned from the last reporting cycle & improvements/new items concerning the current cycle

Edward Vixseboxse, ETC/ACC - PBL

Abstract: 'What's new: AQ questionnaire reporting 2006'

The Air Quality Framework Directive which has been adopted in 1996, describes the basic principles as to how air quality should be assessed and managed in the Member States.

Besides setting air quality limit and target values and the obligation to provide good public information, the objectives of the daughter directives are to harmonise monitoring strategies, measuring methods, calibration and quality assessment methods to arrive at comparable measurements throughout the EU.

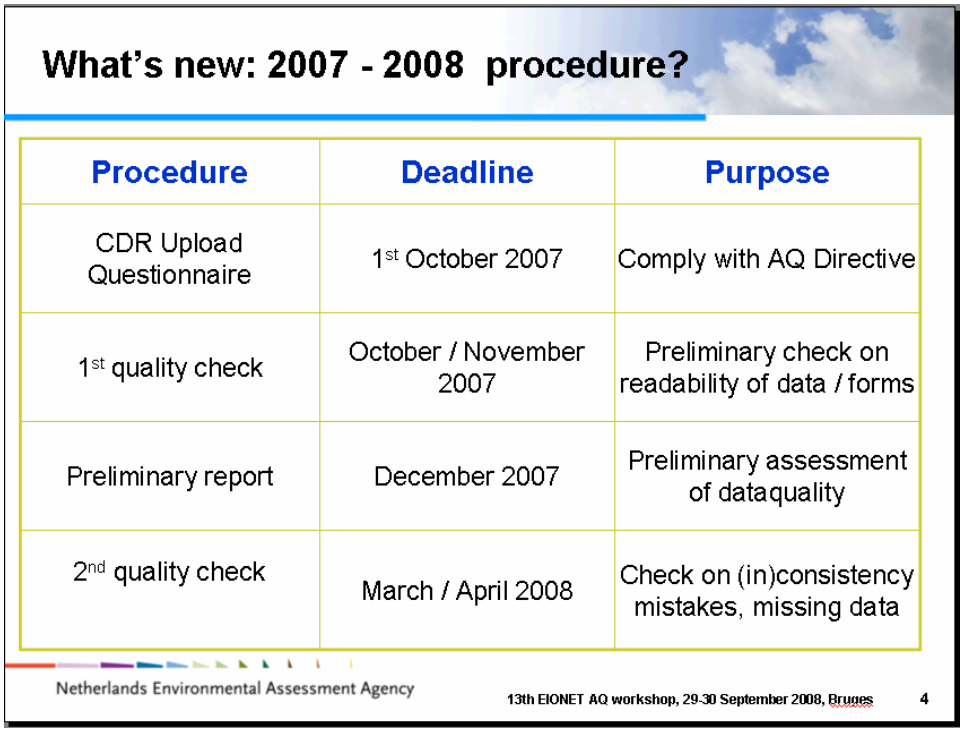
Member States are mandatory to report yearly through the 'Questionnaire' on the air pollution and air quality measurements taken from stations in the zoning of their countries.
The 2006 reporting cycle is the second year that the Topic Centre Air and Climate Change (ETC-ACC) is executing the analysis and reporting the results. 2006 is also the first year that Romania and Bulgaria are reporting to bring the total reporting Member states to 27 and the total reporting number of countries, including Iceland and Norway, to 29.

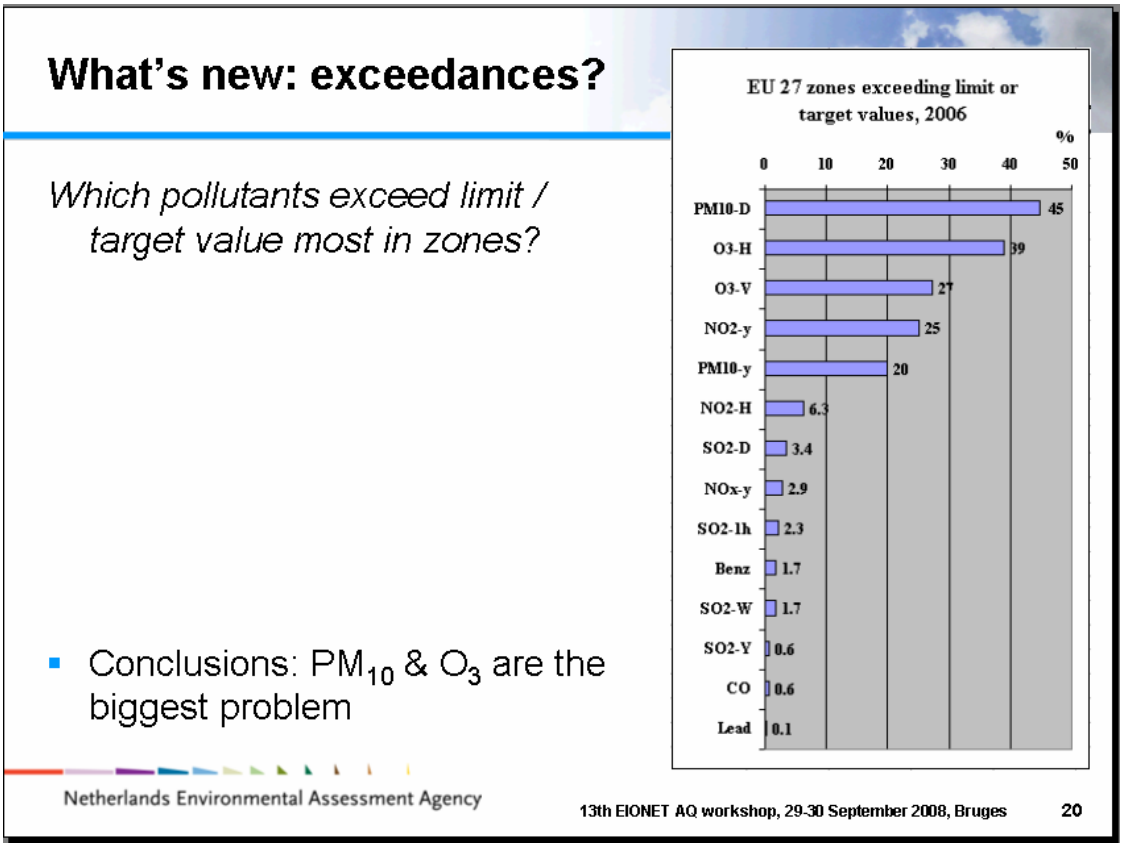
This presentation will focus on the data quality and air quality results of the current 2006 reporting cycle. On the one hand the new procedures to improve the data

quality of reporting will be discussed, on the other hand the results concerning the air quality in the Member States.

New in the 2006 reporting cycle were the introduction of 2 data quality checks and the publication of an interim preliminary report in December 2007.
The 2006 air quality results are characterized by:

- PM_{10} and O_3 are the biggest polluters
- 60% and 50% of the total population is exposed to exceedance in zone of these pollutants
- Local traffic, industry and domestic heating are the main causes of exceedances in zones





Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/04_Vixsebox se_Questionnaire06_13_EIONET_AQ_080929.pdf

Q and A

Q: Is this process now, after this second year, more of a routine with less resources needed? (Cryan)

A: Yes.

Q: What population data are used for estimating population exposure? (Graff)
A: Population data uploaded voluntarily by the countries were used. The data are verified using EuroStat data.

Q: How correct are the station type codes, especially for traffic stations, and does he find any inconsistencies? (Jimenéz-Beltrán)
A: The reported Questionnaire station codes are cross checked with reported AirBase codes by the countries.
Q: Inconsistencies re. no. of exceedance days? (Jimenéz-Beltrán)
A: Not checked for inconsistencies between reported Airbase and Questionnaire exceedances.
Comment: When they (Spanish NRC) check the data they get from the regions, they find a lot of inconsistencies. (Jimenéz-Beltrán)

Q: How to report heavy metal info? (Colosio)
A: HM will be included in new questionnaire forms, but the old forms can also be used.

Clarification: The questionnaires need to be compared to the Airbase, as done for several years. Especially regarding PM10 and PM2.5, it is not sure the same correction factors are used. (de Leeuw)

Exchange of Information (EoI): Lessons learned from the last reporting cycle & improvements/new items concerning the current cycle

Wim Mol, ETC/ACC – PBL

Abstract "Exchange of Information (EoI)"

According to the Directive 97/101/EC on the Exchange of Information (EoI) as amended by 2001/752/EC, the EU Member States have to provide yearly EoI Data on air quality. This data exchange is mandatory for the EU Member States, but other EEA Member and cooperating countries participate on voluntary basis, too.
The European Topic Centre on Air and Climate Change (ETC/ACC) manages the yearly reported EoI data. The ETC/ACC performs several checks on the received data and sends the results to the data suppliers in the form of a feedback report. The data suppliers are asked to respond to these reports.

All delivered data are uploaded into the AirBase database. The contents of AirBase is available at http://www.eea.europa.eu/themes/air/airbase. Background information on AirBase can be found on http://airbase.eionet.eu.int.

The presentation gives information on the EoI2007 and EoI2008 reporting cycles, the feedback activities in 2008 and the developments in AirBase in 2009.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/05_Mol_EoI_13_EIONET_AQ_080929.pdf

Q and A

Comment: The public feedback from AirBase group on mistakes could embarrass the data provider. (Broughton)

Comment to this: Everybody should know the results of the quality check, so that people know what has been done with the data. The point is not the criticize, but have an open evaluation of the data quality available to all and move further towards transparency of reporting. (Cryan)

Report of the informal EoI working group

Joelle Colosio, NRC – France

Abstract "Informal WG on the technical aspects of EoI (linking with INSPIRE, SEIS and GMES)"

The working group was established in March 2008 (Countries participating are: UK, DE, FR, ES and PT) with the mission to identify and evaluate critical issues on the actual exchange of information.

The 1st meeting in Copenhagen focused on calculation methods for EoI statistics.
The 2nd meeting took place in the UK on 27th June and focused on AQ exceedance calculations.
The 3rd and last meeting took place on 4-5 November in Lisbon.

The group has presented a draft report to the DEG and to the 2008 Eionet AQ workshop (29-30 September) . A final report will be delivered by the WG by the end of 2008. France is funding a coordinator for documentation. The outcome of this work will feed in to EEA´s planning and future implementation plans for the ETC ACC. All documents are available on Eionet CIRCA:
http://eea.eionet.europa.eu/Members/irc/eionet-circle/airclimate/library?l=/national_quality/informal_national&vm=detailed&sb=Title

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/06_Colosio_IWG_13_EIONET_AQ_080929.pdf

Q and A

Q: Can you clarify your last point (in slide) "encourage local networks to consult data transmitted by other countries" ? (Fiala)
A: Encourage stakeholders on the use of Airbase.

Q: Mücke (WHO) raised the point that there are 35 MS within EoI, many networks, which are parallel to the AQ networks in the public health sector. How do EEA expect to build in a link to the public health networks, not covered in the legislation now.
A: There are no concrete plans at EEA to introduce such a link. However, it is aimed for a closer cooperation of AQ and health experts at EEA in the future.

Q: What about intercomparisons of the various statistical methodologies for the calculation of indicators? (de Leeuw)
A: Colosio encouraged participants to do calculations with various methodologies to assess for differences in results.

Summary of the EIONET Air Quality 'Questionnaire' workshop (June 2008)

Sheila Cryan, EEA

Abstract: "Technical workshop to support countries in improving the quality of reporting through the questionnaire on air quality assessment and management (2004/461/EC)"

EEA has now been responsible for processing the questionnaire for two years. The questionnaire will be widened to include reporting under the 4th daughter directive. The data collection is one of the Eionet priority data flows. EEA and the Eionet have agreed to improve reporting of the Eionet priority data flows as one of the short term objectives for implementing the Shared Environmental Information System (SEIS). This technical workshop is part of the improvement programme. It provided opportunity for clarification of issues, discussions and training. Papers are available at http://www.eionet.europa.eu/events/AQQ2008TW/. The workshop was held back to back with Training session for User Workshop on GMES Atmospheric Services to facilitate contacts between EIONET and GMES.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/07_Cryan_Questionnaire_ws_13_EIONET_AQ_080929.pdf

Q and A

Q: When will the summary of the workshop come out? We have problems with calculation of exceedances of PM. Belgium regions do it in different ways.
A: It is coming soon.

AirBase Survey (user requirements)

Eva Goosens, EEA

Abstract: "AirBase - Summary of on-line questionnaire results"

In September 2008, an on-line questionnaire was launched with the following objectives:

- *Obtain feedback from air quality monitoring data users concerning the way in which the AirBase data is published on EEA's website*
- *Gather some information on how EEA might be able to improve the future services offered to AirBase users*
- *Assess the usefulness of including other air quality datasets related to AirBase in the EEA data service*

The key observations / conclusions coming out of the questionnaire results were:

- AirBase data are mainly used by AQ monitoring and assessment people (+ public sector and research)
- Both **data downloads and map viewers** are used – with highest interest in data downloads
- **Data quality** is assessed as sufficient by most users although outstanding issues identified
- **Statistics** provided are sufficient for most users

- **Pivot tables** are the least used feature. For most users they contain sufficient queries.
- **Map viewers** are assessed understandable by nearly all users – some issues identified (e.g. refresh time) which will be included in the future work plan
- Inclusion of **information on zones, agglomerations and zones in exceedance** is assessed useful by most users. Work on this will be included in the future work plan
- **Interpolated air quality maps** are assessed useful by most users

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/08_Goossens_AIrBaseQaire_13_EIONET_AQ_080929.pdf

Q and A

Q: How many members/groups were asked to respond? Do you have enough responses as a basis for actions to modify AirBase or would you want to repeat the questionnaire? (Mücke)
A: The percentage of response to the questionnaire has not been calculated. The on-line response service was open for only 3 weeks. Short time. We have a clear general picture of where we stand. What we may miss is the detailed comments of users that use Airbase a lot and can have good detailed inputs. Rather, or in parallel, to the questionnaire I am interested in having in-depth talks with some of the "frequent users" on their points of view on potential improvements. This is more useful.
Comment offered by Cryan: To repeat the customised on-line application is difficult to promise, but there is a document "about air base products" , the last section says that if you have particular requests on help to extract data, please contact the EEA. That may provide special help to a particular user need. So for particular requirements to Airbase data, just contact EEA. We will try to accommodate.

Q: Do the responses include responses from EEA and ETC? (Haigh).
A: We have excluded answers from EEA and ETC. The presented on-line questionnaire results are only coming from the mentioned networks.

Q: Which are the most popular downloads? Do you have numbers of the downloads? (Weber, DGEnv).
A: Yes, we keep the number of the downloads.

SESSION 3
AIR QUALITY DIRECTIVES AND DATA FLOWS (CONTINUED)

Session chairs: Sheila Cryan, Anke Lükewille, EEA

Air pollution by ozone in Europe in summer 2008 – preliminary results

Libor Cernikovski, ETC/ACC - CHMI

Abstract

According to the Directive 2002/3/EC the Member States of the European Union have to provide:

- monthly data: before the end of the following month information on the exceedances of the information and alert thresholds (i. e. 1h maximal concentrations higher than 180 and 240 μg.m^{-3});
- April – September data: not later than 31st October information on the exceedances of long-term objective for the protection of human health (8h daily maximal concentrations higher than 120 μg.m^{-3} and 1h monthly maximal concentrations for all stations.

The data exchange is mandatory for the Member States, but other EEA's member and collaborating countries participate on voluntary basis, too.

The European Topic Centre on Air and Climate Change (ETC/ACC), under the contract to the European Environment Agency (EEA), manages the monthly and summer ozone exceedances data. The detailed check on inconsistencies, potential errors and deviations from the suggested structure is made by ETC/ACC during data processing monthly. The data suppliers are asked to correct inconsistencies and errors (i. e. upload amended reports) in way of feedback reports on CDR (Central Data Repository, http://cdr.eionet.europa.eu).

In order to provide information on running summer ozone concentrations as timely as possible, the summaries of the monthly data provided by the countries are available on the ETC/ACC website http://etc-acc.eionet.europa.eu/databases/o3excess.

The presentation gives information on

- legislation background,
- reporting procedure,
- QA/QC procedures made on delivered information,
- summary information on exceedances of 1h thresholds for period April-July 2008,
- information on merging of the current summer ozone reporting (SOR) and near real-time reporting (NRT, http://www.eea.europa.eu/maps/ozone).

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/09_Cernikovsky_SOR2008_13_EIONET_AQ_080929.pdf

Q and A

Q: There are different objectives between NRT SOR data and official data, why compare exceedances? NRT data is just for informing to the population, and the other reporting is for official reporting for the Commission. (Colosio)
A: The objectives are not so different in this exercise, which is to provide more up-to-date info to the EC to enable to react faster. The Commission does not use the NRT data in order to check compliance, more to follow up what's happening. (Kobe)

Q: Will there be possibility to get in new stations for the NRT O_3 reporting? (Broughton)

A: We have to know about your stations in advance to be able to publish the NRT data. How far in advance do countries know they'll be running a new O_3 stations? (Cryan).

A: We must have very exact meta data info on the stations. In the end of the season I expect to receive a complete list with info on the stations. (Cernikovski).

Discussion Session 3

On Andre Kobe's presentation:

Q: What can be expected from the revision of the directives? It does not give an improvement for human health protection, the limit values are the same. We postponed it 6-8 years for compliance. Why is this Directive relaxed and postponed compared to the former one? (Mücke).

A: The topic has been extensively discussed before. Critics apply to the Commission and not to the legislators. We have not relaxed the Directive. We have maintained the limit values and introduced new ones. We have enabled some more time to comply under strict conditions, but the topic of delay was extensively discussed during the procedures.
MS are required to take all necessary measures in order to comply. Some were not able to do that, maybe lack of measures or not enough knowledge on source apportionment. Some measures have not been delivered to date. 26-27 MS could not comply, they had "good reasons" on why they were not able to comply. The directive tries to show in a transparent way how to deal with the situation. The correct legislation does not relax, it requires that LV are respected, but under some conditions MS can apply for postponing. No postponement is given if the MS has not shown it has done what is possible. The directive has to be transposed into national legislation. (Kobe).

Q: What will the new implementing provisions (IP) mean for the data suppliers? (de Smet).
A: The IP have not been set yet. The DEG Committee will propose under the recommendations of the MS experts. MS's demand an introductory period of 2 years. There will be no dramatic changes, but tools for better QAQC, faster aggregation, more effective data transfer. The goal is to have a more effective data transfer requiring less resources, and with an added value compared to the present situation.

Q. Has the 4th DD come up sooner than planned?

A. Yes, if some MS do the review earlier. We would like it to come ASAP.

Q: More knowledge with more information to get better LV on health effects of HM? (Mücke)
A. There is more data available on health effects of HM. Info on this is still increasing, but if we'll be able to propose LV in a few years is uncertain. (Kobe).
A: The new directive does address this and is a good instrument to protect human health. (Jaroslav adding to the answer to Mücke)

Comment: From next year one has to decide on which stations that will be used to calculate the average exposure indicator for PM2,5. Need info from MS on which stations to use.

On Edward Vixseboxse presentation:

Q (to the audience): Availability of special datasets, exceedances, etc. has been greatly improved. You can for the 1st time download this European dataset.
Are you happy with the streamlined way you're getting? Is it useful? (Cryan).
A: Everybody seems to be happy.

Request (Re. improvement of the questionnaire): what the EC is looking for is the official submission. Would appreciate to drop Andre a line, when MSs have improved the questionnaire, so there is no doubt what is the official submission. (Kobe)

On the EoI presentation:

Q: Back to Hans Guido's comments on the public health networks and their place in national reporting. We have discussed this many times earlier, and it is a request of WHO to improve the way of reporting. EEA is not in the position of including the health networks, because it is on the national level. To try to include networks not now being reported through the EoI is the responsibility of the MS. (Fiala)

A: Encourage MSs to consider including health networks in the reporting on the Questionnaire. Should be as thorough as you can be. (Kobe)

A: This is a topic for more than 10 years now, the connection between the environmental sector and the public health sector. Will have next month a pre-meeting in Madrid with symposium on health with the Environmental and Health Ministers. Could EEA/EC/MSs be there? To formulate this request to the countries, that the MSs should select networks, maybe improve networks. Remember, policy makers are using our reports. We should show that we 'know each other'. All these data can really be used, for assessments etc. (Müche)

On the report from the informal EoI group:

Q: Could the Informal EoI group list (short) 3 main potential improvements. (Kobe)
A: Please wait until after our last meeting, 4-5 November, finalised report then. (Colosio)

Q: This working group is a good initiative on how to improve EoI. Are there plans for to continue this work in 2009? (Berghout)
A: EEA funding was for the 3 meetings. Do MSs think this should continue? Result will be a report with recommendations for how the Eionet wants to continue, so let us see the report first. (Sheila)

On the AirBase review:

Q: How do you look at the agency's reporting back, e.g. the viewer etc. Not good enough, not fast enough, off the track? (Cryan)
A/Q: Pleased with the Airbase view. Are there plans for launching open source software, to enable similar viewers nationally? (Brodowska)

A: all software are in principle open source. Contact EEA on how to do it. (Goosens)
A: we use open source for EIONET. For the dissemination software, they don't always use open source. I would like to come back on this. INSPIRE may help us here. (Cryan)
A: Some countries have specific views on what and how they want to use Airbase. EEA doesn't have a clear view on how people are using the data. Please tell EEA how you use the data or would like to use them, after downloading. (Goosens)
A: Presently there is access through SQL script. Can share various SQL templates/queries. (Fiala)

A: A motive for transferring the dissemination from ETC to EEA website, is to improve systematic across the thematic areas. Will start to combine AP data dissemination with data from other thematic areas. How would you like to see airbase data combined with other thematic data? (later also to other ex-agency areas, such as health). Please let us know. (Cryan)

SESSION 4
COUNTRY PRESENTATIONS WITH FOCUS ON PM AND OZONE

Session chair: Cristina Guerreiro, ETC/ACC - NILU

Summary of session 4

The session included very interesting presentations on the PM, ozone and NO2 status in Germany, Austria, Norway and Spain.

In Germany there are widespread exceedances of the PM10 daily limit value, while the PM10 annual average and NO2 situation is generally OK. There are quite a few ozone exceedances as well. The average rural PM10 is about 16 µg/m³ as annual average, and the increase in cities is about +6 µg/m³, while the traffic sites get an additional +5 µg/m³ as an average. There has been a consistent downward PM10 trend since 2000, at about –10% since then, while recorded emissions are down more than that. The meteorological situations obviously plays a role.

The NO2 fraction of NOx has been increasing, judged to be the result of dieselization of cars as well as particle filter influence.

Rural ozone has shown a decrease in maximum hourly concentration over the later years, while max levels are increasing in cities.

Austria is preparing its PM2.5 monitoring network to determine the Annual Exposure Indicator (AEI) according to the new directive. They are so far planning 17 stations, and includes 6 cities, while the Directive calls for 24 stations. It is considered a problem to run stations undisturbed from now until 2020, since it is

difficult to locate stations such that they are not influenced by changes in near-by areas.

PM2.5 in Austria during 2005-2008 has varied within 16-29 μg/m3 (as annual average), with variations caused mainly by location effects, such as influence from LRT and topographic effects (e.g. valleys).

In Norway, PM10 and NO2 are the most important pollutants, and in the cities the main contributors to this are road traffic (including non-exhaust sources, notably studded tyres use in winter and the associated suspension of road/asphalt dust) as well as small scale wood burning.

Measures include reduction in use of studded tyres, road surface improvements, speed limits to reduce dust suspension, salting and cleaning of roads, clean burning wood stoves and low emission zones (LEZ).

The NO2 problem is expected to increase substantially due to strong dieselization with particle filters.

In Spain the PM concentration has been studied in detail at 34 sites across the country. Rural background PM10 varies within 12-21 μg/m3 (annual average), and PM2.5 within 8-13 μg/m3, with a different spatial variation than PM10. **African dust outbreaks influence the number of exceedances of daily PM10 value**, while this phenomenon increases the annual average PM10 with about 1-2 μg/m3 on the peninsula and up to 4-5 μg/m3 on the Canary Islands.

Source apportionnement has been studied extensively in Spain, see the abstract and the presentation for details.

Trends in air quality in Germany

Arno Graff, NRC – Germany

AIR QUALITY TRENDS IN GERMANY - PM10, NO2 AND OZONE 1995-2007 -

Arno Graff
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Air emissions have decreased since the 1990s in Germany and ambient air quality has improved as well. Exceedances of air quality standards for sulphur dioxide vanished completely. The same holds for lead and benzene. On the other hand ambient air quality standards for PM10 are exceeded at many measuring sites in Germany and this might be the case for NO2 in 2010 if there will be no significant improvement until then. The target values for ozone are exceeded in greater areas of Germany.

Since the beginning of this century, no significant decrease of ambient air concentrations can be observed though emissions have further been reduced. The overall picture is more characterised by inter-annual variations.

Air pollution by PM10 and NO2 is highest in agglomerations and especially at locations that are dominated by a high traffic load. Ozone concentrations are highest

in rural areas. A tendency to higher concentrations of ozone in ambient air is observed in urban areas starting from a much lower lever level than in rural areas. Some aspects of the above mentioned situation will be presented.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/10_GRAFF_DE_13_EIONET_AQ_080929.pdf

Q and A

Remark: Airbase has less stations than you have presented here. Please submit them all! (de Leeuw)

Q: Ozone has a downward trend from 1990, but not since mid 90-ties. Can you say something on the long range contributions from neighbours? (de Leeuw)

A: Calculations of long range contribution are coming. Typically 8-10 µg/m³. With respect to the rural background O_3, we don't have exceedance of 120 mg this year, last year just 1 or 2. They have become rare. High load of O3 in summer time. We no longer have the summer smog as in the 90ties.

PM2.5 measurements strategy in Austria, and PM2.5 levels observed so far

Wolfgang Spangl, ETC/ACC – UBA Vienna

Abstract:

PM2.5 monitoring – legal requirements

Directive 2008/50/EC, Annex V:

- Criteria for minimum number of PM10 and PM2.5 monitoring sites per zone.
- The concentration is above the Upper assessment threshold everywhere in Austria.

The criteria specified in footnotes (1) and (2) give a minimum number of 17 PM2.5 monitoring stations.

The proposal for the *transposition of the new AQD into national legislation* requires 24 PM2.5 monitoring sites. The increase compared to the minimum requirements of Dir. 2008/50/EC is justified by the high pollution level and the topographic and climatic variability of the Austrian territory.

Additional criteria: In each zone with at least 2 PM2.5 monitoring sites, at least one site is to be located

- in urban background
- at a traffic-related hot spot.

Average Exposure Indicator

Article 15.4, Annex III and Annex V give the requirements for monitoring related to the Average Exposure Indicator (AEI): 1 monitoring site per 1.000.000 people, summed over all towns with more than 100.000 inhabitants.

In Austria, all towns with more than 90.000 inhabitants are taken into consideration (Vienna, Graz, Linz, Salzburg, Innsbruck, and Klagenfurt), and in each of these towns a background monitoring site for the average exposure indicator is to be operated.

Measurements for the AEI start in 2009, because the AQ monitoring networks were not able to find appropriate urban background monitoring site earlier (two sites have/had to be relocated in 2008). Therefore, the first assessment period will be 2009-2010.

There a quite stringent requirements for the AEI monitoring sites:

- continuous operation in the period between Jan. 2009 and end of 2020
- continuous (high) data quality
- no changes of local environment (local emissions) in this period.
- In case that the monitoring site has to be relocated during this period, it has to be replaced by another site, the equivalence of which has to be proved by parallel measurements.

PM2.5 concentrations observed in Austria.

The table gives the annual mean PM2.5 concentrations at Austrian monitoring sites available in the years 2005 to 2007, and the annual average of the daily PM2.5/PM10 ratio.

The measurement data of PM2.5 show – quite similar to PM10

- large inter-annual variations
- large geographical variations: rural background concentrations in eastern Austria almost reach urban concentrations in western Austria
- very high concentrations in southern Austria (Graz, Klagenfurt).

PM2.5/PM10 ratios are highest at rural background sites and lowest at urban traffic sites. The inter-annual variation of the mean PM2.5/PM10 ratio is small.

From these sites, only Innsbruck is a designated AEI monitoring station.
Two urban background sites (Klagenfurt Koschatstraße and Wien Währinger Gürtel) have to be relocated this year because of construction works on their premises.

The PM2.5 concentration averaged over the (few) urban background sites was 23 µg/m³ in 2005, 24 µg/m³ in 2006 and 18 µg/m³ in 2007.

		2005		2006		2007	
Monitoring site	Site Type	PM2.5 (µg/m³)	PM2.5/ PM10	PM2.5 (µg/m³)	PM2.5/ PM10	PM2.5 (µg/m³)	PM2.5/ PM10
Graz Süd	Urban industrial					25	70%
Illmitz	Rural background	22	80%	21	81%	16	77%
Innsbruck Zentrum	Urban background	21	73%	24	73%	18	72%
Klagenfurt Koschatstr.	Urban background					18	79%
Klagenfurt	Urban traffic	23	71%	29	73%	22	66%

Völkermarkterstr.							
Linz Neue Welt	Urban traffic, industrial	24	72%	25	65%	20	72%
Salzburg Rudolfsplatz	Urban traffic	26	78%	28	73%	21	74%
Wien Taborstr.	Urban traffic					21	70%
Wien Währinger Gürtel	Urban background	24	76%	23	73%	18	73%
Zöbelboden	Rural background mountain	9	85%				

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/11_Spangl_AT_PM2.5_13_EIONET_AQ_080929.pdf

Q and A

Comment on the difficulty to maintain stations over the full period until 2020: Nearby construction obviously represents such a difficulty. (Broughton)

Status of PM_{10} measurements and the most important initiatives the Norwegian municipalities apply for meeting the legislative requirements

Hildegunn Jablonska, NRC – Norway

Abstract

In Norway particulate matter and nitrogen dioxide are the most important components of local air pollution, although other components also contribute to poor local air quality. Road traffic is the dominant source of local air pollution although wood-burning also makes a substantial contribution to the concentration levels of particulate matter in the winter months. NO2 also has exceedances in some cities in Norway. Measures implemented by the municipalities aim to reduce the use of studded tires, improve road surfaces, introducing environmental speed limits during winter months and cleaning and salting of selected roads. Oslo city has partly refunds for replacements of old polluting wood-burning stoves. Cities are also now given the opportunity to implement Low Emission Zones.

NO2 has not had the anticipated reduction the last decade despite the regulations on emissions of NOx. This is attributed mainly to the increasing percentage of diesel powered engines for passenger cars and due to a higher estimated NO2 fraction of NOx from heavy duty vehicles and it seems also for light duty vehicles.

The last calculations done by NILU where the main alterations in the scenario calculations are an updated vehicle composition and a change in the percentage of NO2 in emitted NOx from heavy duty vehicles. The results show a substantial change in calculated exposed number of people above the yearly average 40 µg/m3. Since the concentrations in the calculations made by NILU show to be highly sensitive to these

changes, these factors need to be taken more into account when assessing and implementing measures to reduce local NO2 concentrations.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/12_Jablonska_NO_EIONET_AQ_080929.pdf

Q and A

Q: What is known about the influence of sanding and cleaning on near-road PM concentrations? (Spangl).
A: There is definitely influence, and this varies from city to city, depending upon the sanding and cleaning practices.

PM measurements, characterization and source apportionment in Spain

Xavier Querol, NRC – Spain

Abstract:
PM measurements, characterization and source apportionment in Spain

Querol X.[1], Alastuey A.[1] , Moreno T.[1] , Viana M.[1], Pey J.[1], Jimenez S.[2] Pallarés M.[3], González-Ortíz A.[2], Alonso N.[2], Fernández-Patier R.[3], García Dos Santos S.[3], Herce M.D.[3]

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[3]Instituto de Salud Carlos III, Madrid

This presentation summarises the technical and scientific tasks performed on the measurements, characterization and source apportionment of PM in Spain in the last years. First the measurement instrumentation used for PM monitoring in Spain is presented. The strategies for the correction of real-time instrumentation are shown with the main problems and solutions presented.

The results of measurements and PM speciation studies performed at 37 monitoring sites (at least on an annual basis, but in some cases with 8 years for speciation and 12 years for measurements) across Spain are summarised. Data on PM levels, speciation, levels of around 40 trace elements, and source apportionment are presented.

Average levels of PM_{10}, $PM_{2.5}$ and PM_1 and chemical composition in Spain show significant variations across the country, with current PM_{10} levels at several industrial and traffic hotspots exceeding recommended pollution limits. PM_{10} and $PM_{2.5}$ concentrations reach 14-22 $\mu gPM_{10}/m^3$ and 8-12$\mu gPM_{2.5}/m^3$ in most rural/regional background sites, 25-30PM_{10}/m^3 and 15-20$\mu gPM_{2.5}/m^3$ in suburban sites, 30-46 $\mu gPM_{10}/m^3$ and 20-30$\mu gPM_{2.5}/m^3$ in urban background and industrial sites, and 46-60$\mu gPM_{10}/m^3$ and 30-35$\mu gPM_{2.5}/m^3$ heavy traffic hotpots.

Based on 2001-2005 Airbase data (http://air-climate.eionet.europa.eu/databases/airbase/index_html), regional background levels of PM measured in Spain are intermediate when compared with the low levels recorded in the Scandinavian countries (7-12 μgPM_{10}/m^3) and the higher levels recorded in central Europe (The Netherlands as an example recorded in regional background sites for 2001-2005 25-34 μgPM_{10}/m^3). When evaluating PM_{10} levels from the EMEP stations it is evidenced that the levels recorded in the Atlantic and Central regions of Spain are relatively low (12-14 μg/m^3 recorded as mean levels), whereas those recorded in the Southern regions are higher (18 and 21 μg/m^3). Levels measured at the Eastern side of Iberia are intermediate (16-17 μg/m^3, for most stations). This distribution is possibly caused by the progressive higher frequency and intensity of African dust outbreaks and low rainfall from the Atlantic regions to the Eastern and to Southern regions of Iberia.

Concerning $PM_{2.5}$, the mean annual levels range from 8 to 10 μg/m^3 in the Atlantic and Central Spain, from 10 to 11 μg/m^3 in Southern Spain and from 8 to13 μg/m^3 in Eastern Spain. It is clear that PM_{10} and $PM_{2.5}$ do not follow the same spatial variations over Spain. Thus, the highest $PM_{2.5}$ levels are recorded in regions from Eastern Iberia with high anthropogenic emissions, followed by sites from Southern Iberia, where probably the African dust has a higher incidence on $PM_{2.5}$ levels. Most of the remaining monitoring sites record levels close to 8μg/m^3.The ratio $PM_{2.5/10}$ reaches the lowest values in the Canary Islands and Southern Iberian Peninsula, with 0.4 and 0.5, respectively. In most of the other areas of the Iberian Peninsula the $PM_{2.5/10}$ ratio ranges 0.6 to 0.7, with the exception of the industrialized regions (such the Barcelona region), where the regional background ratio reaches 0.8 (Montseny). PM_1 levels in regional background are continuously measured at Montseny since 2002, with a mean annual level of 11μg/m^3. The $PM_{1/2.5}$ ratio reached 0.8 constantly as an annual mean value for each of the 6 years of measurement. Similar $PM_{2.5}$ levels and $PM_{1/2.5}$ ratio were reported for a rural site in Northwest Spain (Salvador et al., 2006).

Spatial distributions show sulphate and carbon particle levels reaching maxima in industrialized areas and large cities (where traffic emissions are higher), and nitrate levels increase from the Atlantic to the Mediterranean (independent of the regional NOx emissions). African dust outbreaks have an influence on the number of exceedances of the daily limit value, additionally load on the mean annual PM_{10} levels ranges from 1-2 μg/m^3 in most areas of the Iberian Peninsula to 4-5 in the Canary and Balearic Islands and the southern ends of Iberia.. The marine aerosol contribution is near one order of magnitude higher in the Canaries and the Atlantic coast of Iberia compared to the Mediterranean regions. Important temporal influences include PM intrusion events from Africa (more abundant in February-March and spring-summer), regional scale pollution episodes, and weekday vs. weekend activity. Higher summer insolation enhances sulphate but depletes particulate nitrate (as a consequence of the thermal instability of ammonium nitrate in summer) and Cl^- (due to HCl volatilisation resulting from the interaction of gaseous HNO_3 with the marine NaCl), as well as generally increasing dry dust resuspension under a semi-arid climate.

Trace element concentrations in PM_{10} and $PM_{2.5}$ were determined at 33 monitoring stations in Spain throughout the period 1995-2006. Industrial emissions from different forms of metallurgy (steel, stainless steel, copper, zinc), ceramic and petrochemical industries were evaluated. Results obtained at sites with no significant industrial impact allowed us to define usual concentration ranges for a number of trace elements in rural and urban background environments. At industrial and traffic hotspots average trace metal concentrations were highest, exceeding rural

background levels by even one order of magnitude in the cases of Cr, Mn, Cu, Zn, As, Sn, W, V, Ni, Cs and Pb. Steel production emissions were linked to high levels of Cr, Mn, Ni, Zn, Mo, Cd, Se and Sn (and probably Pb). Copper metallurgy areas showed high levels of As, Bi, Ga and Cu. Zinc metallurgy was characterised by high levels of Zn and Cd. Glazed ceramic production areas were linked to high levels of Zn, As, Se, Zr, Cs, Tl and Pb. High levels of Ni and V (in association) recorded at one site under the influence of heavy vessel traffic could be considered tracers (although not exclusively) of shipping emissions. Levels of Zn-Ba and Cu-Sb were relatively high in urban areas when compared with industrialised regions due to tyre and brake abrasion, respectively (Querol et al., 2007).

Source apportionment studies have been carried out in a lot of monitoring sites in Spain using mainly PCA and PMF tools, and CMB in a much lesser extent (Viana et al., 2007). The results from our studies show that, as expected, the contribution of the different sources is highly variable according to the type of sampling station. The results obtained at the sites in the Iberian Peninsula are also very different from those obtained in the Canary Islands. Traffic contributions to PM_{10} levels at urban background stations in the Peninsula vary from 21 to 34% (6–15 μg/m³), but may reach 48% (23 μg/m³) at traffic sites. This contribution reaches only 5% (2 μg/m³) at the urban background site in the Canaries. Traffic contributions attain 11–25% of the PM_{10} levels (3–5 μg/m³) at the rural stations in the Iberian Peninsula. The industrial factor also exhibits important variations as a function of the study area. In the Peninsula, this contribution at urban background stations under industrial influence ranges from 20 to 44% (9–20 μg/m³). At rural sites with industrial influence, these contributions account for 15–25% of the PM_{10} mass (3–6 μg/m³). In the Canaries, industrial emissions only account for 10% of the PM_{10} mass (4.5 μg/m³). This contribution is similar to that determined for the external anthropogenic emissions (10%). A detailed chemical and physical characterization of road and demolition dust is being carried out in around 25 sites in the city of Barcelona. This will allow applying the CMB in this area in the near future.

Acknowledgements: This study was supported by research projects from the D.G. de Calidad y Evaluación Ambiental from the Spanish Ministry of the Environment and the Plan Nacional de I+D from the Spanish Ministry of Education and Science (CGL2004-05984-C07-02/CLI, CGL2005-03428-C04-03/CLI)., and research contracts supported by the Autonomous governments of Catalunya, Valencia and Andalucía.

Querol X., Viana M., Alastuey A., Amato F., Moreno T., et al. (2007) *Atmos. Environ.*, doi:10.1016/j.atmosenv.2007.05.022
Salvador P., Artíñano B., Querol X., Alastuey A., Costoya M. (2007). *Atmos. Environ.*, **41**, 1–17.
Viana M., et al. (2007 submitted). *J. Aersol Sci.* An overview of source apportionment studies in Europe.

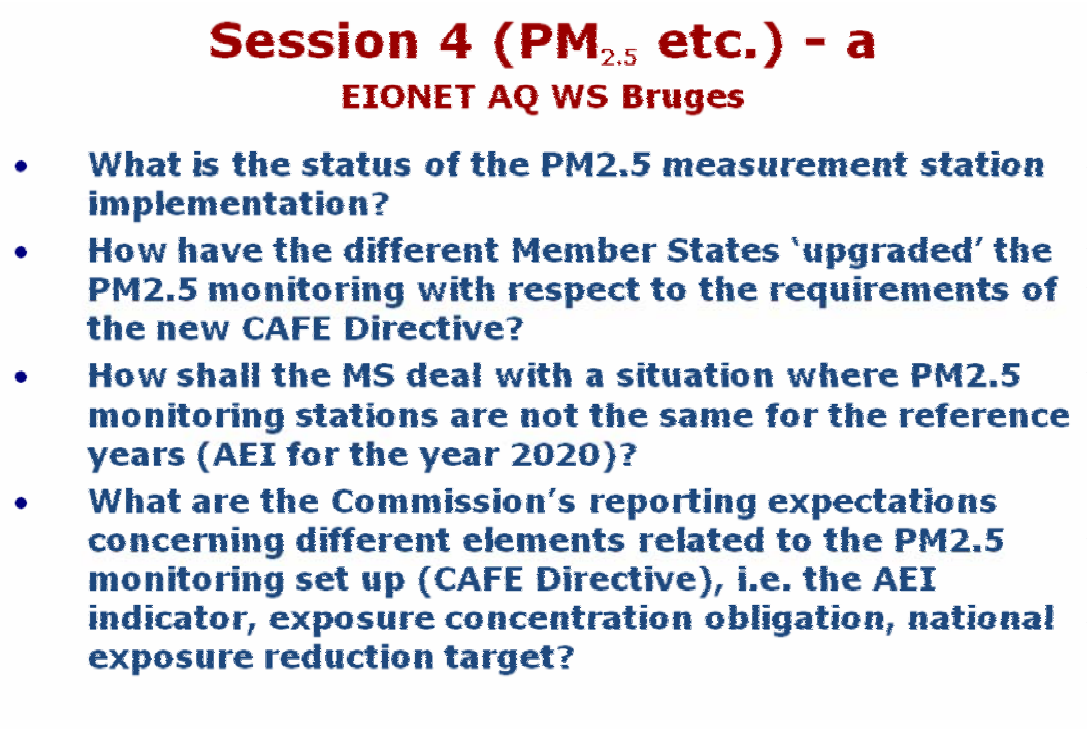
Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/13_Querol_ES_13_EIONET_AQ_080929.pdf

Q and A

Q: How often do you determine the correction factors for PM samplers?

A: Twice a year.

Discussion Session 4



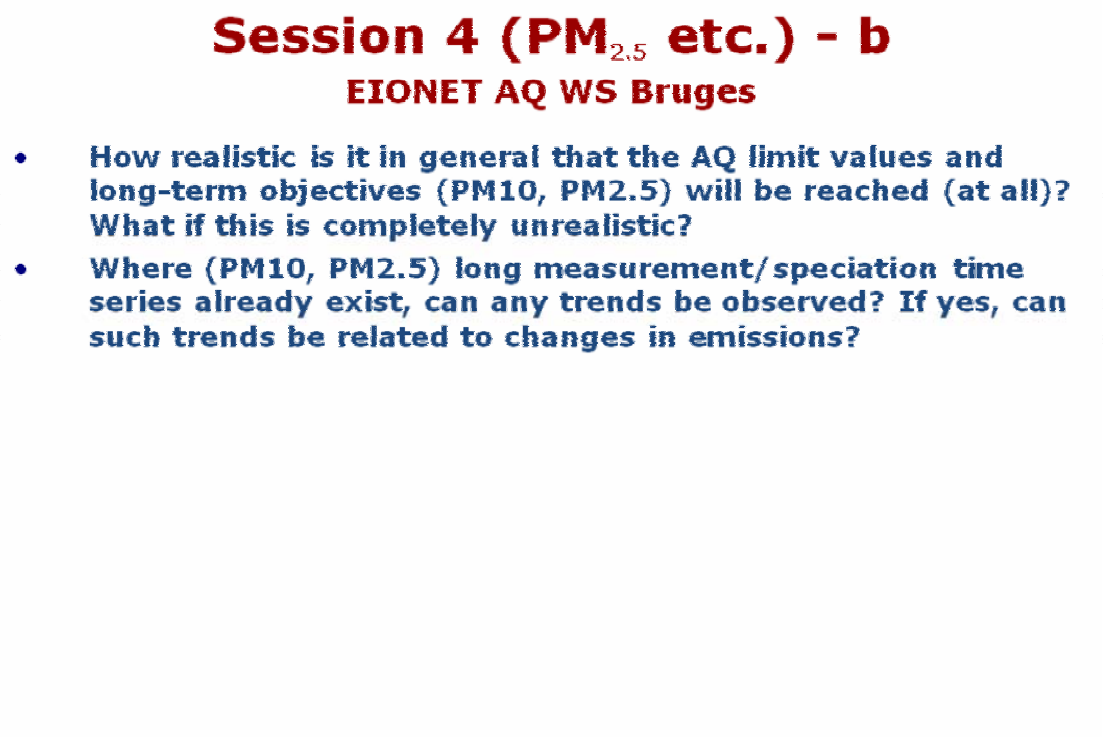
Jimenez: Spain will implement the first PM2.5 exposure network in Spain. Mix of methods. Will establish CFs. Will start in 2009. Harmonized this network for the first time.

Mücke: how about the QAQC with PM2.5? Harmonization of PM2.5 measurements?

JRC AQUILA: We have done a comparison study over many countries in Europe and recommend the reference method.

Berkhout: Most PM2.5 are gravimetric. Stricter QA/QC regime. Examination of data shows: Filter material increases weight on filter during lab procedure, absorption of water vapour. Difficult to get correct data.

JRC: CEN WG: They are running an evaluation program now for QA/QC for PM2.5.



Spangl: How to reach PM10 LVs? PM10 has been measured since 1999. Trends are affected by many factors, not least the LRT. We don't know emissions well enough to get emission trends, like fugitive dust, etc. Fine particle emissions are fairly well known, but coarse emissions are not well known.

Kobe: LVs are realistic, the policy maker society agree on that. They can/should be met, or a delay given, but measures need to be taken.

De Leeuw (on the realism of PM LVs): we have made health impact calculations. Scenario calculations show that the LV can be met everywhere in Europe. Only a few areas cannot be met.
Can trends be determined? There is no trend in PM10 in Airbase. What is happening?

Graff: has to take out ammonia. Measures must work on larger areas, not just for 'points'. The question of representativity of measurement points is a fair question.
Andre: The EU objective is to half the deaths due to AP by 2020. There is a new EC action plan coming.

SESSION 5
FAIRMODE, FORUM FOR AIR QUALITY MODELLING

Session chair: Anke Lükewille, EEA

Update: Activities of the Forum for Air quality modelling (Fairmode)

Anke Lükewille, EEA

ABSTRACT

FAIRMODE is a joint initiative of the European Environment Agency (EEA) and the EU Commission's Joint Research Centre (JRC). The network aims at responding to the requirements of the new Air Quality Directive (AQD; adopted in April 2008) with a particular focus on the promotion of modelling as necessary tool for air quality assessment and management. The objective is to bring air quality modellers and model users in EU Member States and EEA Member Countries (EIONET network) together.

Two working groups (WG) have been established: WG1 to provide guidance to model users (led by EEA-ETC/ACC), i.e. support the use of air quality models as a major input to the revision of reporting under the AQ directives. The second WG (led by JRC) focuses on quality assurance of models, i.e. model validation methodologies, inter-comparisons and exchange of best practices.

The FAIRMODE network is led by a Steering Committee jointly chaired by the EEA, JRC and DG Environment (DG ENV). Furthermore, the Committee comprises of two ETC/ACC colleagues, five EIONET model users and five modelling experts (for details please see FAIRMODE's web portal: http://fairmode.ew.eea.europa.eu/).

FAIRMODE is meant to be a long-term activity, strongly supported by DG ENV. DG-ENV will appropriately include FAIRMODE deliverables within the AQD implementation framework, i.e. via acceptance by the Commission, proposing endorsement by the respective Committee, proposing modifications of AQD Annexes and steering of Community action (Kopernikus). The Commission will prepare for qualitative changes in assessment requirements in 2013 (revision of AQD). DG-ENV considers the 'twin management' character (JRC/EEA-EIONET) pivotal for success.

WG1's major activity in 2008 is the preparation of a guidance document for the use of AQ models by EEA-ETC/ACC. The major aim of this document is to:

- Provide guidance for the use of air quality modelling in regard to the new air quality directive (and the 4th Daughter Directive);
- Promote best practices in air quality modelling and assessment;
- Provide a centralised forum and reference point for the application of models in regard to the air quality directive.

JRC is preparing a Scoping Paper for WG2. The main aims of this document are to:

- Provide background information on compliance related aspects of the model quality assurance procedures;

- Define the objectives of WG2 activities;
- Propose a methodologies and relevant issues to be discussed at the meeting.

The FAIRMODE kick-off plenary meeting took place on 10th October in Cavtat, Croatia, following the 12th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes (HARMO, 6th – 9th October 2008).

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/14_Luekewille_13_EIONET_AQ_080930.pdf

Fairmode: The air quality modelling guidance document

Bruce Denby, ETC/ACC - NILU

Guidance document on the use of models for the European air quality directive: an activity of FAIRMODE

Bruce Denby[1], Steinar Larssen[1], Cristina Guerreiro[1], John Douros[2], Nicolas Moussiopoulos[2], Lia Fragkou[2], Michael Gauss[3], Helge Olesen[4], Ana Magarida Costa[5]

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[4] NERI, Denmark
[5] University of Aveiro, Portugal

FAIRMODE (Forum for AIR quality MODelling in Europe) is established as a joint initiative of the European Environment Agency (EEA) and the European Commission's Joint Research Centre (JRC), in a common effort to respond to the requirements of the new Air Quality Directive (AQD), focusing on the introduction of modelling as a necessary tool for Air Quality Assessment and Air Quality Management. The main aim of FAIRMODE is to bring together air quality modellers and model users in order to promote the harmonised use of modelling for the assessment of air quality by EU member countries.

The initial activities of FAIRMODE are organised into two working groups. The first of these working groups is engaged in the preparation of a guidance document for the use of models. The major aim of this document is to provide guidance for the use of air quality modelling in regard to the new air quality directive (and the directive on heavy metals in ambient air) but also to promote best practices in air quality modelling and assessment and to provide a centralised forum and reference point for the application of models in regard to the air quality directive.

The guidance document is currently being developed and covers a number of topics, many of which are illustrated with relevant examples, links and references. The presentation will describe the general aim and outline of these topics, and illustrate these with some direct extracts. It is intended that the guidance document be developed with the participation of institutes directly involved in the reporting of air

quality to the European commission, in particular those using models. Discussion is encouraged.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/15_Denby_FAIRMODE_13_EIONET_AQ_080930.pps

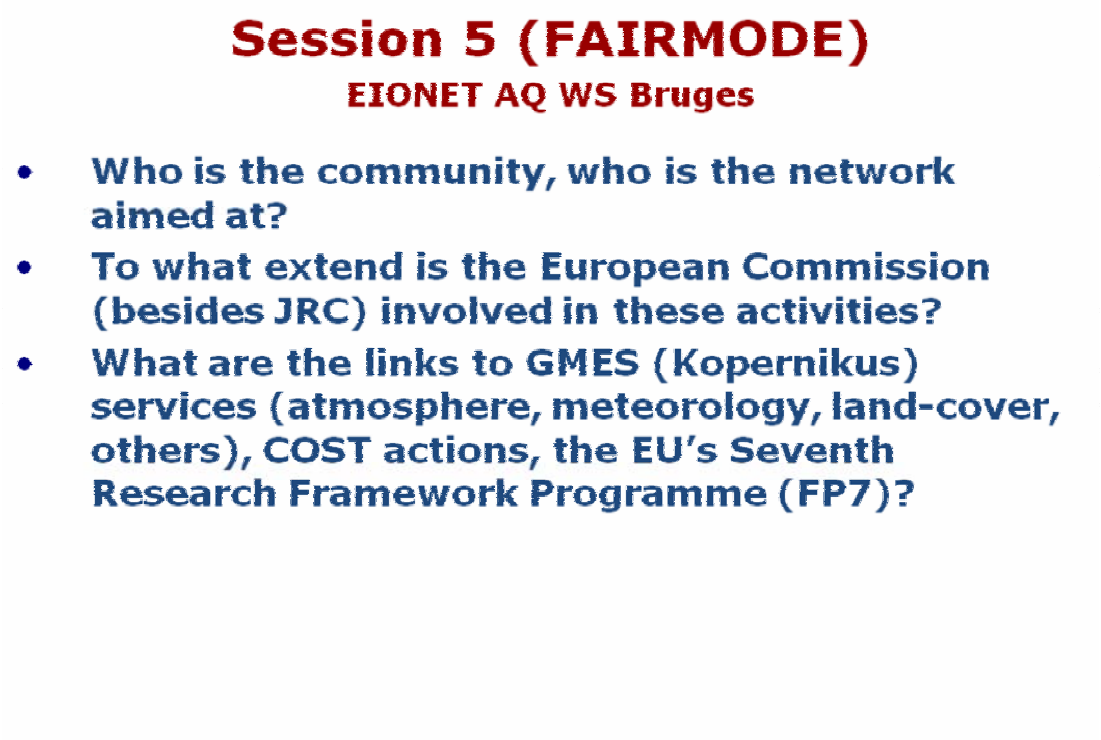
Q and A

Q: How do you define or specify modelling procedures? It is difficult to ask people to do modelling, since uncertainty is not specified anywhere? There is no procedure or guidance at the moment. (Rijs).
A: Uncertainty of models is possibly the main aspect of modelling guidance. Two aspects on the uncertainty: compare with the measurements. You have to show you fulfil the requirement of the Directive. When it comes to real uncertainty, this is a much a larger field of work. WG2 of FAIRMODE is solely looking at that aspect.

Q: Will the guidance help us? (Rijs).
A: There are no magic solutions. Monitoring has a longer history in air quality management than modelling. FAIRMODE is to bring the quality aspect of modelling further. In the guidance manual, we try to have some references one can work against. But for each use, validation is necessary.

Q. Where will this document be? (Rijs)
A. On a website. It is not open yet.

Discussion on Session 5



Q: The model system, the MDS: does that go into Fairmode? (Cryan)
A: Yes.

SESSION 6
LONG-TERM TRENDS IN OZONE CONCENTRATIONS IN EUROPE

Session chair: Anke Lükewille, EEA

Trends in ground-level ozone concentrations in Europe

Sverre Solberg, ETC/ACC – NILU

Abstract

ETC/EEA technical report, final draft recently distributed for EEA/EIONET review

Authors: Sverre Solberg, Jan Horalek, Jan Eiof Jonson, Steinar Larssen, Frank de Leeuw

(with valuable comments from Dick Derwent, Michiel Roemer, Anke Lükewille)

An assessment of surface ozone recently carried out and distributed for EIONET/EEA review is presented. The main purpose is to provide an assessment of surface ozone within the EEA Member Countries with focus on long-term trends.

Main questions include the magnitude of ozone trends to be expected; this magnitude relative to the natural variability; if there is a discrepancy between the trends in emissions and the trends in observed ozone; what criteria this sets on the observational time series; and the role of sources outside European control.

The natural variability in AOT40 and other ozone metrics due to variations in meteorology was found to be substantial and larger than the expected trend due to emission reductions during 1995-2005 in many regions. Furthermore, the lack of long-term ozone measurement data in AirBase is a major obstacle for trend evaluations. With the present amount of ozone data the assessment has to be restricted to certain parts of north and central Europe. The longest time series do indicate reductions in ozone metrics during 1990-1998 for UK, the Netherlands, and to a lesser extent for Austria whereas it is more variable after 1998/-99. No clear trend is found for Switzerland. Model calculations indicate that biogenic isoprene emissions is a major uncertainty for the vegetational index AOT40 with a factor of 2 or more. The uncertainty is smaller for the health index SOMO35.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/16_Sverre_O3trends_13_EIONET_AQ_080930.pdf

Are observed ozone trends in line with emission changes?

Michiel Roemer, ETC/ACC – TNO

Abstract

Over the last two decades the European countries have implemented measures to reduce their emissions of NO_x, SO_x, NMVOC and NH_3 in order to diminish the nitrogen and sulphur fluxes to ecosystems and to reduce the exposure of ecosystems and humans to harmful ozone concentrations. The National Emission Ceilings Directive sets emission targets for Member States, which in many cases imply reductions in the order of 50 percent over the period 1990-2010. In this study the developments of episodic ozone concentrations have been studied in relation to the developments of NO_x emissions and concentrations.

Data was collected from more than 30 stations in The Netherlands, Flanders and the neighbouring German province Northrhein-Westphalia. The emphasis in this study is on episodic ozone given the fact that a large portion of it is made by European emissions and it is therefore less sensitive to changes and variations of background ozone concentrations.

Simple linear regression have been performed on time series of different length. The longest time series is from 1992-2007 and shows for nearly all sites downward trends. If however, the first four year are taken out of the regression, then for more than half of the sites the trend is turned into a neutral or even upward direction. Linear regression is not a very robust parameter since it is sensitive to shifting the time frame with a few years back and forth.

A more sophisticated approach is employing a regression model that incorporates the ozone fluctuations caused by the meteorological variability. By including temperature and humidity terms the regression model captures about 80 percent of the observed ozone variations. An analysis of the so-called residuals (the difference between observed and modelled ozone concentrations) reveals that the years 1992-1995 display elevated ozone concentrations, but that starting from 1996 till 2007 there is little trend discernable. This is seen in both Dutch as German sites. The question arises what has caused the stabilisation of high ozone concentrations.

A candidate to consider is whether or not the NO_x emissions might have levelled off. According to the Emission Inventories land based NO_x emissions have been reduced quite strongly during the 1990s, and they have continued to decrease in the 2000s but at a slower pace. Given the strong increase of ship-emissions, the total NO_x emissions of EU27+2+ships shows a considerable downward trend in the 1990s and much less since 2000.
Looking at the NO_x emissions of The Netherlands, Belgium, Germany, France and the UK the trend is also in the 2000s downward with reductions in 2006 (as compared to 1990) ranging from -50% to -35%.
By combining a dispersion model with NO_x observations it became clear that the trend in the emissions was nicely reflected in the observations, in other words: it proves that also in the 2000s there has been a further reduction in NO_x.

The conclusion is that developments in NO_x cannot explain the lack of ozone trend since 1996. So, other mechanisms need to be considered. Trends in VOC (the other ozone precursor) is first candidate for examination, which also need to be viewed in relation to the biogenic VOC emission.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/17_Roemer_O3_NL_13_EIONET_AQ_080930.pdf

Q and A

Comment offered by Spangl: Austria had for many years a significant trend on annual mean values and increase in rural stations. High percentages did not increase significantly. Seasons increase? Well, not in autumn. Decreasing NOx emissions do not influence the ozone trends. They cannot explain their ozone trends.

Discussion Session 6

Q: Years ago Austria had a significant trend on annual mean values and increase observed at rural stations. High percentiles did not increase significantly. (Wolfgang)

SESSION 7
COMBINATION OF AIR QUALITY MEASUREMENTS, MODELLING AND REMOTE SENSING

Session chair: Tim Haigh, EEA

The use of measurements and models in the Netherlands to check compliance with limit values

Robert Koelemeijer, ETC/ACC – PBL

Abstract

In the past years, air quality has been high on the Dutch political agenda. One of the reasons is that the Netherlands is among the regions in Europe with relatively poor air quality, raising concerns about public health and ecosystems. Another reason is related to the fact that possible exceedances of (future) air quality limit values have been a reason for the Dutch court of justice to reject plans for new spatial developments (road infrastructure, permits for industry). This has formed a trigger to formulate additional air quality policies, as well as scrutinize methods to measure and model air quality for legal purposes.

This presentation focuses on projections of future air quality in the Netherlands, and the likelihood of exceedances of limit values for PM_{10} and NO_2, which are most difficult to attain. In the projections, the effects of current and proposed EU and national generic policies are taken into account. The scenarios include the effects of current and proposed EU source-policies, such as Euro-standards for traffic and application of Best Available Technology in industry. National current legislation

includes subsidies schemes for quicker propagation of cleaner passenger cars and trucks (both new vehicles, as well as retrofitting existing vehicles); further differentiation of car purchase tax, car ownership tax, and motor fuel, depending on their environmental performance; setting of SO_2-ceilings for the electricity and refineries sectors, and subsidies for air scrubbers on stables for livestock in the intensive agriculture. Envisaged national policies include the introduction of a national road-pricing system, an action plan to reduce particulate matter in industry, and tightening of the sectoral SO_2-ceilings.

Because of these policies, yearly average concentrations of PM_{10} and NO_2 in the Netherlands are projected to decrease by about 4 μg/m3 (PM10) and 6-8 μg/m3 (NO_2) in the period between 2005-2020. The number of places where limit values may be exceeded is projected to decrease rapidly, as concentration levels at locations where limit values are presently being exceeded, are often only slightly higher than these limit values.

In the Netherlands, in 2007, the European limit values for annual average NO_2 concentration and for daily average particulate matter (PM_{10}) concentration have been exceeded along motorways and city streets. Uncertain is the length of road along which the exceedance took place; for the NO_2 concentration this is likely (chance >66%) to be about 300 km and for the PM_{10} concentration this is about 75 km. Additionally, the limit values were exceeded in 2007 'about as likely as not' (chance 33 to 66%), along a total road length of around 1000 km for NO_2 and 1600 km for PM_{10}. Concentrations of PM_{10} and NO_2 must be below the limit values everywhere in Europe, ultimately by 2011 and 2015, respectively. Since estimates of future local concentrations have an uncertainty of about 20%, no absolute statements can be made whether concentrations will be below the limit values in time. Model calculations accounting for the effects of current and proposed national and European legislation show strong decreases in likely exceedances of limit values in the Netherlands. Still, limit value exceedances are possible (chance >33%) along road lengths of about 350 km for $PM_{10,}$ by 2011, and about 150 km for $NO_{2,}$ by 2015. These possible exceedances not only depend on the uncertainties and on national and European policies and their effectiveness, but also on contributions by specific additional local measures. The Dutch Government has proposed a plan, including local measures, which aims at meeting the limit values everywhere by 2011 (PM_{10}) and 2015 (NO_2). These local measures, which were not assessed here due to their specific character, could reduce the exceedances. As the effects of local measures and estimates of concentrations are uncertain, continuous monitoring – possibly together with additional measures – will be needed to comply with the limit values.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/18_Koelemeijer_NL_13_EIONET_AQ_080930.pdf

Q and A

Q: Did you account for the higher NO_2/NOx emission ratio? (Jablonska)
A: Yes, for passenger diesel cars, but not for trucks.

Q: What about noise barriers, do you have any study that shows effects on AQ? (Myrtveit)
A: Yes, for NO_2, not for PM. Studies indicate effect, but much uncertainty.

Q: Did you take the harbours into account for the PM10 calculations? (Claeis).
A: We only focused on exceedances along the highways on this study. For harbours and stables we only calculate on 1x1 km resolution, while local authorities do account for these contributions.

GSE-PROMOTE: Urban air quality modelling with AURORA

Koen de Ridder, VITO, Belgium

Abstract

Koen De Ridder, Karen Van de Vel, Jo Vliegen
VITO – Flemish Institute for Technological Research, Mol, Belgium

Frans Fierens
IRCELINE – Belgian Interregional Environmental Agency, Brussels, Belgium

Sef Van den Elshout, Peter Vanbreugel
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URM – City Development Authority of Prague, Czech Republic

"PROtocol MOniToring for the GMES Service Element: Atmosphere" (PROMOTE – see www.gse-promote.org) is a project supported by the European Space Agency (ESA). Its mission is to deliver to the Atmosphere GMES Service Element a sustainable and reliable operational service to support informed decisions on the atmospheric policy issues of stratospheric ozone depletion, surface UV exposure, air quality and climate change.

Within PROMOTE, the Air Quality Service is one of the largest, containing several sub-services dealing with different scales (continental down to local) and themes (e.g., pollen). In our presentation, the focus will be on urban air quality simulations performed with the AURORA model for urban agglomerations in Belgium, the Netherlands, and the Czech Republic. After a brief presentation of the AURORA model, examples of applications will be shown, including air quality forcasts for Belgian cities, and the assessment of urban air quality in Rotterdam and Prague. Particular attention will be given to issues of model uncertainty and validation, to visualisation of simulation results, as well as to the relevance of numerical modelling to European air quality legislation.

Finally, as PROMOTE is nearing its final phase, we will briefly discuss future avenues for consolidating the work that has been done in the PROMOTE project.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/19_DeRidder_GSE_AURORA_13_EIONET_AQ_080930.pdf

Q and A

Q: Can you quantify the benefit of including satellite data, compared to not including it? (Graff)
A: We use surface temperature data and can also get profiles/column values of certain pollutants. We may use them, even if the scales are often not matching. The scale from the satellite data is too rough and it is used as boundary conditions.

Comment: I disagree that monitoring cannot give an answer to source apportionment. (Borowiak)

Q: What is the spatial resolution of Aurora? (Koelemeijer).
A: 1 km² resolution and about 70x70 grid cells. Nesting several programs, depending on application: to EURAD, Chimere,...

Spatial mapping of air quality in Europe: uncertainty and probability mapping

Jan Horalek, ETC/ACC - CHMI

Abstract

Jan Horalek, Peter de Smet, Bruce Denby, Frank De Leeuw

The mapping methodology for creation of European-wide maps for basic pollutants was developed and tested in the last years under ETC/ACC spatial task. The methodology is based on the combination of air quality measured data with dispersion model's output and other supplementary data like altitude, meteorological parameters and population density. The methodology is presently used for regular PM_{10} and ozone map creation.

An important issue is the estimation of uncertainty of such maps. A few approaches for uncertainty estimation are presented, including the uncertainty mapping. Only the interpolation uncertainty is taken into account; the other sources of uncertainty (like measurement errors, representativeness) are not included.

The basic approach for uncertainty estimation is cross-validation, using several statistical indicators (like RMSE) and the scatter plots. In the cross-validation the spatial interpolation for each measurement point using all the available information except from that one point is calculated; the predicted and measured values are then compared and the procedure is repeated for all points. (By this way the uncertainty of the interpolation method at locations without measurements is estimated.)
Another approach is the estimation of the uncertainty map, based on geostatistic theory: Together with the spatial interpolation, the prediction error is evaluated for all the grid cells.

Next to the uncertainty estimates, the maps of the probability of limit value exceedance are developed. These maps take into account the uncertainty of the concentration maps. In these maps the areas with high – middle – low probability of LV exceedance are presented. Such maps are created by the combination of concentration and uncertainty maps.

All the approaches are demonstrated on 2005 European-wide data for health-related PM_{10} and ozone indicators (namely for annual average and 36th highest daily value in the case of PM_{10}, resp. for 26th highest maximum daily 8-hour average and SOMO35 in the case of ozone).

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/20_Horalek_spat_interp_13_EIONET_AQ_0809301.pdf

Shared Environmental Information System (SEIS) - progress report and discussion

Tim Haigh, EEA

Abstract: SEIS NRT AQ pilot 2008 and onwards

The purpose of this document is to outline EEA plans in relation to near real-time Air quality data in 2009 and beyond.

Background

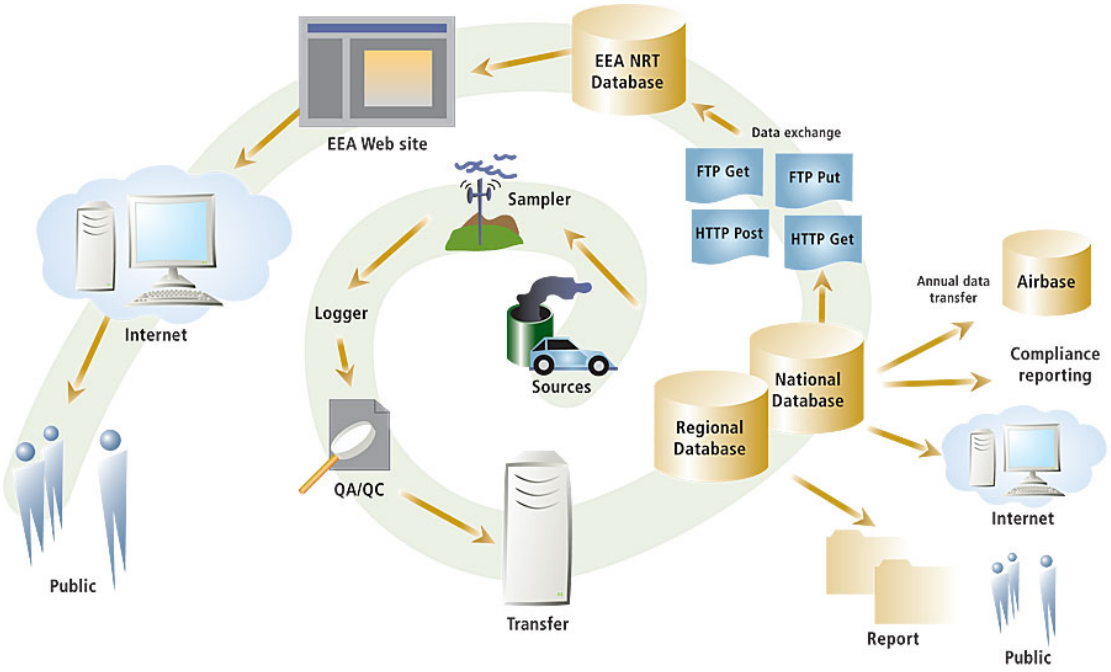
As part of its 2004 – 2008 strategy, the European Environment Agency increased focus on dynamically presenting environmental data in interactive map based Internet sites. One of the foremost projects offers the possibility to track ground level ozone on a pan-European scale and is commonly known as ozone web.

The purpose of the web site, which was launched in 2006, is to inform about ozone in Europe for current and recent situations on an hourly basis based on measured near real-time data. The site provides data providers, air quality experts, as well as citizens the opportunity to follow the development of air quality in a specific region as well as have an overall picture of the situation on a European level.

Keeping the public informed about ozone pollution is a key part of European legislative strategy to address this air pollution. The objective of the site is to provide a visual and easily understandable presentation of measurement data for the public enabling comparison of air quality conditions across borders and providing information about local air quality information sites.

Data from more than 800 air quality measurement stations from 39 data providers in 24 countries are provided to EEA.

In February 2008 the Commission adopted a Communication on establishing a "Shared Environmental Information System" for Europe to improve and streamline the European system for collecting, analysing and reporting environmental information. The ozone web site and data exchange is cited extensively in the communication and is seen as a pilot of Shared Environmental Information System (SEIS) concepts.



A series of SEIS pilot projects have been established. The SEIS pilot project for ozone web focused on three objectives:

- **to demonstrate that the system can be used to provide information relating to provisional ozone exceedances** (current monthly summer ozone exceedance reporting) and provide a basis upon which countries and the Commission can discuss streamlining summer ozone reporting by countries to the European level.
- **to demonstrate that near real-time ozone data can be consolidated to full coverage and repeated for other priority air pollutants, (particulate matter).**
- **to assess the properties of ozone web** to determine which characteristics of the system, data and data exchange mechanisms are key and suitable for extension of this approach to other areas.

Results in 2008

The EEA has been working on these objectives in active partnership with countries. During the course of 2008 a web site which makes use of NRT ozone data to create summer ozone reporting outputs has been piloted. The preliminary results seem good - Summer ozone reporting outputs have been successfully created based on NRT data. Countries have provided feedback, including most importantly confirmation that the results generated from the pilot match their own system outputs.

Consolidation of ozone data provision to full coverage is tantalizingly close with only Bulgaria and Romania outstanding. Over 20 000 ozone date measurement are received and processed per day. Data provision for just a few countries is a little patchy.

EEA has also extended the data exchange system to cater for other air quality parameters. Extension of data coverage to wider air quality parameters has progressed with 16 countries involved in PM10 data provision and over 600 stations providing data. A pilot PM10 viewer has been created and sent for consultation to

stakeholders that expressed interest. Feedback on the pilot PM10 viewer has been positive.

Some countries provide additional air quality parameters such as NO2, SO2, PM2.5, etc to EEA.

Next steps:

- As EEA moves to a new strategy, a key word will be integration. The following areas are seen as the main areas of activity in relation to near real time air quality data:

- Operational integration of the near real time data with summer ozone reporting procedures so that the near real-time data starts to replace the current monthly reporting and becomes part of the EEA official report on the summer ozone season.

- Integration with SEIS: EEA NRT air quality systems provide a real-world example of the kind of services that an open, shared environmental information system will enable, and thus provides proof of concept for the SEIS. This type of approach needs to be generalized a much wider range of environmentally-relevant parameters and information.

- Re-use of near real time data and architecture to support for example GMES services and insitu data; EMEP requirements, creation of forecasts and AQIs.

In 2009, the current systems and procedures for summer ozone reporting will be integrated and aligned with EEA standard approaches to operational air quality reporting. A key dependency is on EU legislation and guidance which should be amended to accommodate the change in approach. The Commission has requested an evaluation of the results of the pilot, to be undertaken in 2009. Full streamlining could occur from 2009 onwards. The summer ozone report is expected to focus on adding value through more sophisticated analysis and timely messaging to compliment the NRT web based interface.

Integration with SEIS: The generalization of the approach for NRT AQ will be further developed in 2009 and integrated into EEA work plans. The NRT data provided to EEA is increasingly expected to focus on securing added value in partnership with others, such as through GMES or other initiatives at a national or international level. It is expected that through EEA's role in insitu coordination that the NRT AQ data will be used for validation and assimilation.

Relevant web-links (until October 2008)
Summer ozone reporting pilot:
SNAPSHOT PAGE - http://86.58.131.6/snapshot/template_viewer.swf
EXPLORER PAGE - http://86.58.131.6/explorer/bin/explorer.html
ADMIN PAGE - http://86.58.131.6/admin/ozoneAdmin.swf

Link to presentation: **http://air-climate.eionet.europa.eu/docs/meetings/080929_13th_eionet_aq_ws/21_Haigh_SEISprogress_13_EIONET_AQ_080930.pdf**

Q and A and Discussion Session 7

Q (Mücke to Koelemeijer): What has happened to PM2.5 in the Dutch assessments? The target value should be reached by 2010. What are the MS action/measures to attain this LV? Is there an assessment at the moment?

A: Measures often respond to both PM10 and PM2.5, although some actions address the coarse fraction. But the policy attention is on PM10, where compliance should have already happened in 2005. If you comply with PM10, you would expect you would also comply with PM2.5 for most places. The reduction of 20% between 2010 and 2020 is the most challenging problem. (Koelemeijer)

Graff: PM2.5 is new, must start to measure.

Mücke: Spain has already started, other early birds? Policy Makers should start earlier to discuss measures. But of course, monitoring is needed.

Graff: Local problems are seen better on PM10 than on PM2.5. Switching to PM2,5 focus more on long range transport of pollution, while PM10 is more a local source problem, with measures on local emissions.

Claeys: Calc LRT effect on PM10 reduction in NL. How much is the effect from the reduced LRT on the NL reductions?

Koelemeijer: Quite a lot, LRT is very important.

Graff: In areas with no information mapping will not bring us further? Do you mean that?

Horalek: Interpolations smooth the info in the areas with no measurements. But this is not enough. In the areas without measurement, we have info by dispersion model or other supplement data, and it seems that it isn't the best situation. In the end there has to be some interpolation of the residuals and it smoothes the interpolation in the areas among the measurements. The information is not as good as we would hope for.

Cryan: where there has been country meetings, are they satisfied?
Poland: was at the meeting. Were encouraged by the meeting …….
SEIS pilots don't seem to be well known by those present.

CONCLUDING REMARKS AND CLOSING DISCUSSION

Anke Lükewille summarised the main topics presented and discussed during the Workshop, listed in this report in the Summary under Concluding remarks.

ANNEX 1. WORKSHOP AGENDA

13th EIONET Workshop on

Air Quality Assessment and Management

Bruges, Belgium, 29th and 30th September, 2008
at Hotel de' Medici

Final AGENDA

Monday 29 September

08:00-09:00	Registration	Catherine Brytygier
09:00-09:15	Welcome address by the host	Marie-Rose Van den Hende, (Vmm, Head of Air Emissions Inventory)
09:15-09:30	Welcome, scope and goal of the workshop	Aphrodite Mourelatou (EEA, Head of Air and Transport Group)
Session 1: EEA Core Set Indicator 005 (chair: Anke Lükewille, EEA)		
09:30-09:50	Critical Loads of nutrient nitrogen(*) and their exceedances – European perspective (*) part of EEA's AQ Core Set Indicator 005 'Exposure of ecosystems to acidification, eutrophication and ozone'	Jean-Paul Hettelingh (CLRTAP/CCE)
09:50-10:00	Discussion session 1	All
Session 2: Air Quality Directives and data flows (chair: Sheila Cryan, EEA)		
10:00-10:30	Update on the new Directive on Ambient Air Quality and Cleaner Air for Europe, status of implementing provisions and the work of the Data Exchange Group	Andrej Kobe (DG ENV)
10:30-11:00	Questionnaire, Air Quality Framework Directive: Lessons learned from the last reporting cycle & improvements/new items concerning the current cycle	Edward Vixeboxse (ETC/ACC; PBL)
11:00 - 11.20	Coffee break	
11:20-11:50	Exchange of Information (EoI): Lessons learned from the last reporting cycle & improvements/new items concerning the current cycle	Wim Mol (ETC/ACC; PBL)
11:50-12:10	Report of the informal EoI working group	Joelle Colosio (NRC, France)
12:10-12:25	Summary of the EIONET Air Quality 'Questionnaire' workshop (June 2008)	Sheila Cryan (EEA)

12:25-12:45	AirBase Survey (user requirements)	Eva Goossens (EEA)
12:45-14:00	Lunch	

Session 3: Air Quality Directives and data flows (continued; chair: Sheila Cryan, Anke Lükewille EEA)		
14:00-14:20	Air pollution by ozone in Europe in summer 2008 - preliminary results	Libor Cernikovsky (ETC/ACC; CHMI)
14:20-15:30	Discussion Session 3	All
Session 4: Country presentations with focus on PM and ozone (chair: Cristina Guerreiro, ETC/ACC)		
15:30-15:50	Trends in air quality in Germany 1995-2007 (PM, NO_2 and ozone)	Arno Graff (NRC, Germany)
15:50-16:10	$PM_{2.5}$ measurement strategy in Austria, and $PM_{2.5}$ levels observed so far	Wolfgang Spangl (ETC/ACC; UBA Vienna)
16:10 - 16.30	Coffee break	
16:30-16:50	Status of PM_{10} measurements and the most important initiatives the Norwegian municipalities apply for meeting the legislative requirements	Hildegunn Jablonska (NRC, Norway)
16:50-17:10	PM measurements, characterization and source apportionment in Spain	Xavier Querol (NRC, Spain)
17:10-17:40	Discussion Session 4	All
19:30-22:00	Dinner	

Tuesday 30 September

Session 5: FAIRMODE, Forum for AIR quality MODelling (chair: Tim Haigh, EEA)		
08:40-08:50	Update: Activities of the Forum for AIR quality MODElling (FAIRMODE)	Anke Lükewille (EEA)
08:50-09:10	FAIRMODE, the air quality modelling guidance document	Bruce Denby (ETC/ACC; NILU)
09:10-09:30	Discussion Session 5	All
Session 6: Long-term trends in ozone concentrations (chair: Anke Lükewille, EEA)		
09:30-09:50	Trends in ground-level ozone concentrations in Europe	Sverre Solberg (ETC/ACC; NILU)

9:50-10:10	Are observed ozone trends in line with emission changes?	Michiel Roemer (TNO)
10:10-10:30	Discussion session 6	All
10:30-10.40	Coffee break	
Session 7: Combination of air quality measurements, modelling and remote sensing (chair: Tim Haigh)		
10:40-11:00	The use of measurements and models in the Netherlands to check compliance with limit values	Robert Koelemeijer (PBL, Netherlands)
11:00-11:20	GSE-PROMOTE: Urban air quality modelling with AURORA	Koen de Ridder (VITO, Belgium)
11:20-11:40	Spatial mapping of air quality in Europe: uncertainty and probability mapping	Jan Horálek (ETC/ACC; CHMI)
11:40-12:00	Discussion session 7	All
12:00-12:30	Shared Environmental Information System (SEIS) - progress report and discussion	Tim Haigh (EEA)
12:30-14:00	Lunch	
14:00-15:00	Concluding remarks followed by discussion	Anke Lükewille (EEA)
15:00-16:30	Walking tour in the historical centre of Bruges	
16:30-17:00	Boat trip on the Bruges waterways	

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