# PROCEEDINGS

# Eleventh EIONET Workshop on Air Quality Management and Assessment La Rochelle 26-27 October 2006

**ETC/ACC Technical paper 2006/4**
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European Topic Centre on Air and Climate Change

The European Topic Centre on Air and Climate Change (ETC/ACC)
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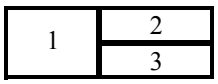
*Front page picture:*




*1. The Saint-Nicolas Tower, constructed in the 14th century, forms together with the Chain Tower on the north bank the impressive entry of the old harbour of La Rochelle.*
*2. Low tide.*
*3. A temporary monitoring station of the ATMO Poitou-Charantes network in La Rochelle, Avenue Jean Monnet.*

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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 11th EIONET workshop was held in La Rochelle in France on 26-27 October, 2006. There were 67 participants from 30 countries and organisations, and 25 presentations were made in 7 sessions.

EEA is taking the lead in providing support for the services as data centre in five thematic areas (air quality, climate change, water, biodiversity and land use). The air data centre focuses on collection, management, quality-assurance and web presentation of air emission and air quality data. There is increasing attention on the sharing of spatial air quality information in Europe, and increasing focus is put on improving the near-real-time exchange of air data, such as provided by the ozone website of the EEA. Presentations at the workshop deal with these and related issues.

Parallel workshop sessions were used during part of the time, to enhance the extent of the program. The parallel sessions were: Technical aspects of data exchange; and Support to air quality assessment by modelling and mapping. We will try to use this also in later workshops, to be able to enhance the number of issues possible to deal with during this 2-day workshop. Especially, issues related to air pollution modelling should be enhanced at the EIONET workshop.

**Session 1** dealt with General aspects of air quality data and data flows.
The new proposed air quality directive was presented, expected to be accepted before the end of 2007. A draft version of the associated data reporting provisions are expected to be available from the Data Exchange Group early 2007. The new WHO Air Quality Guidelines were presented. For PM and SO2, They are considerably lower than the EU Limit Values. The question of quality of PM monitoring data was also discussed, and results of PM monitor equivalence studies and programs were presented from France and the UK.

**Session 2A** dealt with Air Quality data and metadata exchange and AirBase.
The 2004 data reporting cycle is in progress (at the time of the workshop): most Member States have submitted the data in time. It is expected that the update of AirBase will be available on 1 February 2007.

The linking of AirBase stations with European administrative units or regions has prepared the basis for improved applications of AirBase/AirView for assessment purposes (availability of city names in AirBase, population exposure, mapping, etc.). Future developments of the AQ Information systems were presented both on the short-term (planned improvements and extensions of DEM and AirBase in 2007) and on the long-term (development and implementation of the EEA data centre on air). The EEA data centre will cover all data under the AQ Directives as well as under the National Emissions Ceilings Directive, the European Community's obligations as a party to the Convention on Long Range Transboundary Convention and the European PRTR.

**Session 2B** dealt with Discussion on technical issues related to data exchange.
This technical session discussed issues like the data flagging system in DEM/AirBase, DM ISO formats, problems deriving from the rounding of numbers, and needed upgrades of the DEM manual. Member States are requested to send information on their national data flagging system to ETC/ACC (e-mail to Frank de Leeuw).

**Session 3** dealt with Support to air quality assessment by modelling and mapping. The session showed various examples of spatial assessment of air pollutants through modeling methods combined with monitoring and other auxiliary data (population, land use, etc.). The examples were for Europe as a whole, from Switzerland and from Belgium. The examples show that spatial assessment and mapping is used to an increasing degree for policy support. Various institutes and institutions in Europe use more and more advanced models in more advanced applications where monitoring data are used in combination with models.

This development will lead to improved assessment of population exposure to air pollutants in cities and regions in Europe. A prerequisite is that emissions inventories in Europe is prepared with a better spatial resolution.

**Session 4** dealt with Air quality assessment and management as required by the FWD. The status and results of the reporting of air quality in zones and agglomerations is that most MS submitted their reports to EEA (CDR) well before the submission deadline. A preliminary analysis showed frequent and widespread exceedances of the daily and annual PM10 LV and of the annual NO2 (LV+MoT).

The need for zone border defining data, in electronic form to facilitate mapping of air quality in zones in Europe, was emphasised and a proposal given for format and procedure for this. Examples of activities in new MSs to comply with the reporting requirements of the Directives were given from Lithuania and Latvia.

**Session 5** dealt with Exchange of near-real-time information on air quality in Europe. Much of the session dealt with the status and examples of services developed and being developed as a result of the GMES/PROMOTE project activities in the atmosphere field, where air quality assessment and forecasting is one of the 5 themes. The Ozone-web of EEA provides an example of maps of European AQ based upon near-real-time (nrt) data transfer procedures from a lot of European countries to the ozone-web server, a procedure developed by the ETC/ACC with interpolation and visualisation software developed under the EEA, and now in full service. The ozone-web contains state-of-the-art elements regarding the transfer, control, interpolation and visualisation of nrt data on maps. The French PREVAIR system for providing nrt maps of ozone in France and neighbouring areas is another example of functioning systems providing the citizen with on-line AQ data on maps, updated twice daily in the summer season. The activities under the EUMETNET network include to promote the forecasting of air quality in Europe. A COST Action is being set up with the objective "*to setup a forum for benchmarking, harmonising and developing approaches and practices for chemical weather forecasting network and near-real-time information systems in Europe*".

The session showed that the nrt services on air quality is developing, and the combined activities promise improved services in the future for the citizen on nrt and forecasted air quality on maps. This should be of large interest for the EIONET community.

**Session 6** dealt with Update on EEA/ETC-ACC assessment outputs.
The ETC/ACC air pollution assessment activities in 2006 included the Air Pollution report (finalisation, data up to and including 2004), the draft Belgrade assessment report, and the summer ozone reporting. ETC/ACC assessments cover the last decade development of air pollution levels as compared with emissions, policy effectiveness has been studied, and up-to-date summer ozone reporting is carried out.

**The wrap-up discussion** revealed that participants found the programme and presentations very interesting, but that the programme was a bit overloaded as has been the case also earlier years. There are many topics to cover in our EIONET workshops, and 2 full days are needed for these workshops. (This year's workshop was effectively a 1 ½ day workshop).

This year, the modelling topic was covered to a larger extent than in earlier workshops, and the parallel session opened the opportunity to allow for this, and at the same time allow for more in-depth technical discussions related to data reporting, transfer, data base issues.

It is probable that the modelling topic will continue to be covered in the EIONET workshops, and probably increase in extent. To allow for this, the parallel session practice will probably need to be used more.

The question of venue for the next workshop was discussed. Cyprus offered to explore options to host the workshop in 2007. Volunteers for 2007 organising committee was asked for. This will be followed up.

Specific feedback from the Member Countries is asked on two specific technical issues:

- the ETC/ACC requests all users who encounters problems in running AirView to contact the ETC.
- MS are requested to inform the ETC/ACC on their national data quality flagging systems.

# Contents

# INTRODUCTION

The presentations and background documents at the workshop can be found at this link: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/meeting061026.html. The presentations have been summarised in the sections below; please consult the slides in the web link above for details of the presentations.
Discussions, questions and answers are also summarised. (Questions and discussions related to clarifications of specific points in the presentations are not included in this summary).

## Opening of the meeting

## Welcome, scope and goal of the meeting

*Jaroslav Fiala, EEA*

Participants were welcomed to the 11th EIONET Workshop on Air Quality Management and Assessment.

Based on a strategic agreement with the member countries, European parliament, DG Environmet, Eurostat and Joint Research Centre, EEA is taking lead and provides support for the services as a data centre in five thematic areas (air quality, climate change, water, biodiversity and land use). It covers development and streamlining of data flows, establishment and running of QA/QC procedures, development and support of indicators, production of policy-relevant information and communications with a wide variety of audiences.

In the air quality area the EEA activities in 2007 will continue in the development of the air data centre focusing on collection, management, quality-assurance and web presentation of air emission and air quality data. This process has been constantly improved over last years also due to a competent and responsible attempt of member countries to this process.

An increasing attention of the EEA 2007 Work Programme is put on assessment and sharing of spatial air quality information in Europe, population and ecosystem exposure to air pollutants and policy effectiveness evaluation. This will include development and implementation of procedures for quality checking and evaluation of AQ FWD questionnaires. Assessment will be grounded on GIS and AQ mapping, taking into account as much as possible all information on air quality assessment performed by countries.
Increasing attention is paid to improve the near-real time air quality data exchange, the ozone data website (http://www.eea.europa.eu/maps/ozone/map), streamline with summer ozone exceedance reporting, and extend it as a key element of SEIS (Shared Environmental Information System) towards other air quality parameters.

Main EEA activities in air quality area, planed for 2007, are topics on the agenda and will be presented and discussed during the workshop.

Two parallel working sessions are organised during the 11th EIONET AQ Workshop for in depth discussions of selected topics: (technical) aspects of data exchange and support to air quality assessment by modelling and mapping.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/01_eionet11_aq_welcome_JFiala.pps

# SESSION 1
# GENERAL ASPECTS OF AIR QUALITY DATA AND DATA FLOWS

## Session chair: S. Larssen

### *Directive on ambient air quality and cleaner air for Europe and Implementing Provisions*

*Andrej Kobe, DG Environment, European Commission.*

The Clean Air for Europe (CAFE) programme compiled the latest knowledge on the impacts of air pollution, developed and assessed possible future policies. It resulted in the Thematic Strategy on Air Pollution adopted by the Commission in October 2005, and endorsed by the Council and European Parliament in 2006. The Commission has jointly with the Strategy proposed a new Directive for ambient air quality and cleaner air for Europe, which is currently in the co-decision process. It includes elements such as new $PM_{2.5}$ environmental standards and flexibility to address compliance with existing limit values.
The European Parliament adopted its amendments on the Commission proposals in September, and the Council adopted the political agreement on 23rd October. As there are still differences between the institutions, 2nd reading is expected in first half of 2007. In the presentation differences as regards extension times, limit values etc. are presented.

The Directive leaves reporting provisions to be defined through the Implementing Provisions, which is to be adopted by the Committee set-up under the Directive. Provisions are currently developed by the EEA, ETC/ACC and national experts in the Data Exchange Group, which is chaired by DG Environment. It is expected that in the beginning of 2007 final draft of reporting provisions, to be more widely discussed and tested through a pilot project, will be available.

Presentation touches upon related activities such as INSPIRE (on spatial data infrastructure), Shared Environmental Information System and contracts currently ran by the Commission.

At the end, the presentation briefly covers last reporting cycle of 2004/461/EC, with a deadline for submission to the Commission by 30th September 2006.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/02_CAFE_ImplProv_AKobe.pps

## *Global update of WHO Air Quality Guidelines*

*Michal Krzyzanowski, WHO European Centre for Environment and Health, Bonn Office*

Following the recommendations of the WHO "Systematic review of health aspects of air pollution in Europe" WHO launched the project to update its Air Quality Guidelines in 2004. The steering group agreed on the scope and methodology of the update, and identified experts to contribute to the review of the scientific literature. The updated guidelines consist of two parts. Part 1 comprises background materials, which provide a brief yet comprehensive review of the issues affecting the application of the WHO AQG in risk assessment and policy development. Part 2 reviews the health hazards of particulate matter (PM), ozone ($O_3$), nitrogen dioxide ($NO_2$) and sulfur dioxide ($SO_2$), and based on those reviews, formulates health-based guidelines for each pollutant

WHO convened the Working Group on Air Quality Guidelines in Bonn, 18-20 October 2005 to recommend the updated WHO AQG. After editing, the summary of these guidelines was released by WHO (see http://www.who.int/phe/air/aqg2006execsum.pdf )

The updated Guidelines are applicable in all WHO regions. They set guideline values for PM2.5 and PM10, as well as for ozone, nitrogen dioxide and sulfur dioxide. As noted above, the epidemiological evidence indicates that the possibility of adverse health effects remains even if the guideline value is achieved, and for this reason some countries might decide to adopt lower concentrations than the WHO guideline values as their national air quality standards.

In addition to guideline values, interim targets are given for each pollutant**.** These are proposed as incremental steps in a progressive reduction of air pollution and are intended for use in areas where pollution is high. These targets aim to promote a shift from high air pollutant concentrations, which have acute and serious health consequences, to lower air pollutant concentrations. If these targets were to be achieved, one could expect significant reductions in risks for acute and chronic health effects from air pollution. Progress towards the guideline values should, however, be the ultimate objective of air quality management and health risk reduction in all areas.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/03_WHO_AQG_MKrzyzanowski.pps

## *Classification and assessment of representativeness of Air Quality monitoring stations*

*Wolfgang Spangl, UBA, Austria*

Methods for classification and determination of representativeness are presently being developed, which focus on $NO_2$, PM10 and ozone, but shall be applicable to all pollutants.
The classification method for primary pollutants will be based on three types of emissions: local road traffic, domestic heating and industrial sources. The classification criterion is the absolute contribution of these emission sectors to the measured pollution level. For each class, different levels of assessment – from simple surrogate data (traffic census, population density) to emission inventories – are discussed.

The classification of ozone monitoring sites shall be based on NOx emissions from local road traffic (related to local NO titration), regional ozone formation potential and topographic situation/elevation (related to ground level depletion).

The area of representativeness of air quality monitoring stations shall be determined by two criteria: concentration within a certain range, and common reasons of the concentration.
The "concentration" is assessed by statistical parameters related to EC limit or target values: annual mean for $NO_2$ and PM10, annual 90.4 percentile of daily mean values for PM10 (related to 35th highest daily mean value), annual 93.2 percentile of daily maximum 8-hour mean values for ozone (related to the 25th highest value).
The concentration range within the area of representativeness is defined as 10 % of the concentration range observed in Europe, which is about 10 µg/m³ for the $NO_2$ and PM10 annual mean, 16 µg/m³ for the PM10 90.4 percentile and 18 µg/m³ for the ozone 93.2 percentile.
As "common reasons", emissions, dispersion conditions on different spatial scales, and the regional background concentration are taken into account.
"Common emissions" are represented by the classification (3 classes proposed) developed in the project.
Dispersion conditions are considered on a local, regional and large-scale level. Local dispersion conditions are characterised as either nearby facades, street canyon, flat or elevated terrain. The regional dispersion conditions are characterised as either locations in plane, valleys or mountains. The large-scale dispersion situation is related to topographic units (e.g. basins, mountain chains) on a scale of some 100 km.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/04_class_repr_AQmon_stat_WSpangl.pps

This work was carried out under **Service contract to the Commission for the Development of the Methodologies to determine Representativeness and Classification of air quality monitoring stations**
Contractor to DG ENV: Umweltbundesamt Austria; Subcontracts with TNO and Central Institute for Meteorology and Geodynamics, Vienna.)

## *Correction of PM10 measurements, the French approach*

*Olivier Le Bohan & Joelle Colosio, ADEME, France*

France is preparing for developing a system for correction of PM measurement data as measured by automatic monitors. The French monitoring AQ system consists of 37 networks with a total of about 400 automatic stations. The system is funded and operated in collaboration between state, local, industrial and environmental institutions.

The 'default' recommended correction factor of 1.3 is not considered correct in general for France, and results in general overestimate of the PM10 concentrations. France is planning to equip the full networks with state-of-the-art monitors, which have been shown in pilot studies in Paris and Marseille to produce correct PM values (such as TEOM-FDMS and MP101-RST of the Environnement SA).

In the meantime, PM measurements will be corrected through the following system:

- 45 reference stations equipped with TEOM-FDMS or MP101 will be established across the country
- all stations will be linked to one or a set of these ref-stations, based upon proximity

- measured PM values will be corrected by difference rather than by a factor.

This system of PM correction will be implemented by 1 January 2007. The full monitoring network will be updated gradually with the new monitors.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/05_CorrPM10meas_FR_OLeBihan_JColossio.pps

***Discussion***
Historical data on PM10 will be corrected on the basis of the intercomparison results of TEOM and adjusted TEOM measurements in combination with the results of the CHIMERE model. When the corrected historical data will be available is not yet clear.

## *Study of PM correction factors in the UK*

*Janet Dixon, DEFRA, UK*

The UK has undertaken a programme of cross-comparison between candidate $PM_{10}$ and $PM_{2.5}$ sampling methods with the reference method in order to establish comparability. The European Union has produced the Guidance for the Demonstration of Equivalence of Ambient Air Monitoring Methods (EN12341), which sets out whether a candidate method can be considered equivalent to the EU reference method. For particulate monitors 'equivalence' is defined in terms of whether the candidate method is capable of fulfilling the Data Quality Objectives as specified in the First Daughter Directive and strict equivalence criteria are set out and include:

- Between sampler uncertainty($U_{bs}$) for reference samplers of < 2µgm$^{-3}$;
- Between sampler uncertainty ($U_{bs}$) for candidate samplers of < 3µgm$^{-3}$;
- Slope and intercept should not be significantly different from 1 or 0, respectively;
- The expanded uncertainty ($W_{cm}$) at the Limit Value should be less than or equal to the data quality objective (in this case, 25%).

This paper summarises the results of the UK Particulate Monitoring Programme, which has included the operation of seven candidate instruments collocated with the EU reference method (Low Volume Samplers (Kleinfiltergerat) for $PM_{10}$ and $PM_{2.5}$). Instruments included in the programme are: Tapered Element Oscillating Micro-balance (TEOM); TEOM retrofitted with Filter Dynamics Measurement System (FDMS; for both $PM_{10}$ and $PM_{2.5}$); Partisol 2025 Sequential Sampler; OPSIS SM200 (Beta and Mass configurations) and Met-One Beta Attenuation Monitor (BAM).

The results of the investigations show that the current TEOM monitoring method used in the UK fails to meet the criteria for equivalence set out in this study. This result is consistent with previous investigations reported by Defra and the devolved administrations. The UK currently reports TEOM measurements using the inbuilt 3µg offset and 1.03 correction factor with the application of an additional 1.3 correction factor. Analysis of TEOM datasets shows that the use of the 1.3 factor or any other factor in addition to those already contained within the TEOM units does not lead to adherence to the equivalence criteria.
Results for other instruments show that the following meet the equivalence criteria set out in this study without the application of correction for slope and/or intercept: Partisol 2025 Sequential Sampler; TEOM retrofitted with FDMS (for $PM_{10}$ and

$PM_{2.5}$); and the OPSIS SM200 (by Beta). The following instruments meet the equivalence criteria set down in this study only after application of correction factors for slope and/or intercept: OPSIS SM200 (by Mass) and Met One BAM. The operation of candidate instruments in configurations different from those employed in this study may constitute a different method, and it cannot be assumed that the conclusions are transferable.
Experience gained in undertaking the current programme highlights a number of issues related to the Guidance on Equivalence, which will be raised with the Commission and include topics such as related to significant outliers, criteria for acceptance of a dataset.
The equivalence study raises a number of interesting policy issues for the UK and other member states. For instance:
- It is not considered that this information invalidates all the TEOM measurements in the UK national network. TEOMs will continue to be useful to local authorities for use in the review and assessment process. We also remain committed to providing near real-time data to the public and only automatic monitors can do that.
- Defra and the devolved administrations will upgrade the national network to achieve compliance for the first Daughter Directive.
- They will also take the findings into account when they embark on the major task of greatly increasing our $PM_{2.5}$ network for both the new EU Directive and the UK Air Quality Strategy.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/06_PM_CorrFactors_UK_JDixon.pps

Link to report:
http://www.airquality.co.uk/archive/reports/cat05/0606130952_UKPMEquivalence.pdf

## General discussion.

The general discussion focussed on practical aspects of the correction methods. In the French method the correction (that is the difference between the results of the TEOM-FDMS and TEOM-50° instruments) is added every 15 minutes Flow rates are checked every two weeks. As there is not one constant correction factor, in the Framework Questionnaire it will be stated that concentrations have been corrected by a variable factor.
There was some concern on the implications of a possible revision of the station classification scheme. For large networks re-classification may lead to a substantial workload.

## Summary of session 1

The session had presentations regarding the new AQ Directive, the new WHO guidelines as well as examples of PM method equivalence studies.

The new proposed Air Quality Directive is in process through the Commission levels, and a 2nd reading is expected to take place during the 1st half of 2007. The new directive will have environmental standards for PM2.5 and more flexibility for MSs to address non-compliance. Reporting provisions for the new directive are being developed within the Data exchange group (DEG), a draft being expected early 2007. There are linkages between this data reporting flow and other reporting initiatives like INSPIRE, SEIS and other.

New Air Quality Directives (AQG) have been established recently by WHO, for PM2.5, PM10, ozone, NO2 and SO2. These have now global acceptance. As a help for countries and regions with very high pollution levels, interim targets have been set in order that the AQGs can be reached in a step-wise manner.

In a Service contract to the Commission, UBA Wien develops methods for classification and determination of representativeness of monitoring stations. They deal with indicators like emissions and resulting contributions from source sectors to the AQ at the station locations, and assessment of area of representativeness based upon the concentration level itself (the area with concentration within +- 10% of the level at the station), or defined by surrogate parameters such as emissions, local dispersion, regional background level etc.

France and the UK presented PM measuring equivalence studies. In France, where 400 PM monitoring stations are at work, the TEOM-FDMS and a BAM monitor have been shown to perform well (recent campaigns in Paris and Marseille). Stations will be gradually equipped with these instruments, and in the meantime PM10 results will be corrected, on the basis of comparison studies at about 45 'reference' stations across France. This study is estimated to cost some 300 keuros.
The UK study concluded that the regular TEOM failed to comply with the CEN standard, while 6 other types complied, with or without the use of a sampler specific correction factor. The study raised a number of methods and policy related issues (see the abstract above and the presentation).

# SESSION 2A
# AIR QUALITY DATA AND METADATA EXCHANGE AND AIRBASE

## Session chair: S. Larssen

### *The 2004 data reporting cycle*
*Patrick van Hooydonk, MNP, NL (ETC/ACC)*

Three weeks after the submission deadline ( 1 October) of the EoI 2006 reporting cycle 90 percent of the country reports have been delivered. 33 countries have delivered their air quality information; data from 4 other countries is to be expected. Until today 23 member states have received a country feedback and one member state already has given a reply.
Due to the good response of the EoI 2005 country feedbacks the number of stations with missing essential meta information has decreased considerable and many reported outliers resulted in resubmissions and additional rejection of measurement results.
In addition to the reports on missing essential information and on outliers, the EoI 2006 country feedbacks contains a new overview, called 'missing data'. In this overview time series defined as operational are shown for which 2004-data are stored in AirBase but no data has been reported for 2005. With this report we hope to avoid unintended gaps in time series.
The end of the reporting cycle is planned for 1st February 2007.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/07_EoI2005_reportcycle_PvanHooydonk.pps

***Discussion***
Q.: In the feedback reports questions on current (2005) and historical data is combined. I prefer to do the updating of historical information in the first half of the year when reporting stress is much lower.
A:. ETC/ACC will send the feedback reports on historical data in spring 2007.

## *Linking AirBase with geo-info; future developments of the Air Quality information system*

*Wim Mol, MNP, NL (ETC/ACC)*

The EurBoundaryMap (Sabe) database has been used in order to link the AirBase stations with European administrative units or regions. The Sabe regions are described as polygons and have a code and a name. Information on the Sabe database can be found on www.eurographics.org. A search process has been implemented in order to determine which AirBase station is located in which Sabe region. Some stations couldn't be matched because the stations are located in countries for which Sabe information is not available (Bosnia and Herzegovina, Serbia and Montenegro and the Former Yugoslav Republic of Macedonia) or because the stations coordinates are missing, wrong or inaccurate. More matches could be found by matching of Sabe names with station or city names.
Furthermore, the Sabe codes have been matched with the national NUTS/LAU codes. The NUTS/LAU codes are available on
http://ec.europa.eu/comm/eurostat/ramon/nuts/lau_en.html
The result of the matching actions is that 5408 from the 5585 stations in AirBase are matched with Sabe and NUTS/LAU codes. The matching lists will be enclosed in the EoI2006 country feedback for checking by the data suppliers. The data suppliers will also be asked to correct wrong station coordinates so that it will be possible to match all stations with the administrative units.
Linking the AirBase stations with administrative units has several advantages:

- More city names are available in AirBase because they are known on LAU1 or LAU2 level
- By making GIS overlays with population or land cover maps the AirBase stations can directly be linked with population or land cover information
- The matching information can be combined with the maps of zones and agglomerations (see presentation: European mapping of air quality in zones and agglomerations).

Possible future developments of AirBase are:

- Adapt AirBase to make it possible to upload the Sabe codes/names and the zone and agglomeration codes
- Upload AirBase with the updated Sabe, NUTS/LAU and zone agglomeration information
- Upload AirBase with the GIS overlay results (population numbers, city names etc.)
- Integrated control of EoI and the AQ questionnaires. The DEM contains the necessary meta information for the AQ questionnaire. After importing the raw data, statistics and exceedances can be calculated in the DEM. The export

function of the DEM will be extended with AQ questionnaire spreadsheet, so that it will be possible to generate a filled-in questionnaire.
- From AirView it is possible to create a GIS map in the EEA Map Service. Analogously it is possible to generate a *.kml file to visualize the AirBase stations in Google Earth. Applications are: station coordinates checking, insight into station surroundings, visualization of statistics and exceedances.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/08_AirBase_Link_geo-info_Future_dev_WMol.pps

### *Future developments: Air Quality in the shared Environmental Information System (SEIS), dissemination of air quality information.*

*Sheila Cryan, EEA*

The presentation provides a brief description of the Shared Environmental Information System (SEIS) and the processes which are already underway to make it a reality. EEA has responsibility for the data centre on air within the SEIS. This data centre must provide the quality assured data at European level for air quality and emissions of air pollutants. EEA will design and implement the data centre on air through its work programme in 2007 and 2008.

In 2006, preparatory work has begun to improve the dissemination of the air quality data held in Airbase. Draft applications for downloading and interactive queries on tabular data are available in EEA Data Service for users to try out and comment. A new function is the provision of files that can be used in Google Earth.

It is important to appreciate that the data centre on air is wider than the data provided under the Exchange of Information Decision. It will cover all data and information under the Air Quality Framework Directive and its daughter directives, the National Emissions Ceilings Directive, the European Community's obligations as a party to the Convention on Long Range Transboundary Convention and the European PRTR.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/09_AQ_in_SEIS_SCryan.pps

## General discussion

In the discussion comments on and suggestions for improvement of the dissemination tools of the EoI information were made. The representative from Germany remarked that he had some problems with using AirView. By implementing the EEA data centre on air during 2007-2008 the dissemination of the information will be further improved. For the time being, the ETC/ACC requests all users who encounters problems in running AirView to contact the ETC. It was stressed that next to AirView other tools are available (XML-dumps including Excel-macros for extraction of statistical information, maps showing exceedance information). Various participants supported the suggestion to include additional information like population data, city names in AirBase. This will facilitate the AQ assessments.

### Summary of session 2A

The 2004 data reporting cycle is in progress (at the time of the workshop): most Member States have submitted the data in time. Due to the high quality of the delivered information and due to further streamlining of the data processing by ETC/ACC it is expected that the update of AirBase will be available on 1 February 2007.
AirBase stations have been linked with European administrative units or regions. This has prepared the basis for improved applications of AirBase/AirView for assessment purposes (availability of city names in AirBase, population exposure, mapping, etc.). Future developments of the AQ Information systems were presented both on the short-term (planned improvements and extensions of DEM and AirBase in 2007) and on the long-term (development and implementation of the EEA data centre on air). The EEA data centre will cover all data under the AQ Directives as well as under the National Emissions Ceilings Directive, the European Community's obligations as a party to the Convention on Long Range Transboundary Convention and the European PRTR.

# SESSION 2B
# DISCUSSION ON TECHNICAL ISSUES RELATED TO DATA EXCHANGE

### Session chair: F. de Leeuw

This session started with a short introduction by Frank de Leeuw on a proposal to introduce quality flags in the data submission. In a rudimentary way quality flags are already included in AirBase: valid/invalid data is flagged with 1/0. An extension of this system is proposed in order to identify when data is missing due to calibration or normal maintenance (following the data quality objective in the directives). With an increasing number of measurement data on heavy metals and POP it will become important to label data which are below the detection limits. During the discussion it became clear that most MS have in some way a flagging system operational. Belgium was opposing any flagging system; they foresee an increase in workload as this information is not available at the central level. Other MS agree on flagging but stressed the need to harmonize the system across Member States. MS are requested to inform the ETC/ACC on their national quality flagging systems **(please send an e-mail to Frank de Leeuw).**

In calculating statistics and exceedances a lot of problems derive from rounding numbers. This should be dealt with/harmonised in the implementing provisions.and further discussed in the Data Exchange Group.

Various technical issues were discussed:

- Belgium reported problem with using the ISO 7168-1985 format as input to DEM. As this format has limitations. MS are adviced to use the ISO 7168-1998 format.
- The Netherlands appreciated the new DEM version 9. The option for multiple year uploads was found very useful. However, from the manual it is not always clear which new features are available. When preparing the next manual of DEM v10 the ETC/ACC will improve this.
- The UK prefers the use of chemical names in stead of the chemical formula in the feedback report.

- Minor problems in the use of the export file when changing meta information was reported. In the next DEM v10 the ETC/ACC will improve this.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/10_AirBase_prop_qual_flags_FdeLeeuw.pps

Link to background paper: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/10a_flagging_in_AirBase_bckgr_FdeLeeuw.doc

# SESSION 3
# SUPPORT TO AIR QUALITY ASSESSMENT BY MODELLING AND MAPPING

## Session chair: S. Larssen

### *European scale AQ mapping and evaluation of its uncertainty*

*Jan Horalek, CHMI, Czech Republic (ETC/ACC)*

In the presentation the activities of the task "Spatial air quality data" under ETC/ACC's Implementation plan were presented.

The main final outputs of were shown in the first part of the presentation, namely the developed mapping methodology and the created maps of $PM_{10}$ (annual average and maximum 36th daily value) and ozone (SOMO35) for 2003. The method for map creation is as follows: Rural and urban air quality are mapped separately, due to different character of urban and rural air quality both for PM10 and for ozone. Rural maps are created using a linear regression model of measured air quality data with modelled data from the EMEP dispersion model, altitude and sunshine duration and by spatial interpolation on the residuals of this regression model using ordinary kriging. Urban maps are constructed by addition of rural background map into interpolation of urban increment (so-called "Delta", i.e. the differences between the urban and the rural background air pollution). Rural and urban maps are merged together with the help of population density map. (In areas with a low population density, the rural map is applied, in areas with a high population density the urban map is used, and in the mid-areas the combination of both maps).

Then this year's activities of this task were presented. Actual maps for 2004 are constructed, for more components and their parameters then the year before (e.g. 26th highest 8-hour maximum daily value for ozone, AOT40 for forests or annual average of $NO_x$ for rural areas). The creation of the $NO_x$ rural map was discussed in more detail.

At the basis of AOT40 maps (both for crops and forests) the maps of the areas at risk/damage are constructed, separately for different land cover classes (e.g. arable land, pastures, broad-leaves forest, coniferous forests).

The other this year's activity is further development of the mapping methodology, namely by the use of actual meteorological data instead of climatic. This brings the improvements of the results.

Moreover, more detailed uncertainty analysis is executed for different interpolation methods, especially the analysis bases on the crossvalidation.

The first activities at the field of the spatial mapping of uncertainty were presented. Such uncertainty mapping is possible for geostatistical methods only. It has – contrary to crossvalidation analysis – some uncertainty in itself.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/11_Europ_spat_interp_AQ_mapping_JHoralek.pps

## *Modelling the spatial distribution of particulate matter in Switzerland*

*Rudolf Weber, Swiss Federal Office for the Environment (BAFU)*

Exposure to particulate matter poses one of the greatest environmental health problems in Switzerland. The national air quality standards are regularly exceeded at many different sites. Therefore, the concentrations of particulate matter must be lowered by emission reduction measures. To assess the population exposure under present conditions and under various emission scenarios, models based on emission inventories are useful tools.

In a recent study, dispersion modelling for PM10 and PM2.5 throughout Switzerland was presented ("Modelling of PM10 and PM2.5 ambient concentrations in Sitzerland", Report: UM-169, Bundesamt für Umwelt, 2003). Concentration maps for PM10 and PM2.5 and population exposure were computed for the year 2000, and for two scenarios in the year 2010.

First, emissions of primary particles were modelled. Separate emission inventories were drawn up for each source group (road transport, industry, households etc.) at a spatial resolution of 200 m. Each PM10 emission inventory was split into a fine fraction (PM2.5) and a coarse fraction (PM10-PM2.5) using specific PM2.5/PM10 ratios. Dispersion was then modelled by applying transfer functions to the emission inventories. These functions were computed based on a Gaussian plume model, using hourly meteorological data for the year 1998. Different functions reflect source group characteristics (emission height, deposition velocity) and dispersion characteristics (e.g. in alpine valleys, the transfer functions are aligned with the direction of the prevailing wind).

Secondary particles like nitrate and sulphate aerosols were modelled by transforming the ambient concentrations of their gaseous precursors ($NO_2$, $SO_2$). Ammonium is calculated assuming complete neutralization of nitrate and sulphate ions. Secondary organic particulate matter was modelled using VOC emission inventories, yield factors and dispersion modelling. Finally, the imported background concentration was parameterized.

The main results are the annually averaged PM10 and PM2.5 concentration maps at 400 m grid resolution. Population exposure was also computed: in 2000, 41.3% of the population was exposed to PM10 concentrations above the air quality standard. For the "maximum feasible reduction" scenario, this number drops to 4.9% of the population.

If not the spatial distribution of PM10 is needed but only the mean population exposure a method based on measured data was presented. The measured data from stations located in different settings are used. The stations are weighted according to

the population they represent. This gives a population mean of PM10-exposure in good agreement with the dispersion model and allows to determine the long-term evolution of population exposure.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/12_spat_distr_modelling_PM_CH_RWeber.pps

### *Urban scale air quality modelling with AURORA – a review of results from recent projects*

*Karen Van de Vel, Koen De Ridder, Filip Lefebre, Clemens Mensink, Jo Vliegen*
VITO, Flemish Institute for Technological Research

Urban air pollution is one of the most stringent environmental problems in Europe today. Urban to regional scale air quality modelling systems (AQMS) are considered as the appropriate tools for the evaluation and prediction of air pollution. The AQMS AURORA was developed at VITO, it has a numerical grid structure and contains sub-models that treat meteorological processes, tropospheric chemistry, and transport of pollutants.
We will present recent results of the BUGS project (http://www.vito.be/bugs/), where we applied the AURORA model in order to investigate the influence of changing emissions, greening of cities, urban sprawl etc. on the air quality.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/13_urban_AQ_modling_AURORA_KvandeVel.pps

### *Land use patterns and spatial interpolation of air pollution measurements*

*Stijn Janssen(1), Clemens Mensink(1), Frans Fierens(2) and Gerwin Dumont(2)*
*(1) Flemish Institute for Technological Research (VITO); (2) Belgian Interregional Environment Agency (IRCEL)*

Air pollution has become a major concern in highly urbanized regions such as Belgium. In order to assess ambient air quality, a dense network of monitoring sites has been developed. The real-time measurements of the telemetric network are used to inform the public, to trigger a warning mechanism in case of threshold exceedance and to feed short term forecast models. The average distance between nearest measuring stations is about 25 km in Belgium. In spite of this dense coverage it remains non-trivial to make an accurate spatial map from interpolations of these point values. Rather than presenting a table of punctual measurement values, a spatial map is more informative to the general public. Ambient air pollution concentrations such as ozone, NO2 and PM10 are governed by two different mechanism, each acting on a different spatial scale. On the regional level, fluctuations in the concentration pattern are mainly meteorological from origin. Beside this, ambient air pollution can have a distinct local character due to local emission sources. In an urbanized region such as Belgium, the latter effects are significant. We describe an interpolation model, called RIO, that is developed to incorporate both the regional and local scale of the air pollution phenomenon and that produces concentration estimates on a high resolution grid.

The spatial interpolation is based on ordinary Kriging. Before Kriging is applied, the local character of each sampling value is removed in a so-called “detrending” procedure. For this detrending we rely on quantified relations (trend functions)

between land use patterns and air pollution characteristics. For each of the pollutants a land use indicator is defined based on CORINE land cover maps. The indicator is applied to assess a trend function between air pollution characteristics and land use. By removing the trends in the expectation value and the variance of the sampling values, all stations are transformed into artificial siteindependent sampling sites, suited for application of the Kriging scheme. After the Kriging interpolation step, each grid value is retransformed using the appropriate trend shifts, corresponding to the land use of the interpolation location.

The results of RIO are validated by the application of the "leaving-out-one" technique. The model is used to calculate air pollution at a particular monitoring site, taken into account all available values except the measurement at that location. This latter value is compared to the interpolation result and can be used to evaluate the model.

Maps from RIO provide a much more realistic picture of the actual air quality levels, compared to a standard interpolation technique. In particular for pollutants such as NO2 and PM10 for which only a limited number of background stations are available. The model is applicable for the production of historical, real-time or forecast maps. It can also be applied for the construction of annual averaged air pollution concentration maps. An example of such a map is given in Figure 1. Annual averaged NO2 concentrations are presented, obtained by a standard interpolation technique (IDW) and by the RIO model.

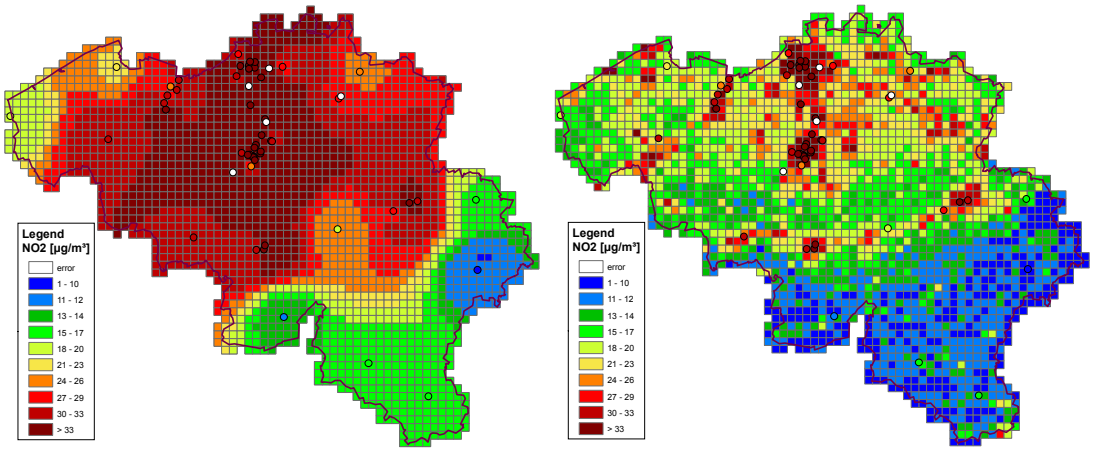



**Figure 1: Year average NO2 concentrations for 2002 produced by a standard interpolation technique (left) and by RIO (right).**

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/14_landuse_spat_interp_AQ_RIO_SJanssen.pps

## General discussion

The session chairman stated that the presentations in this session shows that spatial assessment and mapping is used to an increasing degree for policy support. Various institutes and institutions in Europe use more and more advanced models in more advanced applications where monitoring data are used in combination with models. Monitoring data are used both as a basis for interpolation/kriging as well as for validation. Auxiliary data like population distribution and land use data are used actively for improving the spatial assessment. Potentially this development will lead to improved assessment of population exposure to air pollutants in cities and regions in Europe.

Andre Kobe of DGEnv called for centers of expertise to be instigated in various places in Europe who could contribute, through own activities and through knowledge transfer, to this improved assessment of spatial air pollution distribution and population exposure across Europe. He mentioned JRC and their initiative towards improving spatial assessments through modeling.

Wolfgang Spangl, Austria called for better resolution of emissions data, and that such improved spatial resolution should be consistent across Europe. Better emissions data is an important prerequisite for improved assessment through modeling. It was mentioned that France had (or is developing) an emissions resolution of 1x1 km2.

Session chairman mentioned that each of the MS has their modeling expertise who could benefit from collaborating with centers of expertise so that European-wide spatial assessments with high resolution can be developed. To that end, modeling workshops within the EIONET community should be held.

### Summary of session 3

The session showed various examples of spatial assessment of air pollutants through modeling methods combined with monitoring and other auxiliary data (population, land use, etc.). The examples were for Europe as a whole (Jan Horalek and ETC/ACC), from Switzerland (National spatial assessment, Rudolf Weber) and from Belgium (urban AQMS examples, Karen van de Vel et al., and for Belgium, Stijn Janssen et al.). The examples show that spatial assessment and mapping is used to an increasing degree for policy support. Various institutes and institutions in Europe use more and more advanced models in more advanced applications where monitoring data are used in combination with models.

Some concluding remarks:

- This development will lead to improved assessment of population exposure to air pollutants in cities and regions in Europe.
- A prerequisite is that emissions inventories in Europe is prepared with a better spatial resolution
- Workshops on spatial assessment through modeling and monitoring should be carried out within the EIONET community, with the involvement of JRC.

## SESSION 4
## AIR QUALITY ASSESSMENT AND MANAGEMENT AS REQUIRED BY THE FWD

### Session chair: J. Fiala

## *MSs' reporting under the Directives: status and results*

*Frank de Leeuw, MNP, NL (ETC/ACC)*

There was no presentation on this topic. Frank de Leeuw made the following statements:
Reporting under the AQ Framework directive is covered by the decision 2004/461/EC, more commonly known as the "FWD-Questionnaire". The deadline for submission to the Commission is 30 September. By 15 October 2006 reports had been received by the ETC/ACC from 22 MS. Italy, Ireland and the Netherlands are still missing. For a full analyses of the reports additional information submitted under the EoI is needed and can start therefore only when AirBase has been updated in the beginning of 2007. The CDR has been used by most of the MS. Evaluating the Questionnaire is hampered by the many "small" in consistencies or mistakes (e.g. inserted blanks/spaces, columns or rows; use of undefined symbols).

A first analyses of the number of zones where the LV are exceeded showed that the PM10 daily LV is exceeded in all reporting countries. Exceedances of the daily PM10 LV is reported in 39% of all the zones, the annual PM10 LV is exceeded in 17% of the zones. 15 countries report an exceedance in all urban agglomerations. For NO2 exceedances of the LV+MoT is found in 14% of the zones.

## *European mapping of air quality in zones and agglomerations*

*Sheila Cryan, EEA*

The presentation reviews the current situation for national reporting on zones and agglomerations under the questionnaire for annual reporting on ambient air quality assessment and management (2004/461/EC). The difficulties encountered in producing a European spatial dataset of zones and agglomeration are noted. Methodologies for collecting boundary data from countries are proposed.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/16_AQ_Zones_proposal_SCryan.pps

## *EU project Development of Estonian Air Quality Management System- actions and outcomes.*

*Tarmo Pauklin, Estonia Environmentral Research Centre*

According to the Air Quality Framework Directive 96/62/EC, all EU Member States, which do not have representative measurements of the levels of pollutants for all zones and agglomerations shall undertake series of representative measurements, surveys or assessments in order to have the data available for implementation of the Directive.

As a background several Phare projects have been accomplished in Estonia
- EL Phare Air Accession Twinning Project ES98/ IB-EN-018a, Air Quality management: issues for EU accession
- EL Phare Air Accession Project ES 9805.02, Supply of Air Monitoring Equipment (Investment)
- Development of **Estonian Air Quality Management System** was one of the main recommendation made by the Twinning project.

**Progress of the project**
Tender for the AQMS development project was prepared by the end of 2002. Two offers were received, and the contract was signed with SMHI in February 2005. Duration of the project was one year, total budget 3.5 M€.

**Components of the Project**
***- Air Quality Modelling software***
AirViro: One corner stone is that only ONE software application installation is needed (in the Central Office); users at the Central Offices access via the Local Area Network (LAN); county Offices access via the Internet utilising a standard PC with Office Package and an Internet connection. No additional application/software installations are needed at the County Offices.
Different Air Quality Models were installed (Langrangean / Gaussian model, Grid model, MATCH model, Heavy gas model, Street canyon model, Receptor model, Wind model).
The first nationwide emission data base was compiled.
***- Upgrading Ambient Air Quality Monitoring Stations***
Existing monitoring stations were upgraded. Analyzers were replaced and new components added, meteorological masts added to background stations
***- Meteorological Measurement Equipment***
Three 24 meter masts will provide input to large scale modelling.
***- Passives Sampler Campaigns***
4 nationwide campaigns, 145 samplers per campaign ($SO_2$, $NO_2$, VOC).
***- Laboratory Equipment***
Chromato-mass detector for organic pollution determination; high performance liquid chromatograph (HPLC) and UV detector (ketones + aldehydes); Heavy metal detection equipment ICP (air + precipitation).
***- Computers***
Workstations – air quality experts at Environmental Inspectorate and County Environmental Departments were equipped with workstations and laptops to use the system
Two identical IBM server systems – in the Estonian Environmental Research Centre (EERC) and the Environmental Information Centre,, mirrored with each other Server system, workstations and IAirViro software with extensive training and development (creation of emission databases, meteorological databases etc)
***- Training***

**Main Partners**
- Estonian Environmental Research Centre (EERC) via the formal Beneficiary The Ministry of Environment. Other partners from Estonian side were: Environmental Information Centre, Estonian Meteorological and Hydrological Institute, Environmental Inspectorate, County Environmental Departments, City / Municipality Environmental Departments with Tallinn City as the leading agency
- SMHI, Sweden. Several other partners from Sweden, Germany and Poland took part from the project

**Some Problems occurred and were overcome**
- Many organizations involved
- Staff competence and training is essential. Most important partner is county environmental department (inserting and checking new emission data), without adequate emission data activities of the other partners are irrelevant
- Service & Maintenance of computers, monitoring equipment, etc;
- Competent System Manager was needed;

- Maintenance of Emission Database. Quality of the output of the system depends on quality of the input data – main source of the errors is air emission database
- Long-term financing of the maintenance of the system and accompanying obligations, enacting exact obligations of the parties

**Due to the successful project Estonia is able to fulfill obligations on different level:**
- Coordination of the ambient air quality monitoring in the zones and agglomerations
- Planning of the air quality measurement campaigns in problematic areas and consultation
- Composing and distributing printed matter about the importance of the air quality
- Verifying air emission databases using combination of the modelling and monitoring
- Measurement and comparison of the levels of the 13 priority pollutants with limit values
- Development and implementation of the new analysis and sampling methods for ambient air pollutants
- The first nationwide emission data base is developed (3500 point sources, 2900 road links)
- New type of sources (households, traffic, trains, planes)
- Drafting action plans for Tallinn agglomeration and Ida-Virumaa zone
- inform public about air quality and pollution episodes (http://mail.klab.ee/seire/airviro)

The presentation shows the scheme of National AQMS.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/17_dev_Estonia_AQmonsyst_TPauklin.pps

## *Future development scenarios for traffic system and air pollution in Riga city*

*Iveta Steinberga,* Latvian Environment, Geology and Meteorology agency

The Air quality improvement plan in Riga is being implemented based on the information on exceedances and the potential risk of the pollutants as mentioned in the AQ directives and daughter directives. Unlike European long-term programs and action plans, the Riga City's program includes short-term actions till 2009. The program has been elaborated in 3 steps: assessment of the existing situation; selection of instruments and arrangements for air quality improvement and setting up a scheduled air quality improvement plan.

Depending on the targets, the air quality monitoring in Riga is being performed at different stations: three stations perform monitoring at national level; three municipal stations and two stations for specific air quality control in Riga Sea Port. The main tasks of the air quality monitoring for the period till 2009 are to lower the air pollution level to the level for human health protection and to implement preventive measures for places of satisfactory air quality but of potential danger in the future. For implementing the targets priorities were defined, mainly based on a cost effectiveness analysis, forecast of air quality changes (based on temporal dynamics of emission sources). Additionally, different scenarios were analyzed, social and economical development, potential changes in legislation and inhabitant areas. For the assessment of the program effectively, a system of assessment and control was included.

The results of an air quality analysis, based on monitoring data and modelling, shows that different actions are necessary for nitrogen oxides, benzene and particulates ($PM_{10}$) to improve the air quality in Riga.

Additional modelling exercises were performed for different transport development scenarios. About 10 different scenarios were evaluated – from "do nothing" to build 2 additional bridges and tunnel for Daugava river crossing.

Effectiveness of air quality improving program in Riga we will see only in closest future. The evaluation and upgrading of this program will be a subject for study prosecution.

Links to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/18_dev_scen_traffic_AQ_Riga_Steinberga.pps

### Summary of session 4

Member States are required to report annually the Air Quality in their zones and agglomerations. Most MS submitted their reports to CDR well before the submission deadline. A preliminary analysis showed frequent and widespread exceedances of the daily and annual PM10 LV and of the annual NO2 (LV+MoT).

In order that spatial assessments and maps of air quality in Europe can be presented, there is a need to collect data on zone borders in a consistent manner. It is actually necessary to deliver zone border information in electronic form according to a decided format. The problems related to this was presented by Sheila Cryan of EEA. A proposal on how to do this was presented.

Examples of activities in new Member States to comply with assessment and reporting requirements were presented by representatives from Estonia and Latvia (Riga). Estonia has established a National AQMS system which includes components like modeling and AQM software and hardware, upgrading of monitoring stations, meteorological measurements, emissions inventory and its maintenance, lab upgrading, and training. With the stablished system, they are able to meet the Directives' requirements.
Riga is establishing an Air Quality Improvement Plan according to the Directives' requirements. Scenarios have been developed (e.g. linked to traffic planning in the city) and analysed according to cost effectiveness. Specific scenarios have been developed for PM, NO2 and benzene, with a target date of 2009.

## SESSION 5
## EXCHANGE OF UP-TO-DATE INFORMATION ON AIR QUALITY IN EUROPE

### Session chair: F. de Leeuw

### *On the air pollution situation in the La Rochelle region*
*Edwige Revelat,* ATMO Poitou-Charentes

**The French air quality monitoring network**

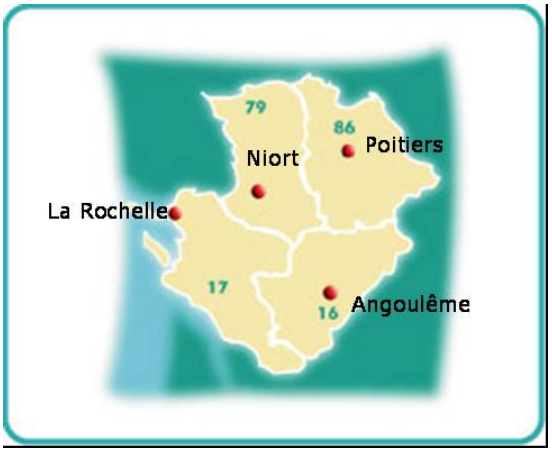
The French ministry of ecology and sustainable development is responsible for the national program of air quality assessment and management.
French law date 30 December 1996 stipulates that air quality monitoring must be done by local associations called AASQA (Associations Agréées de Surveillance de la Qualité de l'Air, "approved air quality monitoring associations").

Three national laboratories provides them with the necessary scientific knowledge and ADEME is the technical co-ordinator and manage the national air-quality data base.

**« AASQA », what does it mean ?**
The associations that have to monitor air quality are non-profit associations under the French Law of 1901. They are formed around 4 groups of stakeholders involved in atmospheric pollution issues :

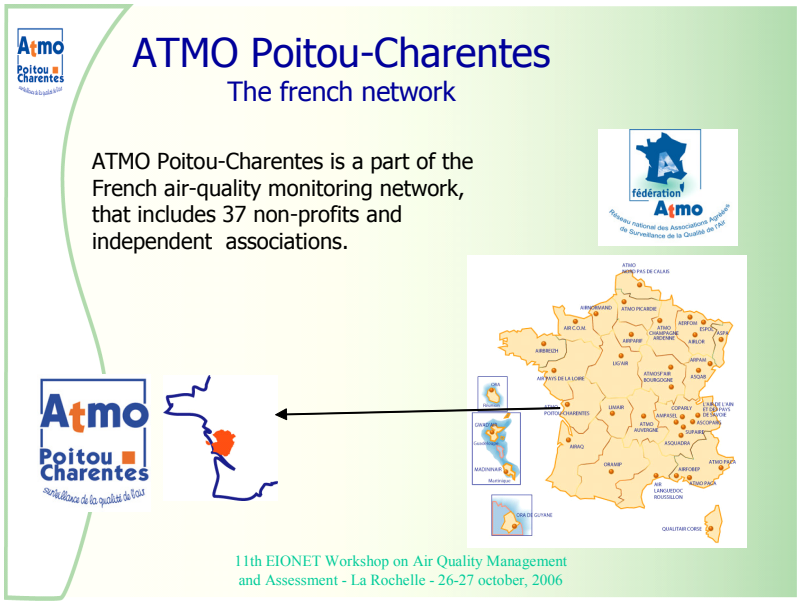
- The representatives of the government (prefect, departmental health administration, transport administration,..) local or regional representativesIndustrials (they pay a tax because of their atmospheric emissions)Other members like consumer and environment associations, university, research laboratories, health professionals...)

The AASQA have been approved by the french ministry of ecology for air-quality monitoring. Air quality monitoring in France is managed by 24 AASQA , among them ATMO Poitou-Charantes.




**ATMO Poitou-Charentes**
ATMO Poitou-Charentes is a part of the French air-quality monitoring network covering the departments of Charante, Charante-Maritine, Vienne and Deux-Sèvres, The Association has in total 67 member, including 37 non-profits and independent associations. A team of 14 people works on these topics in ATMO Poitou-Charentes to fulfil the network's objectives; the annual budget is about 1 million euros.. The association monitors air quality in the western part of France in a region called Poitou-Charentes. It is based in La Rochelle (Charante-Maritime).
Its aims and missions are

- Monitoring air pollution all over the regionAnalysing air pollution phenomenon for better understandingInforming in case of pollution peaks
- Providing informations and advice on air pollution




Apart from their monitoring activities, the approved associations contribute to the application of "the recognised right of every person in the region to be able to access information on air quality". Therefore one of ATMO Poitou-Charentes main concerns in the wide-spread dissimination of assessment studies and measurement results.

The list of substances to be monitored is determined by french order, which also sets various objectives of air quality, limit values and alert thersholds with respect of concentrations levels in ambient air. The pollutants usually monitored are sulphur dioxide, nitrogen oxides, ozone, particle matters, heavy metals in ambient air but also pesticides and polyaromatic hydrocarbones, VOC's ...

ATMO Poitou-Charentes is established in 1976 to monitor air quality around the industrial area in La Rochelle. Over the years industrial air pollution decreased while traffic became more and more important. During the nineties the air pollution monitoring network changed its focus from industrial to urban areas Nowadays, urban and industrial impacts are under control. Nevertheless, each year, studies are made about these topics as ambient concentrations do not decrease as quickly as expected. Further, studies on agricultural emissions and indoor air-quality are of growing importance.Further information on the air quality in the Poitou-Charantes region is available at : http://www.atmo-poitou-charentes.org

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/20_ATMO_Poitou-Charentes_ERevelat.pps

## *Brief overview of the Air Quality Services of the ESA PROMOTE2 project*

*Eleni Paliouras, GA Center (DLR)/PROMOTE*

The PROMOTE2 project aims to build upon the successes of PROMOTE (Stage 1) in delivering the atmosphere GMES service element by delivering a sustainable and reliable operational service to support informed decisions on atmospheric policy issues. The five themes covered, based on user requirements and maturity of satellite and ground-based observations, are stratospheric ozone, surface UV radiation, air

quality, greenhouse gases and aerosols, and special services. In this presentation the PROMOTE2 Air Quality (AQ) services, which cover both monitoring and forecasting, are described.
One important aspect of the project, and all GMES Service Elements, is the involvement of Core Users. Within the PROMOTE consortium are representatives of international, national, and regional governmental and non-governmental organisations. Their experiences with the demonstration and operational products of the AQ Service will be presented, as will plans for sustaining the current services and its expansion.
More information is available at: www.gse-promote.org.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/21_PROMOTE2_briefing_EPaliourias.pps

### *Near real time air quality: results for 2006 and plans for 2007*
*Tim Haigh, EEA*

The purpose of 'Ozoneweb' (EEA web site on near real-time ozone) is to build a public website, based around near real-time ozone data. The result is published within the EEA main website. Links to data providers as well as to national and regional ozone websites are included and allow easy access to more local information. The project, which was launched in July 2006, includes a number of novel technologies and approaches which are made available for others to use.
It can be accessed here: http://www.eea.europa.eu/maps/ozone/welcome/
The web site allows the general public to track air quality in a specific region and on a European level. The web site displays ozone levels via a map of Europe. Background information on ozone and its health impacts are also provided. Key features of the site are:

- Live status data on ozone
- Most measurement stations in Europe (over 700)
- Advanced Internet mapping tool
- Interpolated maps
- Comparisons views
- Support factual texts

Partners in the countries have been involved in defining the products and supporting the creation of the functionalities. The approach to data exchange has been based around a set of principles which have contributed to successful widespread coverage. Plans for 2007 are to consolidate, improve systemisation and initiate extension.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/22_Ozoneweb_GMES_infoservices2006_07_THaigh.pps

### *Near real time analyzed maps of ozone of Europe*
Cécile Honoré *and Laurence Rouïl, INERIS, France*

The PREV'AIR system, devoted to air quality forecasting and mapping had been implemented in France in spring 2003. During the heat wave, it run each day allowing to anticipate the spatial and the temporal evolution of the ozone concentrations, and to keep the public informed. It is the result of a co-operative initiative between four organisations to gather skills and experience : the Agency of Environment (ADEME), the National Research Centre (CNRS), the National Institute

for industrial risks and Environment (INERIS) and the National Weather Services (Météo France).

PREV'AIR relies on a chain of numerical tools: air quality simulation models, modules ensuring the provision of meteorological and air quality input data to these models, modules enabling the extraction and use of the numerical data computed by the system. PREV'AIR provides atmospheric concentrations of ozone, particulate matter (PM10 and PM2.5) and nitrogen oxides, computed throughout Europe and France. Up to two days forecasts are available each day. Two models provide chemical simulations : CHIMERE developed by CNRS and INERIS and MOCAGE, developed by Météo France.
When they are available, near real time observations are used, to build the so-called "analyzed" maps that are considered as the most realistic description of pollution patterns. Indeed, these maps correspond to simulations corrected by observations using a kriging method (optimal interpolation). Such maps are available for ozone and PM10. This option is operational for France thanks to a near real time database named BASTER, which gathers all the measurements realized every three hours or each hour in France by the local air quality monitoring networks.

There is no difficulty to extend this option at the European scale as long as observations are available, and this is exactly one of the objectives of the PROMOTE project.
PROMOTE is a project funded by the European Space Agency and coordinated by the German Space Agency (DLR). It aims at developing operational services related to atmosphere monitoring. One of the components of PROMOTE is the "Integrated Air quality platform", an operational model system devoted to air quality forecasting and mapping at the European scale. Several models will bear the platform : the PREV'AIR models (MOCAGE and CHIMERE), EURAD (Germany), LOTOS-EUROS (the Netherlands) and SILAM (Finland). The project has just begun in 2006, but a first experience demonstrating the possibility to compute near real-time analyzed maps throughout Europe has been done with the CHIMERE model.

The European Environment Agency provided near real time ozone data collected in Europe through the "Ozoneweb" channel for three days in summer 2006. A map of the observation sites is given in figure 1. For one of these days (12th july 2006), the initial map representing ozone fields and computed by CHIMERE alone is presented on figure 2.a. The fields corrected using observations are given on figure 2.b. Figure 2.c show the amount of correction (difference between simulation and analysis) in the different geographical areas. When this indicator is negative (blue colors) it means that an underestimation of the model results has been corrected. This case occurs for this day in a large part of Europe, particularly in the South East and in the Benelux.
Scores have been calculated to check that the procedure makes sense. For instance root mean square error (RMSE) of the CHIMERE model is about 21.7 $\mu g/m^3$ for this day and for the available stations at rural sites . It decreases to 16.5 $\mu g/m^3$ for the analyzed fields applying a cross validation procedure. When evaluated at independent sites which have not been used to correct the ozone fields, RMSE is about 17.5 $\mu g/m^3$ which is quite good.

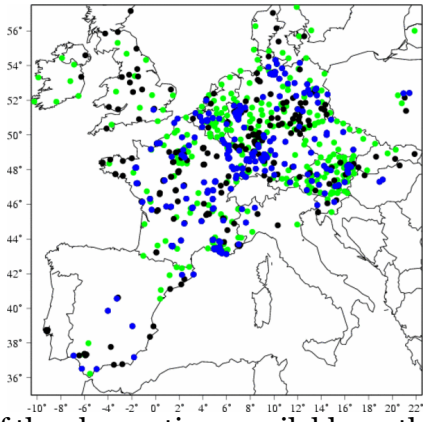
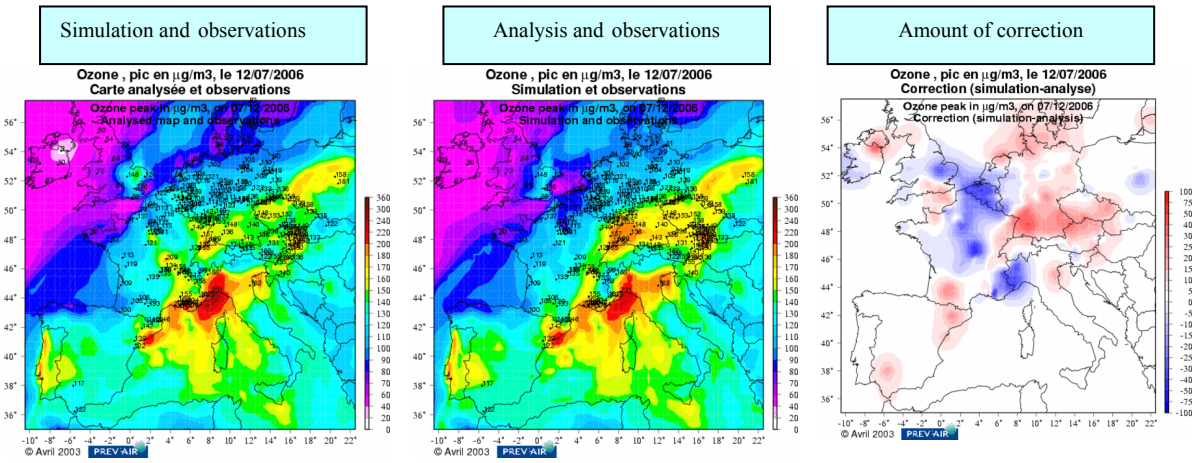


Figure 1 : map of the observations available on the 12th July, 2006




**(a)** **(b)** **(c)**

Figure 2 : Ozone fields computed the 12th July, 2006 : simulation (a), analysis (b), difference between simulation and analysis (c)

These preliminary results show the feasibility and the relevance of correcting ozone simulations using observations under near real time constraints. The kriging procedure is not time consuming which allows the maps to be updated, if necessary, several times a day when the observations are made available. This kind of information should be of high interest to follow and to understand the expansion of ozone episodes. Thus it is expected that public as well as policy makers in charge of air quality management should support such initiative.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/23_analzd_ozone_maps_LRouil.pps

## *Activities of WG-ENV of EUMETNET, COST Action on AQ networking AQ forecasting system*

*Sylvain Joffre, FMI, Finland (as* Chairman of EUMETNET WG-ENV)

EUMETNET is a network grouping 21 European National Meteorological Services (NMS), which provides a framework to organise co-operative programmes between its Members in various meteorological activities such as observing systems, data processing, forecasting products, R&D, and training. EUMETNET established in 1997 a Working Group on Environment (WG-ENV) with as main objectives:

- To improve understanding and co-operation between Members in the environmental area;

- To develop proactive coordinated relations with the EEA and other environmental organizations.

In order to implement these objectives, WG-ENV:

- develops exchange of information and know-how between Members,
- can recommend practices and propose EUMETNET Programmes to allow European citizens to benefit from the best possible meteorological information pertaining to the environment (e.g., Air Quality forecasting),
- maintain liaison with the EEA to serve its meteorological needs, and promote the European NMSs as providers of information and services to EEA,
- enlist the support of EEA for EUMETNET actions in favour of the environment;
- maintain liaison with relevant COST Actions and other international activities (e.g. GMES).

Rapid developments currently in Europe in connection to the EU/ESA GMES (Global Monitoring for Environment and Security) initiative has led WG-ENV to recently focus on supporting the preparation of activities towards the GMES Atmospheric Services (GAS). Some highlights were:

- Workshop with EEA (April 2005), where substantial interest was indicated for the collaboration between National Environmental Agencies (NEA) and NMSs in creating a real-time service,
- Cooperation with GEMS and PROMOTE in identifying needs, challenges, partners, etc.
- Involvement with ECMWF in drafting background papers for making a case for the GAS.
- Interactions with other stakeholders: EUMETSAT, DLR, EEA, ….
- Stimulating the preparation of a COST Action for complementing GEMS and PROMOTE activities towards a European Network of Air Quality Forecast and Information Systems.

There is currently a patchwork of players (European, national, regional, local; scientific and authorities, NMSs, NEAs, EEA, etc) in terms of model tools, monitoring data and institutional arrangements. The first milestone is the GAS Workshop organised in Brussels in early December 2006 to identify the main scope, aims, architecture, gaps, sustainability requirements and partnership for GAS. Thus, coordination through cooperation will have to be developed. The now accepted COST Action will be a flexible and neutral way to achieve some of these requirements. It will start in early 2007 and last 4 years. The main objective of the COST action will be: "*To setup a forum for benchmarking, harmonising and developing approaches and practices for chemical weather forecasting network and near-real-time information systems in Europe*". More specifically it will aim to:

- Identify needs for the optimisation and harmonization of exchange of AQ data & integration of modelling systems;
- Find out the gaps of existing knowledge and practices;
- Review the potential for and means of multi-model ensemble and chemical data assimilation;
- Develop QA/QC criteria for CW forecasting systems;
- Assess visualisation and dissemination platforms, arrangements, formats and protocols;
- Establish and/or strengthen links with similar ongoing national and international activities

The presentation develops and specifies these items.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/24_WGENV-COST_SJoffre.pps

### Summary of session 5

Much of the session dealt with the status and examples of services developed and being developed as a result of the GMES/PROMOTE project activities in the atmosphere field, where air quality assessment and forecasting is one of the 5 themes.

PROMOTE has a Public sector info and a Citizen sector info parts. The public sector info part is so far the most developed, and its AQ records service provides near-real-time data for users extracted from satellite observations. Examples of assessments where shown, such as European and regional maps of PM and ozone.

The Ozone-web of EEA provides an example of maps of European AQ based upon near-real-time data transfer procedures from a lot of European countries to the ozone-web server, a procedure developed by the ETC/ACC with interpolation and visualisation software developed under the EEA, and now in full service. The ozone-web contains state-of-the-art elements regarding the transfer, control and visualisation of near-real-time data on maps. Possibilities for combining the ozone-web with the GMES Service Element development is under investigation.

The French PREVAIR system for providing near-real-time maps of ozone in France and neighbouring areas is another example of functioning systems providing the citizen with on-line AQ data on maps, updated twice daily in the summer season. PREVAIR seeks bilateral cooperation with countries and organisations to enhance the applications of the system, and seeks also EEA cooperation in developing GMES/PROMOTE related services based upon the PREVAIR system. Examples of near-real-time maps, assessments and analysis were shown.

The activities under the EUMETNET network (of the 21 European Meteorological Services) were presented. One of the EUMETNET activities is to promote the forecasting of air quality in Europe. A COST Action is being set up with the objective "*to setup a forum for benchmarking, harmonising and developing approaches and practices for chemical weather forecasting network and near-real-time information systems in Europe*".

The session showed that the near-real-time services on air quality is developing, and the combined activities promise improved services in the future for the citizen on nrt and forecasted air quality on maps. This should be of large interest for the EIONET community.

## SESSION 6
## UPDATE ON EEA/ETC-ACC ASSESSMENT OUTPUTS

### Session chair: F. de Leeuw

#### *Air Pollution 2006 report*
*Steinar Larssen, NILU, Norway (ETC/ACC)*

This report presents the status on air pollution and its impact in Europe based upon the most recently available Europe-wide data, which includes data up to 2004. Both emissions (based upon EMEP) and air quality data (from AirBase) and assessments are presented. Data are generally available or up to 30 countries. Based upon that, an analysis of effectiveness of policies in also carried out and presented. The report concentrates on the health related pollutants: PM and its precursors, ozone and its precursors, and NO2, as well as on ecosystems related pollutants: acidifying and eutrophying compounds and their deposition as well as tropospheric ozone.

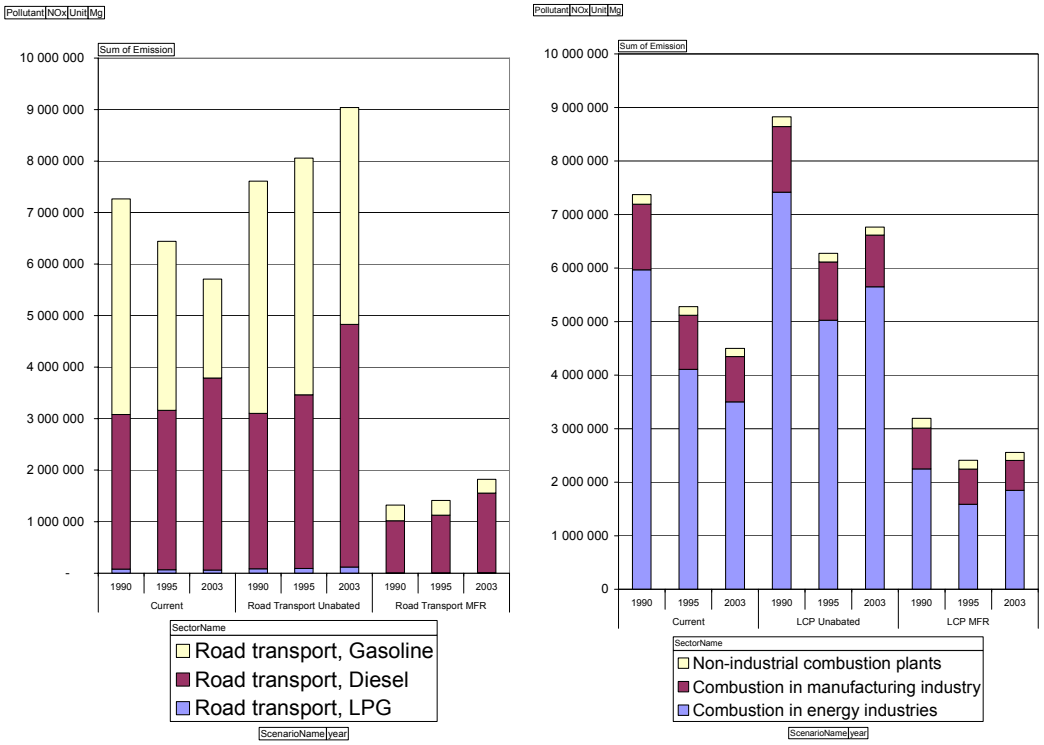
The report discusses the developments in emissions and concentrations/deposition since 1996-1997, when the data reporting to AirBase became substantial. The number of stations reported to AirBase has increased substantially also since 1996-1997. PM10 emissions and concentrations in Europe has been reduced by about 20% since 1997, although there are large variations between years which could be explained largely by variations in meteorological conditions between years. Also NO2 has been reduced by about 20% since 1006, quite in line with the NOx emission reduction. Average and high-percentile ozone concentrations, as well as the SOMO35 indicator have, however, been rather stable since 1996, although there are indications that the peak ozone concentrations are being reduced in some parts of Europe. In contract to this, the reported precursor emissions (in terms of tropospheric ozone formation potential, TOFP) have been reduced by more than 30% since then. This discrepancy is not easily explained.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/25_AP2004_report_SLarssen.pps

### *On Policy Effectiveness*

*Frank de Leeuw, MNP, NL (ETC/ACC)*

The European Union has developed a number of specific emission abatement policies. With respect to the currently most urgent problems on PM10 and NO2 the most important measures are the introduction of motor vehicle emissions regulations (the EURO standards) and of the large combustion plant regulation (the LCP directive). The effects of these policy measures are evaluated by estimating the emissions that would have been expected should these policy measures not have been taken (unabated scenario) and what potential emissions would be if policy measures are fully implemented (MFR scenario). Using the LOTOS/EUROS dispersion model the effect of the abatement measures on ambient concentrations has been evaluated.




*The effect in the EU25 of introducing vehicle emission standards in road transport (left) and emission abatement at large combustion plants (right) on the emissions of NOx*

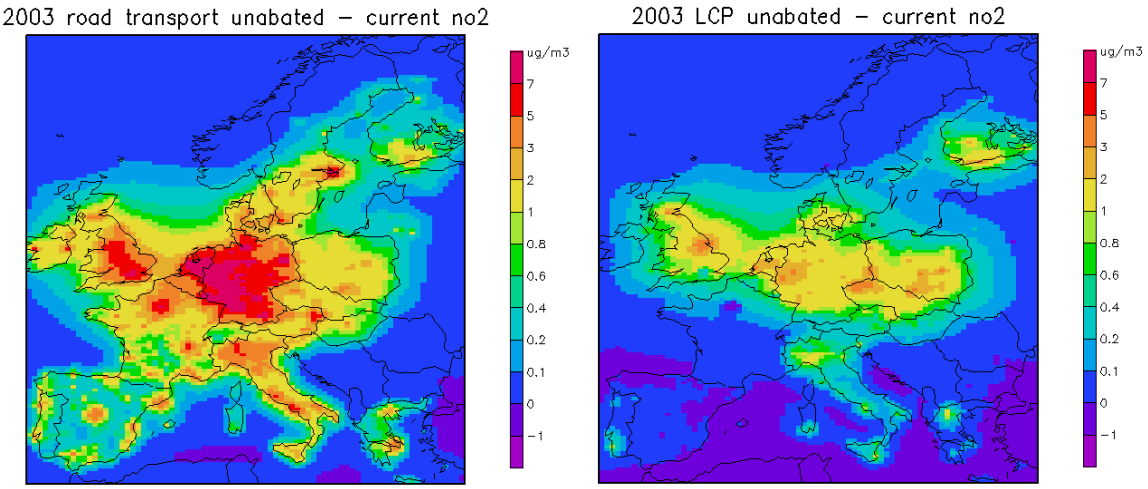
Taking NOx emissions as an example, the following observations are made:
*Road transport*:

- If abatement measures for road transport not had been implemented ("Road Transport Unabated") emissions from road transport would have increased from about 7.5 Tg in 1990 to over 9 Tg in 2004. Diesel fuelled cars would have been the main contributors, mainly due to the increasing share of diesel in road transport.
- Since part of the car fleet was already complying with the regulation, the emissions in 1990 would have been somewhat higher ("Current Situation").
- If the most stringent abatement technology for road transport ("Road Transport MFR") would have been implemented from 1990 onwards, emissions from road transport would have been to a factor of three lower than the actual emissions

*Large Combustion Plant Directive:*

- The large Combustion Plant Directive was introduced in the mid 1980s. New plants, constructed after 1987 in EU Member States should comply with more stringent emission standards. If the LCP Directive had not been implemented, emissions from Stationary Combustion in 1990 would have been 1.5 Tg higher.
- Since 1995 a further emission reduction has occurred compared to the unabated situation. This may reflect abatement in the new member states.
- Full abatement according to the LCP Directive would have resulted in almost another 2 Tg lower emissions from stationary combustion in 2004. Only half of the potential effect of the LCP Directive has been achieved by 2004.

The next figure shows the modelled difference in NO2 concentrations between the unabated situation and the actual 2003 situation.




- The following can be observed:
- $NO_2$ annual mean concentrations in a large part of North-Western Europe (UK, Netherlands, Germany) have fallen to 5-7µg/m³ below the level that would have occurred without road transport abatement measures.
- $NO_2$ ambient concentrations in major towns and cities have decreased by 3-5µg/m³ through this policy measure.
- Under a scenario of full compliance by the current traffic fleet with EURO standards (MFR scenario), a further reduction of about 7µg/m³ $NO_2$ in the most polluted areas is predicted.
- The introduction of the LCP Directive has yielded a smaller effect onambient concentrations of $NO_2$: in a band from central UK via the Netherlands and Germany to the southern border of Poland, $NO_2$ concentrations have been a few µg/m³ below the level that would have occurred without the implementation of the LCP directive.
- Full implementation of the LCP (LCP-MFR scenario) will result in a further reduction by 1-2µg/m³ $NO_2$

The introduction of the LCP-directive has resulted in a strong reduction in SO2 concentrations in particular in the area between 48 and 56° N covering the UK, BeNeLux, Germany and Poland. Under the MFR-scenario further reductions sre estimated.The effect of these policies on ozone is much more complex. Whilst in the Mediterranean area the introduction of these policy measures has decreased ozone concentrations, across a broad geographical band from the UK to southern Poland higher ozone concentrations have occurred. The same is seen in highly populated areas surrounding larger cities. Main reason for this behaviour is the complex O3/NOx/VOC chemistry.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/26_pol_eff_FdeLeeuw.pps

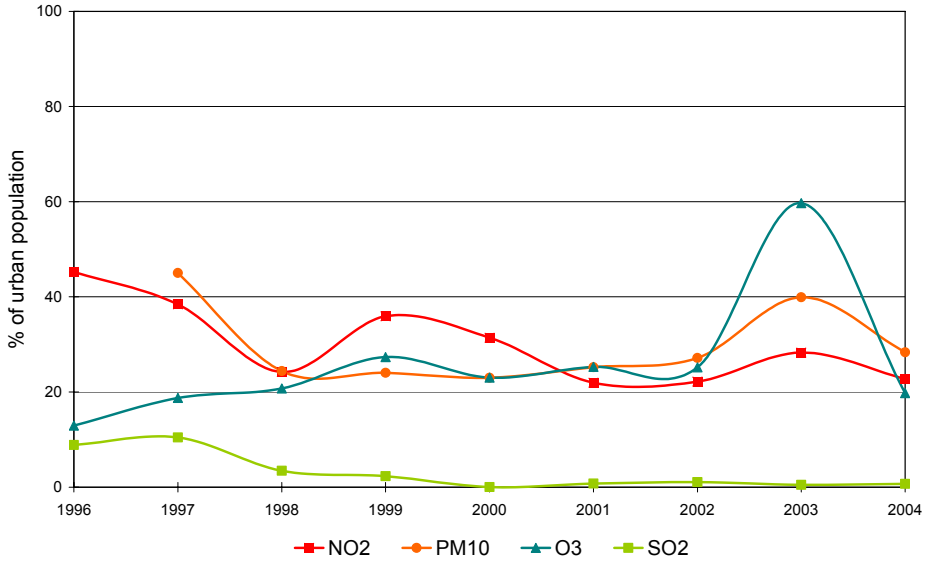
## *Europe's environment: the fourth assessment – the Belgrade report*

*Jaroslav Fiala, EEA*

Kiev Ministerial declaration called on EEA to prepare the fourth assessment report for the Environment for Europe ministerial conference which will be held in Belgrade in 2007.
A request is to produce a short, policy oriented, indicator based report responding to the Belgrade agenda - assessing progress on EECCA strategy as well on the 6th EAP. Report should reflect recent information, assess progress, provide benchmarking, be a basis for action and rise awareness where needed.
The air quality part of the report starts with an overview of the progress in air quality protection policy, gives an analysis of air emission and outdoor air quality trends based on EEA core indicators, summarises impact of air pollution on the public health and the environment and shows envisaged prospect and strategies for further progress in air quality protection.

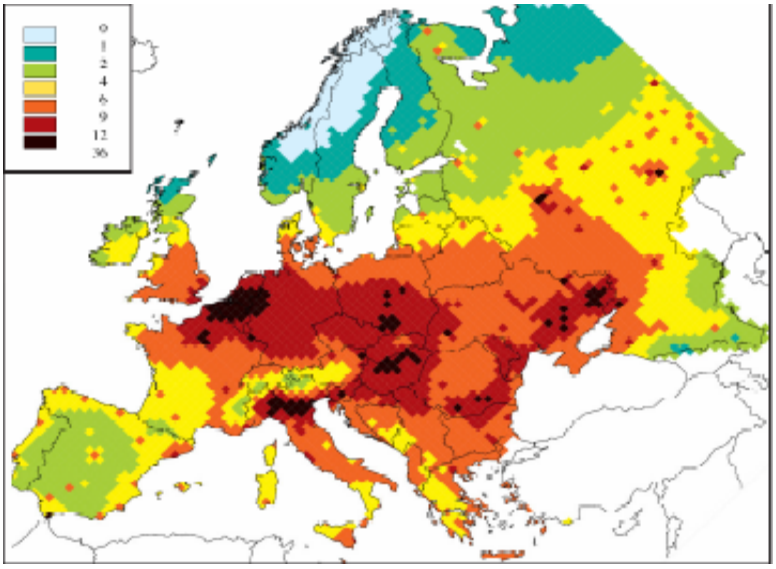
**Main messages**

- Despite continuing emission reduction of atmospheric pollutants the exposure of Europe's population since the late 1990s has not improved, partially due to meteorological conditions in recent years. Ambient concentrations particulates have remained largely stable since 2000. By 2004, most urban areas still exceeded limit values.
- Ozone is also a widespread problem. The health-related target values are frequently exceeded in southern and central Europe and less frequently in eastern and north-western Europe.



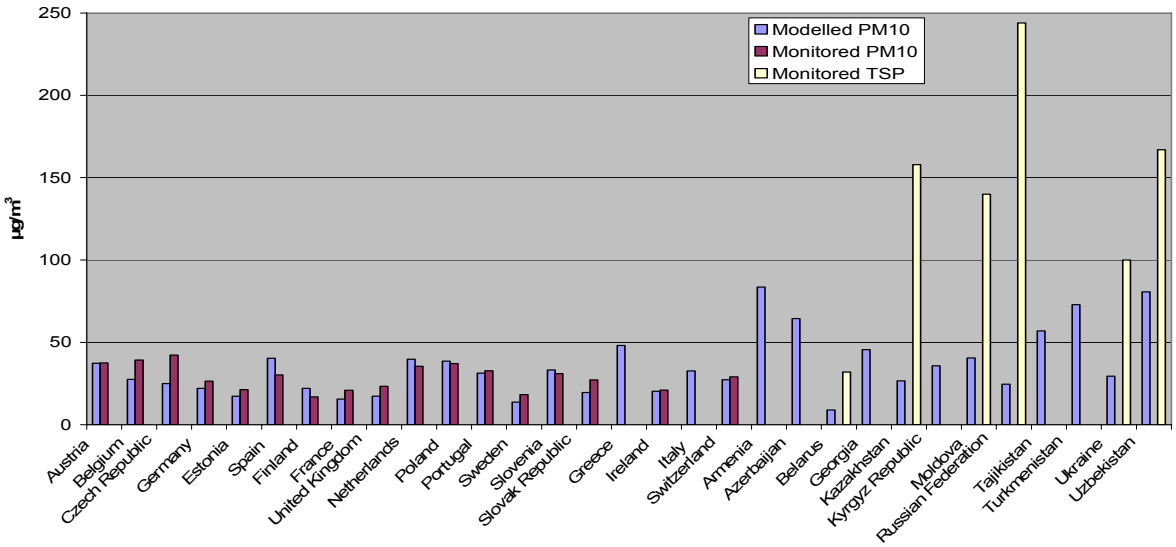

*Percentage of urban population in EEA region exposed to air pollution over limit values and target values*

- Air pollution by fine particles and ground level ozone continues to pose a significant threat to human health: it shortens average life expectancy in north-western Europe by almost one year and affects the healthy development of children.

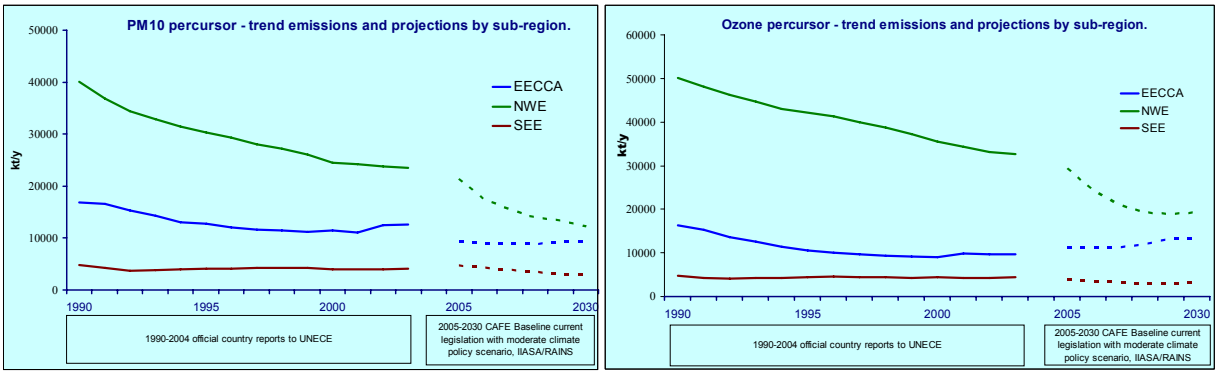


*Reduction in life expectancy ( in months) caused by exposure to air pollution*

- In EECCA, the poor quality of the data precludes in-depth assessment of the state of air quality and its consequences. The limited data available indicate that the main health threats from air pollution are also from small particles and their toxic constituents.
  - Emissions and exposures to the public and ecosystems in NWE are projected to fall significantly by 2020 as a result of the continuing systematic and well-concerted efforts being paid to air pollution problems.
  - Emissions in EECCA are expected to rise, with consequent worsening in air quality. Stronger efforts will be needed to achieve levels of air quality that do not give rise to significant threats to human health and the environment.



*Annual $PM_{10}$ urban concentrations, calculated by GMAPS and monitored $PM_{10}$ concentrations in EEA countries, averaged through urban background stations, and TSP concentrations monitored in EECCA*




*Trend emissions by Europe sub-regions, 1990-2003: official country reports to UN/ECE-EMEP, 2005-2030 projection (CAFE baseline current legislation with climate policies) IIASA/RAINS*

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/27_AQ_EEAandEECCA_4th_ass_Belgrade_rep_JFiala.pps

## *Air Pollution by ozone in Europe in summer 2006: preliminary results*

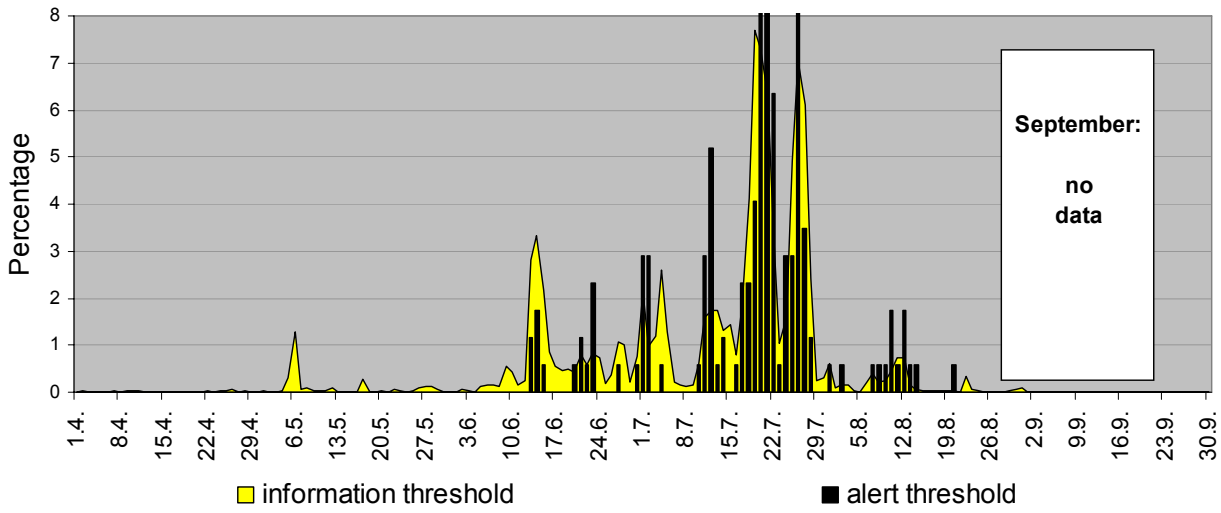
*Libor Cernikovsky, CHMI, Czech Republic (ETC/ACC)*

Under the ozone directive (2002/3/EC) MS shall provide:

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

Reporting forms, guidelines documents and other information are available on the ETC/ACC web page http://air-climate.eionet.europa.eu/databases/o3excess (with links to EEA web pages).
Summary information is published monthly on the same web page.

Following preliminary results are based on data received before 6th October 2006, i.e. no all August and no any September data was available.
Distribution of exceedances during summer on day-by-day basis




Distribution of exceedances during summer on month-by-month basis

| Month | Stations with exceedance (2) [number] | | [%] | | [%] | Total nr. of exceedances | | Nr. of days with exceedance (3) | |
|---|---|---|---|---|---|---|---|---|---|
| April | 9 | - | 0 | - | - | 13 | - | 10 | - |
| May | 133 | - | 7 | - | - | 166 | - | 19 | - |
| June | 441 | 8 | 23 | 0 | 2 | 1170 | 16 | 28 | 9 |
| July | 966 | 81 | 51 | 4 | 8 | 4352 | 143 | 31 | 22 |
| August | 72 | 11 | 4 | 1 | 15 | 258 | 14 | 25 | 10 |

White columns refer to information, grey to alert threshold
(2) The number and percentage of stations at which at least one threshold exceedance was observed; fifth column: percentage of stations with information threshold exceedance at which alert threshold exceedances were also observed.
(3) The number of calendar days on which at least one exceedance of thresholds was observed.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/28_Summer_ozone2006_LCernikovsky.pps

## Summary of session 6

The ETC/ACC air pollution assessment activities in 2006 included the Air Pollution report (finalisation, data up to and including 2004), an ex-post assessment of abatement policies, the draft Belgrade assessment report, and the summer ozone reporting.

In the AP report, it is concluded that PM10 and NO2 concentrations and extent of exceedances are presently on a reducing trend. Year-to-year variations have been explained by meteorological variations, especially the increasing development in PM10 concentrations between 2000 and 2003, with a large drop in 2004. Emissions and concentrations of PM10 and NO2 have both been reduced by about 20% since 1996-1997, for Europe as a whole, when account is taken of the meteorological variations. The report in based upon data from 30 EEA Member Countries.

Policy effectiveness have been studied through modelling runs (using the LOTOS-EUROS model), with unabated emissions, actual emissions, and 100% (theoretical) abatement at selected years between 1990 and 2003, showing the actual effect of the

abatement measures. Those studied are vehicle and LCP emissions regulations, which has been shown to explain much of the resulting improvement in air pollution levels in Europe over that time.

The Belgrade report add assessments of the air pollution situation in the EECCA countries. Data from those countries are lacking and generally of poor quality. Contrary to North-West Europe where air pollution concentrations are expected to be significantly reduced towards 2020, the expectations are of increased emissions in the EECCA countries, unless additional actions are taken.

The 2006 summer ozone reporting from the EEA Member Countries was rather complete. Exceedances of ozone concentrations took place at about the same extent as in 2005, but significantly lower than in 2003 which was a peak year. However, 2005 and 2006 had more exceedances than in earlier years (before 2003) in North and Central Europe, but fewer than earlier in South Europe. In 2006, exceedances of the information threshold was widespread and frequent, and exceedance of the alert threshold was also frequent. Exceedances were reported on a total of 41 days in the summer of 2006 (data were not yet available for September at the time of the workshop).

Concluding, ETC/ACC assessments cover the last decade development of air pollution levels as compared with emissions, policy effectiveness has been studied, and up-to-date summer ozone reporting is carried out.

## POSTER SESSION

The following posters were presented:

Karen Van de Vel
VITO, Flemish Institute for Technological Research, Belgium:

MONITORING HUMAN EXPOSURE TO AIR POLLUTION USING THE AURORA AIR QUALITY MODEL

Jana Ostatnická et.al.
Czech Hydrometeorological Institute:

AIR POLLUTION IN THE CZECH REPUBLIC IN 2005

Karin Sjøberg et. al.
IVL Swedish Environmental Research Institute:

THE URBAN MODEL QUANTIFIES GENERAL POPULATION EXPOSURE TO AIR POLlUTION

# WRAP-UP AND CONCLUDING REMARKS

EEA and ETC/ACC presentations demonstrated how EEA continues in the development of the air data centre, focussing on collection, management, quality-assurance and web presentation of air quality (and air emission) data.

EEA is continuing in merging the dataflow in the FWD Questionnaire and in EoI. This enables a revision of the reporting requirements. Streamlining the data flows will require a close cooperation between DG Environment, the Member States and the EIONET community.

Near real time data exchange is generally well accepted and the needs for further improvements were presented and discussed. Future development would be focused to streamline this activity with summer ozone exceedance reporting, and extend it towards other air quality parameters.

Cooperation with AQUILA will continue to further improve the quality of monitored and reported air quality data.

The wrap-up discussion revealed that participants found the programme and presentations very interesting, but that the programme was a bit overloaded as has been the case also earlier years. We are in a good position to have many topics to cover in our EIONET workshops, but need to continue to see to it that the time available is large enough. This year's workshop was effectively a 1 ½ day workshop, planned so as to allow participants to return home on Friday. This may always be a need, however, it seems clear that these EIONET workshops always have to be planned for 2 full days.

The parallel session experiment came out as a good development. This year, the modelling topic was covered to a larger extent than in earlier workshops, and the parallel session opened the opportunity to allow for this, and at the same time allow for more in-depth technical discussions related to data reporting, transfer, data base issues.

It is probable that the modelling topic will continue to be covered in the EIONET workshops, and probably increase in extent. To allow for this, the parallel session practice will probably need to be used more.

It was remarked that the jargon and all abbreviations used by those well inside of the various fields of research and related activities makes it hard for some participants more on the administrative side to follow and understand fully the presentations and their implications. This is a valid comment which should be addressed during the planning phase of the newt workshop.

The question of venue for the next workshop was discussed. Cyprus offered to explore options to host the workshop in 2007. Volunteers for 2007 organising committee was asked for. This will be followed up.

# ANNEX 1. WORKSHOP AGENDA

Link to Workshop Agenda: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/03d_eionet_aq_agenda.doc

# 1st day: Thursday 26 October

| | | |
|---|---|---|
| 09:00-09:20 | Welcome, scope and goal of the workshop (ETC-ACC, EEA)<br>Follow-up 10th AQ workshop | Rob Swart,<br>Jaroslav Fiala |
| ***Session 1. General aspects of air quality data and data flows*** | | |
| 09:20-09:50 | CAFÉ directive and Implementing provisions | Andrej Kobe, DG Env |
| 09:50-10:10 | New WHO Air Quality Guidelines | Michal Krzyzanovski, WHO |
| 10:10-10:30 | Classification and assessment of representativeness of Air Quality monitoring stations | Wolfgang Spangl<br>UBA, Austria |
| *10:30-10:50* | *Coffee* | |
| 10:50-11:05 | Correction of PM10 measurements, French approach | Joelle Colosio,<br>ADEME, France |
| 11:05-11:20 | Study of PM correction factors in the UK (Link to the report: http://www.airquality.co.uk/archive/reports/cat05/0606130952_UKPMEquivalence.pdf ) | Janet Dixon<br>DEFRA, UK |
| 11:20-11:40 | **Discussion** | |
| ***Session 2A: AQ data and metadata exchange and Airbase*** | | |
| 11:40-12:00 | The 2004 data reporting cycle<br>Seen with the eyes of the ETC/ACC:<br>• Where do we stand three weeks after the deadline<br>• Time schedule<br>• Changes in feedback procedure<br>Seen with the eyes of the data suppliers:<br>• Problems, bugs in DEM, CDR submission | Patrick van Hooydonk<br><br>Wim Mol |
| 12:00-12:15 | Linking AirBase with geo-info.<br>• Linking stations with EuroBoundaryMap database | Wim Mol |
| 12:15-12:30 | Future developments of Air quality information system<br>• An integrated control of EoI and AQ questionnaires (pre-filling worksheets of Q-FWD)<br>• Testing continuation of time series<br>Suggestions from MS | Wim Mol |
| 12:30 -12: 50 | Future developments: Air quality in the Shared Environmental Information System (SEIS), dissemination of air quality information<br>• Google Earth link to air quality monitoring stations<br>• Standard assessment output<br>Suggestions from MS | Sheila Cryan (EEA),<br><br>Wim Mol |
| 12:50-13:00 | **Discussion** | |
| *13:00-14:00* | *Lunch* | |

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| ***Parallel sessions:*** *14:00-15:30* | | |
| ***Session 2B: Discussion session on technical issues related to data exchange*** | | |
| 14:00-15:30 | Discussions on technical issues, as a continuation of Session 2A.<br><br>Part of the session will be devoted to AQ/QC issues, such as:<br><br>QA/QC: the use of quality flagging in DEM/Airbase | Headed by Wim Mol / Frank de Leeuw |
| ***Session 3: Support to air quality assessment by modeling and mapping*** | | |
| 14:00-14:20 | European scale AQ mapping (using interpolation and assimilation) and evaluation of its uncertainty | Jan Horálek, ETC-ACC, CHMI |
| 14:20-14:40 | Modelling the spatial distribution of particulate matter in Switzerland | Rudolf Weber, Bundesamt für Umwelt BAFU, Switzerland |
| 14:40-15:00 | Urban-scale air quality modelling with AURORA – a review of results from recent projects | Koen De Ridder, VITO, Belgium |
| 15:00-15:20 | Land use patterns and spatial interpolation of air pollution measurements | Stijn Janssen, VITO, Belgium |
| 15:20-15:30 | **Discussion** | |
| *15:30-16:00* | *Coffee* | |

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| ***Session 4: Air quality assessment and management as required by FWD*** | | |
| 16:00-16:20 | MSs' reporting under the Directives, status and results | Frank de Leeuw |
| 16:20-16:40 | European mapping of air quality in zones and agglomerations | Roman Tuček CHMI), Jaroslav Fiala (EEA) |
| 16:40-17:00 | EU project Development of Estonian Air Quality Management System- actions and outcomes | Pauklin, Tarmo Estonian Environmental Research Cente |
| 17:00-17:20 | Future development scenarios for traffic system and air pollution in Riga city. | Iveta Steinberga, Latvian Environment, Geology and Meteorology Agency |
| 17:20-17:30 | **Discussion** | |

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| | Visit to local monitoring network | |

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| *19:00* | *Dinner offered by IFEN* | |

# 2nd day: Friday 27 October

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| ***Session 5: Exchange of up-to-date information on air quality in Europe*** | | |
| 08:30-09:00 | On the air pollution situation in the La Rochelle region | Edwige Revelat, ATMO Poitou-Charentes |
| 09:00-09:20 | Brief overview of the Air Quality Services of the ESA PROMOTE2 project | Eleni Paliouras, GA Center (DLR)/PROMOTE |
| 09:20-09:40 | Near real time air quality: results for 2006 and plans for 2007. | Tim Haigh EEA |
| 09:40-10:00 | Near real time analyzed maps of ozone over Europe | Laurence Rouil, Ineris, France |
| 10:00-10:20 | Activities of WG-ENV of EUMETNET, COST Action on AQ networking | Sylvain Joffre, FMI, Finland |
| 10:20-10:40 | **Discussion** | |
| *10:40-11:00* | *Coffee* | |
| ***Session 6: Update on EEA/ETC-ACC assessment outputs*** | | |
| 11:00-11:20 | Air Pollution 2006 report (w/2004 data) | Steinar Larssen |
| 11:20-11:40 | On Policy effectiveness | Frank de Leeuw |
| 11:40-12:00 | Europe's environment: the fourth assessment – the Belgrade report | Jaroslav Fiala |
| 12:00-12:20 | Air pollution by ozone in Europe in summer 2006 – preliminary results | Libor Černikovský |
| 12:20-13:00 | **Discussions, conclusions** | |

# ANNEX 2. LIST OF PARTICIPANTS

Link to List of Participants: http://air-climate.eionet.europa.eu/docs/meetings/061026_11th_EIONET_AQ_WS/04d_eionet_aq_participants.pdf

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