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European Topic Centre on Air and Climate Change

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SUMMARY AND CONCLUSIONS

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 14th EIONET workshop was held in Warsaw in Poland on 05-06 October, 2009. There were 79 participants from 24 countries and including representatives from the European Commission, DG Environment (DGEnv) and the Joint Research Centre, and World Health Organisation (WHO). 23 presentations were given in 6 sessions.

The workshop was hosted by the Chief Inspectorate for Environmental Protection in Poland. The director of the Department of Monitoring and Environmental Information Lucyna Dygas-Ciolkowska, welcomed the participants on behalf of the Chief Inspectorate for Environmental Protection. The participants where then welcomed by Ms. Aphrodite Mourelatou, Head of EEA's Air and Noise Group.

Session 1

Results of the JRC quality assurance programme for PM2.5/PM10:

- More than 90 % of PM10 and nearly 80 % for PM2.5 measurements in the range Limit Value ± 25% comply with the data quality objectives (DQO) set by EU Air Quality Directive;
- Near 50% of the L.V., the uncertainty of PM2.5 is likely to be comparable to the reduction targets set by EU AQD for that level.

Assessment of PM2.5 concentrations and health impacts at a European level:

- The PM2.5 monitoring network is still not in place in all member states (MS);
- The 24-hour average limit value for PM10 is more stringent than the annual average target value for PM2,5;
- There has been no observable trend in PM2.5 concentrations in the last five years;
- The central-eastern Europe have the highest population exposure to exceedances of the annual average 25 ug/m3 target value for PM2,5;
- The estimated average exposure index (AEI) for 2007 varies between about 10 ug/m3 in Finland to above 30 ug/m3 in Bulgaria, across EU-27;
- Meeting the AEI reduction target requires reductions of 10% (Scandinavia) to more than 25% (in central- and south-eastern Europe);
- The health benefits of the AEI reduction target are much larger than just assuring target value compliance across Europe.

PM trends in the Netherlands:

- In the Netherlands all PM concentrations went down since the nineties but after 2000 trends flattened.
- PM10 trend appears to be in line with the relevant emission trends, despite considerably variability from year to year, due to meteorology, and uncertainties related to secondary aerosols, water and sea salt.

PM2.5 discussion session:

- Some countries have implemented more PM2.5 monitoring stations for the AEI than the minimum, in order to account for possible needs to:
  - move stations, change station classification during the next 10 years
  - reduce the uncertainty and climatic/topographic/etc. variability in the AEI calculation.

- Other countries have implemented the minimum number of stations imposed by the directive and are concerned about the difficulty of assuring a constant monitoring network over the future 10 years.

- Challenges concerning the calculation of the AEI reduction over 10 years:
  - inaccuracy of measurements (25% acceptable for daily averages, 10% for yearly mean);
  - how to discern emission-induced trends from effects due to meteorological variability, sea salt variability, etc
- Particularly in eastern European countries, where PM concentrations are partly very high, it appears unrealistic to aim at a reduction target of 25% reduction in 10 years. Many of those countries have not yet established a (stable) monitoring and/or clear mitigation plans.
- The PM2,5 speciation measurements in rural background stations have to be harmonised between the national authorities and the EMEP community. The European Commission expects to issue Guidance for implementation of PM2,5 speciation measurements on rural background stations in June 2010.

Session 2

Effectiveness of European air emission reduction measures:

- Significant reductions in emissions, concentrations and impact are found to be a result of the introduction of the policies and reduction measures for road transport and large industrial combustion emissions between 1990 and 2005;
- By a full implementation of the current measures, further reductions of the pollutants will be achievable.

AirWatch: Near real-time data for European-wide air quality indices

- AirWatch relies on near real time (NRT) data provided by the MS to EEA in order to provide air quality information to the European public. AirWatch calculates air quality indices, based on NRT measured data and modelled data from GMES MACC, alongside citizens' observations on air quality.

Session 3

Summer ozone 2009 (preliminary results):

- The number of the 1-hour information and alert thresholds exceedances, as well as the number of days with exceedances of daily maximum of 8-hour average, were not exceptional in comparison with previous summer seasons.

EoI and Air Quality Questionnaire:

- 34 Member States provided EoI 2008 data and there was a very good response on the feedback. The data and feedback results were available in AirBase March 2009 on EEA Data Service.
- 11 MS make use of national station codes; list of 232 overlapping stations has been reduced to 34;
- 29 MS have provided EoI2009 data; 8 MS have included historical data in EoI2009 delivery.
- Data quality improved in the 2007 data cycle. Voluntary information on zone area and population was supplied by Member States for almost all zones. The consistency in monitoring station coding between Questionnaire and EoI reporting has also improved from 83% to 98%.
- In 2007 the number of zones in exceedance improved slightly for PM10 (-3%) and worsened for O3 (+7%).

Session 4

State of the environment report 2010 Part B - Atmospheric Pollution:

- Several hundred thousand people are still estimated to die prematurely each year due to exposure to particulate matter (PM);
- Up to 60% of the urban population has been exposed to levels of PM, ozone and nitrogen dioxide that exceeded the EU limit and target values.
- Many Member States did/will not comply in the attainment years of legally binding AQ limit values(2005, 2010).
- Sensitive ecosystem areas receiving excess acidifying air pollutants will have decreased by more than 80 % by 2010 compared to 1990.
- Excess nitrogen deposition contributes considerably to the problem of nutrient oversupply in ecosystems, which is in conflict with the EU's long-term objective (2020) of not exceeding critical air pollutant loads in sensitive ecosystem areas;
- There is clear evidence that ambient ozone concentrations in Europe cause e.g. visible leaf injury, growth and yield reductions. The long-term objective given in the EU AQ Directive as well as the EU target value (2010) are frequently exceeded.
- Only 14 EU Member States anticipate they will meet all four of the pollutant-specific emission ceilings in the EU's NEC Directive (2010).
- Improved coherency of air legislation with climate change policy actions is required to fully capture synergies between air pollution and climate change mitigation.

State of the environment report 2010 Part C – Country presentations:

Poland:

- Despite constant air quality improvement in Poland the problem remains in respect to particulate matter in the winter season and ozone in the summer.
- Combustion sources, in particular households using crude coal, and road transport are the major sources of PM in Poland.
- In a few urban locations high concentrations of nitrogen dioxide occur. Concentrations of other pollutants such as sulphur dioxide, carbon monoxide, benzene or heavy metals in PM10 seem to be no longer a threat.
- Despite significant economic growth during the last decade, Poland has lowered emissions of SO2, NOX and NH3. Several mitigation measures and programmes are expected to improve air quality in Poland over the next years.

Norway:

- There are presently some exceedances of PM and NO2 LVs in urban hot spots in Norway.
- Modelling in Norwegian cities show that PM levels will be substantially reduced by 2020, mainly due to the large reduction in emissions from vehicles and domestic wood burning. Particularly an increase in non-studded winter tyres will improve considerably concentration levels.

Austria:

- Major AQ problems in Austria are related to PM10, NO2 and ozone. Adverse climatic conditions in valleys and regions south-east of the Alps play a major role for limit value exceedances. There is no clear trend in pollution levels; the decrease in PM10 concentrations since 2007 can be largely attributed to meteorological conditions.

Germany:

- Though emissions have decreased during the last two decades significantly, exceedances of limit values for PM10, NO2 and target values for O3 still occur.
- Trends in ambient concentrations between 1995 and 2007 show:
    - for NO2 mostly decreasing in urban background stations and falling or stagnating trends on rural background stations;

- for PM10 the trend is significantly decreasing for urban stations and there is no clear trend in the regional background;
- for O3 there is a significant increase in urban stations and no clear trend in rural background.

Inputs from the PROMOTE / MACC projects (GMES Atmosphere Services):

- Combining both air quality model results and NRT observations, using data assimilation techniques, results in sophisticated air quality maps, which contribute to understanding of air pollution episodes, as well as raising awareness of the general public and policy makers. The future GMES atmospheric services aim at promoting and disseminating such products.

Session 5

Discussion paper on air quality indicators:

- The review of current methodologies for the calculation of the Indicators on Urban Air Quality at the European level (Structural Indicator, Urban Audit indicators and the Core Set of Indicators) present the following main recommendations:
  - streamlining the input requirements of the indicators;
  - reconsider the presentation of indicators: uncertainties, spatial variation and change in concentration levels;
  - review target European population (total, urban, size of urban areas);
  - include annual mean values of PM2.5 in all three indicator sets;
  - consider the development of indicators on air pollution health impact.

FAIRMODE:

- In order to bring together air quality modellers and model users, a Modelling Guidance document is under development, as part of the activities of FAIRMODE. It provides descriptions, interpretations, links, references and good practice examples for air quality modelling activities related to the European air quality directive.

Session 6

Update on the Directive on Ambient Air Quality and Cleaner Air for Europe, status of the implementation:

- Implementation of directive 2008/50/EC is following the scheduled agenda.
- The time extension exercise has shown that several MS have been lagging behind with AQ management, in particular as regards the estimation of the impact of abatement measures and the related projection of air quality levels.
- There is now an increasing awareness of the need to take action and in particular to improve the tools used for air quality management and planning.
- New and updated air quality plans are also being adopted. The quality of the plans has increased compared to previous years.

CAFE/SEIS/INSPIRE project overview:

- The project “Development and demonstration of technical IT solutions for data exchange and reporting under the CAFÉ Directive using INSPIRE services” should contribute to the finalisation of the Implementing Provisions.
- The results should help highlighting potential deficiencies in the current reporting mechanisms and propose common solutions.
- The expected project calendar fits well with the CAFÉ Roadmap (transposition deadline 11 June 2010) and the INSPIRE Annex III data specifications work (starting early 2010) on environmental monitoring facilities.

Cooperation of EMEP/CCC and EEA on near real-time (NRT) data:

- EEA and EMEP have carried out a feasibility study to clarify the different needs for NRT AQ data and provide recommendations on a strategy on data sharing and exchange;
- EEA needs NRT data to inform the public and to support the EU policy cycle for air quality legislation, while EMEP needs NRT AQ to improve the understanding of atmospheric processes, impacts of air pollution and their links to climate.
- For the few parameters and sites where there is an overlap in EMEP and EEA needs, it is necessary to avoid duplication of NRT data transmission, by re-using capacities and data.

NRT data needs from the pre-operational GMES Atmospheric Core Service (GAS):

- The EIONET can contribute to the GAS by provision of existing NRT data through EEA; identification of new possible NRT data from national research programmes; support the definition of metadata standards and feasibility analysis of data exchange systems.
- GAS can be useful to the EIONET community by providing:
  - regular feedback on the quality of the in situ observations,
  - common validation with ensemble of models,
  - common evaluation of the state of air pollution in Europe (SOER support)
  - Better forecast of environmental emergency situations through data assimilation
  - Better understanding of the coupling between air pollution and weather flows
- GAS products and ensemble model results contribute to determine how to control and reduce the impact of air pollution under climate change.

Update on EEA's near real-time air quality data work: O3, NO2, PM10:

- EEA has recently requested the Eionet community to extend NRT data submission from ozone to NO_2,NO_x, PM_{10}, $PM_{2.5}$, SO_2 and other parameters, as well as to re-transmit NRT AQ data, after initial quality controls, in order to ensure consistency between national/regional and EEA databases.
- The provision of near real-time air quality data and the data exchange with Eionet countries should be consolidated, in order to better support the many foreseen uses (Ozone web, AirWatch and GMES services) and avoid duplication of NRT data transmission.
- It is therefore necessary that EEA, the Eionet NRT network, EMEP and the GMES Atmospheric Services cooperate in the establishment of flexible standards for NRT data exchange and metadata description. In particular, they should refine the description of requirements on timeliness and agree on common standards for metadata description and flagging systems and this should be linked to INSPIRE processes and standards.

Contents

INTRODUCTION

The presentations and background documents at the workshop can be found at this link: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

Abstracts from the presentations have been included in the sections below; discussions, questions and answers are also summarised.

Web links to each presentation are also included under each presentation abstract.

Welcome address by host

Lucyna Dygas-Ciolkowska, Polish Chief Inspectorate for Environmental Protection

The director of the Department of Monitoring and Environmental Information Lucyna Dygas-Ciolkowska, welcomed the participants to Warsaw and to the 14th EIONET Workshop on behalf of the Chief Inspectorate for Environmental Protection. Lucyna informed that Poland has a long history of AQ monitoring and it has been changing to more automatic stations for the last 10 years. The new CAFE directive requires further network development and Poland is now adjusting to the new requirements.

Welcome, agenda of the meeting

Aphrodite Mourelatou, EEA

Aphrodite Mourelatou, from the European Environmental Agency, welcomed the workshop participants and thanked the Polish Chief Inspectorate for Environmental Protection to host the 14th EIONET Workshop. Aphrodite presented the new EEA organisation structure, after the reorganisation in 2009, with focus on the air and climate change programme and the EEA's Air Quality & Noise team and work. Aphrodite also informed about the ETCs review process and that there will be a new call for tender a new ETC/ACC consortium in January 2010 to start in 2011. Finally the agenda of the 14th EIONET Workshop was presented.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/01_Welcome_AQEionet09_AMourelatou.pdf

SESSION 1
PARTICULATE MATTER WITH SPECIAL FOCUS ON $PM_{2.5}$

Session chair: Sheila Cryan, EEA

Preliminary results of the QA/QC programme for PM_{10}/$PM_{2.5}$ in Europe

Claudio A. Belis - European Commission JRC ERLAP

ABSTRACT

Claudio A. Belis
European Commission JRC ERLAP

A QA/QC programme aiming at assessing the measurements of PM_{10} and $PM_{2.5}$ of national reference laboratories (NRL) and local networks was coordinated by JRC – ERLAP in collaboration with the network of laboratories AQUILA.

Since it is not possible to create a primary standard for particulate matter (PM), the mobile laboratory of JRC – ERLAP carried out parallel measurements of PM_{10} and $PM_{2.5}$ in 18 EU Member States. The uncertainty between two identical PM_{10} systems sampling in parallel is negligible, so that their means of 24 hour samples are used as reference values.

In general, the reference and the measurements of NRLs using gravimetric methods are in good agreement. The highest discrepancies are observed in the extremes of the mass range (very high or very low concentrations).

Continuous methods present more evident differences with respect to the reference than gravimetric methods. This is partly due to the different operation principles and treatment of the sample (e.g. heating). For this kind of measurements the application of a correction factor often results in an improvement of the data quality.

More than 90 % of PM_{10} measurements in the range Limit Value ± 25% comply with the data quality objectives (DQO) set by EU Air Quality Directive. The compliance falls to less than 80 % for $PM_{2.5}$ in the range L.V. ± 25% . Moreover, near 50% of the L.V., the uncertainty of $PM_{2.5}$ is likely to be comparable to the reduction targets set by EU AQD for that level.

The non negligible loads observed in travelling blanks suggest an interaction of the filter matrix with sampling air that may significantly contribute to the uncertainty budget.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/02_QAQC_PM_AQEionet09_CBelis.pdf

Assessment of exposure and health impacts of PM2.5 at a European level

Frank de Leeuw - Netherlands Environmental Assessment Agency (PBL) , ETC/ACC

ABSTRACT

Frank de Leeuw[1], Jan Horalek[2]
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A European $PM_{2.5}$ concentrations map has been prepared on the basis of PM_{10} concentrations maps using $PM_{2.5}/PM_{10}$ ratios inferred from measurements. Different $PM_{2.5}/PM_{10}$ ratios are used depending on location and type of station. The resulting $PM_{2.5}$ map is used to compare the current (2005) concentrations with the limit and target values as laid down in the Air Quality Directive. An annual mean concentration of 25 µg/m3 (target value for 2010, limit value for 2015) is exceeded in 12 out of the 27 EU Member States. As the map has a spatial resolution of 10x10 km, more exceedances are to be expected at hot-spot locations (city centres, traffic situation, close to local sources). A first estimate of the health related *Averaged Exposure Indicator (AEI)* has been made for each of the Member States. This AEI is the averaged level at urban background locations throughout the territory of a Member State and it reflects the population exposure. By 2020 the AEI has to be reduced with a certain percentage depending on its value in 2010. This exposure reduction target ranges from 10% in the Nordic countries to more than 25% in eastern European countries. Estimates of health impacts attributable to the exposure to PM2.5 has been made for the 2005 situation and for two sensitivity cases assuming that (i) the limit value is met everywhere and (ii) the exposure reduction target has been met by all countries. The exposure reduction approach results in a larger reduction in the burden of disease than meeting the limit values.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/03_PM2.5_AQEioneto9_FdLeeuw.pdf

PM trends in the Netherlands

Jan Matthijsen - Netherlands Environmental Assessment Agency (PBL)

ABSTRACT

Particulate matter is hazardous for human health. Health studies have shown that there is a significant association between both short-term and long-term exposure to, especially, fine particles and premature death. Other important effects include aggravation of respiratory and lung disease, asthma attacks, heart attacks and irregular heartbeat. European and national legislation has been developed to reduce the levels and effects of air pollution on human health and the environment.

Due to these measures decreasing levels are predicted. In The Netherlands but also in other European countries the trend in PM10 measurement data in the period 2000-2007 is not significant with respect to the uncertainty in this trend. This seems a contradiction with the calculated scenarios both for the same period but also for scenarios calculated for the near future. This possible contradiction is important since it might imply serious uncertainties in the knowledge and modeling of particulate matter. These uncertainties influence the ability to evaluate reduction policies and to assess the trend in future scenarios. The latter is essential for the plausibility of compliance with the targets.

At the 14th EIONET Workshop on Air Quality Assessment and Management, Warsaw 5-6 October 2009, results were presented of a PM10 trend analysis for the Netherlands. The analysis evaluated PM10 concentrations between 1993 and 2007 at regional background stations, by means of model calculations and measurements. Measurements show that PM10 concentrations decreased between 1993 and 2007 by 0.7 and 1.0 µg/m3 per year. The range indicates that the PM10 trend is very uncertain. The uncertainties are mainly due to meteorological fluctuations and due to instrumental changes in the national network. Measurements of other PM fractions at background stations, like black smoke and particulate heavy metals, confirm that a decrease during the nineties and a flattening of the trend since 2000 is the general pattern for trends in particulate matter.

A model assisted analysis was performed of PM10 concentration changes in the Netherlands between 1993 and 2007. It showed that about two thirds of the PM10 concentration changes could be linked to emission reductions over that period of sulphur dioxide, nitrogen oxides and ammonia. The other third appeared to be caused by reductions in primary PM10 emissions, volatile organic carbon emissions - through secondary organic aerosol - and particle bound water. These three contributions to the trend were about equal in size (about 10%). Particle bound water sticks to hydrophilic inorganic and organic particulate salts. As a consequence it magnifies trends in these salts. The trend magnification is estimated between 10 to 15%. We calculated that about one tenth of the PM10 concentration trend between 1993 and 2007 could be attributed to changes in the content of particle bound water. The analysis showed that the PM10 concentrations over the period 1993-2007 appeared to be in line, given the large uncertainties, with the relevant anthropogenic emission changes.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/04_PM_trends_NL_AQEioneto9_JMatthijsen.pdf

Discussion Session 1

Claudio Belis- JRC

There are several working groups working on the field blanks question of subtracting them or not. As concentrations have reduced, the filter blank has become more significant. Volatile compounds are also a problem.

Frank de Leeuw- ETC ACC

WHO commented that in some member countries PM2,5 concentrations are very high and such countries will need time to achieve considerable concentration reductions. WHO also commented that there is still a lot of ongoing discussions on how to quantify life years lost.

Jan Matthijsen- PBL

The Netherlands Research Program on Particulate Matter programme (BOP) measurements are more accurate because they used a High Volume Sampler (HVS), while the trend measurements were done with low volume samplers, with a higher inaccuracy. The BOP-data also agrees better with measurements in Germany and Belgium.

PM2.5 discussion session

The discussion was focused on the status of PM2.5 monitoring in regard to the CAFE Directive. Particularly, on the aim and status of the Average exposure indicator PM2.5 monitoring networks, as well as the status of the rural background stations for PM2.5 speciation measurements.

Presented discussion topics and questions

Exposure concentration obligation

- The aim of the **exposure concentration obligation** is to reduce harmful effects on human health.
- The obligation is a level fixed on the basis of the average exposure indicator. It has to be attained over a given period.

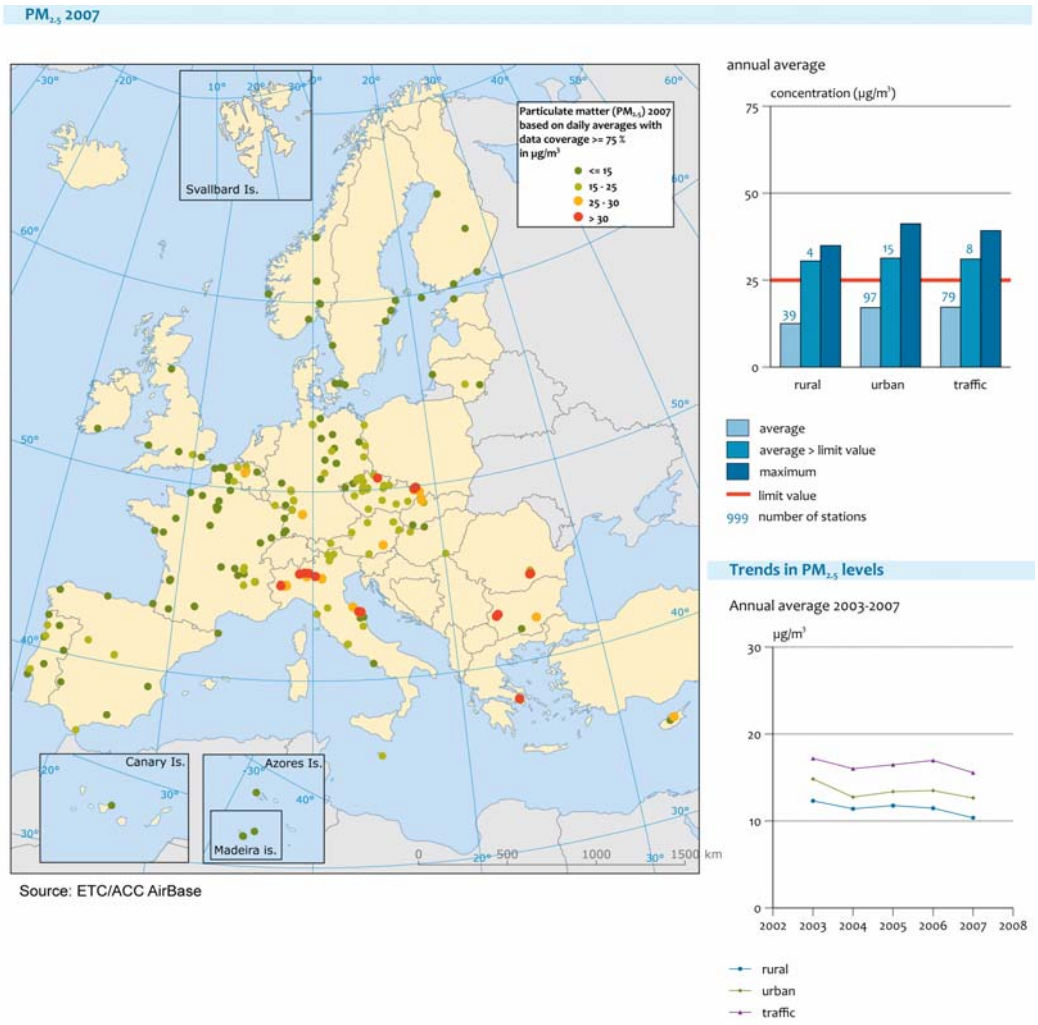
Average exposure indicator (AEI)

- The **average exposure indicator (AEI)**is an average PM2.5 pollution level, which reflects urban population exposure. It is determined on the basis of *measurements at urban background locations throughout the territory* of a Member State.
- It is used to calculate the:
- national exposure reduction target
- exposure concentration obligation

National exposure reduction target

The **national exposure reduction target** is the percentage reduction of the average exposure of the population of a Member State.
It is set for the reference year with the aim of reducing harmful effects on human health. It has to be attained –where possible –over a given period.

2007: PM2.5 reported from 87 urban background stations across Europe.



(Figure from ETC/ACC Technical Paper 2009/3)

Questions for the Session:

- What is your country's experience in defining the PM2,5 exposure indicator monitoring networks;
- What is the status of the implementation of the PM2,5 exposure indicator monitoring stations;
- Have you established more than the minimum number of stations, in case some stations have to move or change classification during to urban changes in the next 10 years?

- Problems encountered or predicted (ex. equivalence) and considered solutions
- First estimates of AEI (2008 level)?
- Indication of exposure reduction target (should be based on the 3-year running value in 2010 but first estimates might be available);

- Status of the rural background stations for PM2.5 speciation measurements
- *Comment in relation to PM2.5 speciation measurements at rural background stations:*
- Annex IV says explicitly that PM2.5 should also be measured at rural background stations (at least the total mass concentrations and concentrations of 'appropriate components'; on top of 'at least' number count measurements (e.g.) To characterize chemical composition (list of species is given). This links to EMEP (already available measurements)

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/05_AQ2009_PM2.5_S1discuss_AQEionet09.pdf

Discussion summary

- Some countries, as for example Austria, Spain and the Netherlands, have implemented more PM2.5 monitoring stations for the AEI than the minimum, in order to account for possible needs to:
  - move stations, change station classification during the next 10 years
  - reduce the uncertainty and climatic/topographic/etc. variability in the AEI calculation.

- Other countries, like Germany, have implemented the minimum number of stations imposed by the directive and are concerned about the difficulty of assuring a constant monitoring network over the future 10 years.

- Challenges concerning the calculation of the AEI reduction over 10 years:
  - inaccuracy of measurements (25% acceptable for daily averages, 10% for yearly mean);
  - how to discern emission-induced trends from effects due to meteorological variability, sea salt variability, etc

- First estimates of the AEI:
  - In the Netherlands and for 2008, the AEI was lower than expected and varied between 15 and 18 µg/m³.
  - Denmark: 2,5 stations: less than estimated based on model calculations (measured 14 µg/m³).
  - Austria: Large regional and meteorological variability. For example in Graz the AEI was 24 µg/m³ in 2006 and 28 µg/m³ in 2008; while in the north it was 16-18 µg/m³. There is a concern that the meteorological variability may be more significant for the AEI than implemented measured.
  - Bulgaria: Started in 2006 with the PM2,5 measurements, indicating very high PM levels.
  - Check republic: The are significant regional variations. The AEI in the north-eastern part of the country is higher than 25 µg/m³, it was 35 µg/m³ in 2008.

- Particularly in eastern European countries, where PM concentrations are partly very high, it appears unrealistic to aim at a reduction target of 25% reduction in 10 years. Many of those countries have not yet established a (stable) monitoring and/or clear mitigation plans.
- The PM2,5 speciation measurements in rural background stations have to be harmonised between the national authorities and the EMEP community. The European Commission expects to issue Guidance for implementation of PM2,5 speciation measurements on rural background stations in June 2010.

- WHO informed that they are interested in and working with research communities on PM1 to derive health effects and relative risk.
- WHO also informed on WHO-UNECE & EEA activities: Taskforce on health (meeting April 2009) Moldova, Albania Uzbekistan will start measuring PM10 & PM2.5.
- Due to economical pressure and high fuel prices, biomass burning is increasing, also in Western Europe, with the correspondent rise of concentrations.

SESSION 2 AIR QUALITY MODELLING

Session chair: Frank de Leeuw, ETC/ACC

Effectiveness of European Air Emission Reduction Measures

Jeroen Kuenen, TNO, the Netherlands

ABSTRACT

Jeroen Kuenen[1], Tinus Pulles[1], Mtinkheni Gondwe[1], Hans van der Brugh[1], Frank de Leeuw[2], Justin Goodwin[3]

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It is well known that hazardous air emissions can lead to serious health problems and damage to crops and ecosystems. The European Union attempts to tackle this problem by introducing air emission reduction measures. The majority of these measures have been taken in the two most important sectors: road transport and large industrial combustion.

This study presents an analysis of the effectiveness of the reduction measures between 1990 and 2005 for these two sectors, looking at emissions, air quality and impact on health and vegetation. The TNO Emission Assessment Model is used to perform emission calculations. The core structure of this model consist of a module that chooses a technology mix for each activity performed. This approach allows for changing technology penetrations over time.

For both sectors, except for the actual situation, two scenarios are studied: one where no policies would have been implemented, i.e. the 1990 technology distribution would have been constant throughout the study period; the other where all policies would have been implemented fully from their introduction date. The calculated emissions show that generally emissions have decreased significantly in both road

transport and large industries, however also areas are identified where emissions are not decreasing or even show an upward trend (e.g. NO_x from diesel combustion). Regarding air quality, significant improvements are found as a result of the reduction measures for particulates and acidification. For ozone, the situation is more complicated, since over a large area including Germany, the Benelux and parts of the UK the ozone concentrations are found to have increased. Consequently, the improved air quality leads to improvements with regard to effects of air pollution on human health and vegetation.

The reductions that occurred between 1990 and 2005 are significant, however a full implementation of the measures would have lead to a better situation, especially for Eastern European countries.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/06_PolEff_AEmissRedMeas_AQEionet09_JKuenen.pdf

AirWatch: Near real-time data for European-wide air quality indices

Stefan Jensen, EEA

ABSTRACT

Stefan Jensen
European Environment Agency (EEA), Denmark

Elements of the EEA Eye On Earth Airwatch application

COMMON AIR QUALITY INDEX

The EyeOnEarth site http://eyeonearth.eu provides daily air quality index values across Europe. This index is intended as an overview of air quality conditions in Europe and not a scientific reference. More detailed information can usually be found on national and local web sites. It reports the CAQI (Common Air Quality Index) that is calculated by combining NO2 (Nitrogen Dioxide), O3 (Ozone), and PM10 (particulate matter) into a single index valid for city background conditions as recommended by the CITEAR (Common Information to European Air) project. O3, NO2 and PM10 station readings are processed on an hourly basis. Please note a possible time lag of several hours due to technical reasons.

Common Air Quality Index (CAQI)

Very Good Good Moderate Bad Very Bad No Value

POLLUTANT BARS

High concentrations of the air pollutants PM, ozone and NO2 can lead to: 1) Short-term effects such as irritation of the eyes, nose and throat; inflammation of the airways, pneumonia; headaches, allergic reactions. 2) long-term effects (particularly concerning PM): chronic respiratory disease; lung cancer; heart disease; damage to the brain, nerves, liver, and kidneys.

concentration (µg/m³)

Pollutant	Very Good	Good	Medium	Bad	Very Bad
Partical Matter	Below 25	25-50	50-75	75-100	Above 100
Ozone	Below 60	60-120	120-180	180-230	Above 240
Nitrogen Dioxide	Below 50	50-100	100-200	200-400	Above 400

STATION DATA

Station data consists of recent in-situ measurements of concentrations of the key air pollutants ozone (O3), nitrogen dioxide (NO2) and particulate matter (PM10). It is hourly retrieved from EEA's data base. This data base currently covers more than 5000 European measuring stations from which ca. 1000 report routinely. A station utilises different measurement methods for each pollutant. For example, the local ozone concentration can be derived from measuring the strength of UV-light absorption by ozone molecules. In general measurements show hourly mean values. Though, these are reported almost immediately to EEA, there will be a time lag of at least one hour due to technical reasons. Comparing station readings to the air model map, one will frequently observe a difference between corresponding values. This is mainly due to the limited grid cell resolution of the underlying air quality model used to calculate the air quality model map. You can compare the discrepancy between model and station data by comparing a weather map to the weather station in your garden. While the current air quality models on the European scale utilize mesh sizes of 50 km, a station is representative for a single point only. Dependent on nearby polluters, e.g. traffic, and the wind direction it will capture the air pollution from 1m to several hundred meters distance from the station.

AIR MODEL / PUSH PINS

The model map shows the latest air quality forecast for most of Europe. Colours correspond to the so called Common Air Quality Index (CAQI) which takes into account the concentrations of ozone, nitrogen dioxide and particulate matter (PM10). See the AQI help file for more information. The model forecast is started daily during the early morning hours and is valid for 24 hours. The hourly results from the latest forecast are displayed. State-of-the-art air quality models take into account our current knowledge on air pollution using environmental information on weather conditions, available station readings and even satellite data. The model map currently utilizes the median of corresponding forecast values from three different regional air quality models (EURAD, CHIMERE, MOCAGE). See the providers tab for more information on contributing organisations or visit the PROMOTE project page:

http://wdc.dlr.de/data_products/projects/promote/IAQ/index.html

MORE INFORMATION

For more information: On air pollutants please visit the Air Quality page of the Directorate General for Environment of the Commission of the European Union or the EEA website and EEA Information Centre.
The model map shows the latest air quality forecast for most of Europe. Colours correspond to the so called Common Air Quality Index (CAQI) which takes into account the concentrations of ozone (O3), nitrogen dioxide (NO2) and particulate matter (PM10). See the CAQI help file for more information. The model forecast is started daily during the early morning hours and is valid for 24 hours. The hourly results from the latest forecast are displayed. State-of-the-art air quality models take into account our current knowledge on air pollution using environmental information on weather conditions, available station readings and even satellite data. The model map currently utilizes the median of corresponding forecast values from three different regional air quality models (EURAD, CHIMERE, MOCAGE). See the providers tab for more information on contributing organisations or visit the PROMOTE project page.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/07_Airwatch_NRT_AQEionet09_StJensen.pdf

Discussion Session 2

Effectiveness of European Air Emission Reduction Measures:

Especially concerning PM in Eastern European countries there is a lot to gain in implementing the full European reduction measures.

The results are very dependent on the horizontal resolution of the modelling. In Germany benefits are still expected to be attained from mitigation measures on industry, while this study does not show more improvement possible for Germany. Also it would be expected more benefits from measures on combustion plants in Eastern Europe than shown.

AirWatch: Near real-time data for European-wide air quality indices:

The LANDFACE project (7th framework) is also working on an operational frame for air quality information to the European public.

AirWatch is not producing regional indexes at the moment. Attention was drawn to the fact that PROMOTE/MACC is doing air quality forecasting for Europe and using assimilation techniques to combine modelling with measurements, but it can be difficult to combine both in a coherent manner. ETC/ACC has been working on the best method to combine modelling and measurements across Europe, in order to produce best air quality maps.

The quality of the near real time data (NRT) delivered to AirWatch, as well as the index calculation method were discussed, as they will influence on the result presented to the public. Further the fact that both MACC and EEA request member states to deliver directly NRT data, call for better harmonisation of requests for NRT data, so that one delivery from the member states can cover several needs.

SESSION 3
AIR QUALITY REPORTING RESULTS

Session chair: Cristina Guerreiro ETC/ACC

Summer 2009 ozone report – preliminary results

Libor Cernikovski - Czech Hydrometeorological Institute, CZ (ETC/ACC)

ABSTRACT

According to the Directive 2002/3/EC the Member States of the European Union have to provide:
- monthly data: before the end of the following month information on the exceedances of the information and alert thresholds (i. e. 1h maximal concentrations higher than 180 and 240 μg.m^{-3});
- April – September data: not later than 31st October information on the exceedances of long-term objective for the protection of human health (8h daily maximal concentrations higher than 120 μg.m^{-3} and 1h monthly maximal concentrations for all stations.

The data exchange is mandatory for the Member States, but other EEA's member and collaborating countries participate on voluntary basis, too. The detailed definition of the information to be reported can be downloaded from the Reportnet Data Dictionary (DD) http://dd.eionet.europa.eu.

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

In order to provide information on running summer ozone concentrations as timely as possible, the summaries of the monthly data provided by the countries are available on the website http://www.eea.europa.eu/maps/ozone/compare/summer-reporting-under-directive-2002-3-ec.

The presentation gives information on:
- legislation background,
- reporting procedure,
- QA/QC procedures made on delivered information,
- summary information on exceedances of 1h thresholds for period April-August 2009,
- information on comparison of the summer ozone reporting (SOR) and near real-time reporting (NRT).

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/08_SummerO3_2009_prelim_AQEionet09_LChernikovsky.pdf

Exchange of Information 2008 and 2009

Wim J.A. Mol - Netherlands Environmental Assessment Agency (PBL), ETC/ACC

ABSTRACT

According to the Directive 97/101/EC on the Exchange of Information (EoI) as amended by 2001/752/EC, the EU Member States have to provide yearly EoI Data on air quality. This data exchange is mandatory for the EU Member States, but other EEA Member and cooperating countries participate on voluntary basis, too.

The presentation gives information on the EoI2008 and EoI2009 reporting cycles, the feedback activities in 2009 and the developments in AirBase in 2010.

34 MS have delivered EoI2008 data and, after a very good feedback response, all data have been loaded in AirBase. Some additional AirBase actions have been taken place in 2009:

- 11 MS have station EoI codes derived from the station national codes feedback on a list with overlapping stations,
- overviews with historical time series gaps in AirBase have been generated and sent to the data suppliers with the request to deliver these historical data.

The status of the EoI2009 on 2 October 2009 is as follows: 29 MS have delivered EoI2009 (2008-data), 8 MS also delivered historical data in their EoI2009 submissions, 3 MS have promised to deliver historical data in October 2009 and 6 MS later this year or next year.

Further actions on AirBase and DEM in 2010 will be limited, because this is the last year of the ETC/ACC contract. The MS will be asked to perform as much as possible quality checks on the EoI2010 data by themselves before sending it to the EEA. Also EEA will request to deliver EoI2010 data earlier before 1 October 2010 so that AirBase will be completed as much as possible at the end of 2010. Therefore the next DEM will be released a month earlier on 1 May 2010.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/09_EoI2008_2009_AQEionet09_WMol.pdf

'Questionnaire' reporting results Data cycle: 2007

Edward Vixseboxse - Netherlands Environmental Assessment Agency, NL (ETC/ACC)

ABSTRACT

Member States are mandatory, under the Air Quality Framework Directive, to report yearly through the 'Questionnaire' on the air pollution and air quality measurements taken from stations in the zoning of their countries.

The 2007 reporting cycle is the third year that the Topic Centre Air and Climate Change (ETCACC) is executing the analysis and reporting the results.

This presentation will focus on the data quality and air quality results of the 2007 reporting cycle. Also any new aspects compared to the 2006 reporting cycle will be highlighted such as the results of voluntary reporting on the fourth DD pollutants by Member States.

EU27 zones in exceedance, 2007

EU27	2006	2007
O_3-V	27%	46.4%
O_3 H	39%	46.2%
PM_{10} day	45%	42%
NO_2 Yr	18%	23%
PM_{10} Yr	20%	17%
NO_x	3%	10%
NO_2 Hr	2%	3%
SO_2 Day	3%	2%
SO_2 Hr	2%	2%
Lead Yr	0.1%	0.6%
CO Yr	1%	1%
SO_2 Wntr	2%	0.3%
Benzene Yr	0.2%	0.3%
SO_2 Yr	1%	0%

Data quality improved in the 2007 data cycle. Voluntary information on zone area and population was supplied by Member States for almost all zones. The consistency in monitoring station coding between Questionnaire and EoI reporting is also improved to 98% (was 83%).

Concerning air quality in Europe in 2007 the most striking conclusions are: the number of zones in exceedance improved for PM10 somewhat (-3%) en worsened for O3 (+7%).

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/10_AQQ2007_AQEionet09_EVixseboxse.pdf

Discussion Session 3

NRT data delivery needs more re-submission of quality controlled or semi-QC data, as it clearly has poorer quality than the data submitted for the Summer ozone report. There should be some automatic QC on NRT data, on daily basis. The ETC/ACC has proposed criteria for such an automatic QC of NRT data.

SESSION 4
STATE OF THE ENVIRONMENT REPORTING

Session chair: Anke Lükewille, EEA

Overview of EEA's State of the Environment Report (SOER2010): Atmospheric Pollution and Urban Environment chapters, Part B

Anke Lükewille, European Environment Agency (EEA)

ABSTRACT

Anke Lükewille
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- Health impacts caused by exposure to certain pollutants such as sulphur dioxide (SO2) and lead have considerably improved over the last decades as a result of successful measures that have reduced emissions. However, other pollutants, in particular fine particulate matter and ground-level ozone still pose a considerable threat to the health of European citizens. According to the European Union's Clean Air for Europe Programme and the European Environment Agency hundred thousand people die prematurely each year because of poor air quality. The young, elderly, as well as people with pre-existing health problems such as asthma suffer more from the effects of short- and long-term exposure to air pollutants.
- European air pollutant levels still frequently exceed limit and target values set by the EU Air Quality Directive. Many Member States either have not or will not comply with legally binding limits, e.g. with the 2005 limit value for particulate matter or the 2010 limit value for nitrogen dioxide. For these two pollutants, many EU Member States have requested to delay the year by which limit values must be met, an option provided by the air quality directive. The European Commission accepts these extensions only if the Member States have adopted detailed air quality management plans that secure respecting the limit values by the new deadlines.
- Sensitive European rivers and lakes now show generally strong indications of less acidification. However, biological recovery in response to the reduced amount of acidifying pollutants, such as return of sensitive fish species, is lagging behind. Also reflecting reduced acidification inputs, the ability of Europe's forest soils to buffer acidifying pollutants has stopped declining, but here general improvements are not yet seen. Excess nitrogen deposition, now the principal component of

acidification following the past reductions in sulphur emissions, contributes considerably to the problem of nutrient oversupply in terrestrial, coastal, and marine ecosystems, leading to eutrophication.

- Reflecting the lower emissions of SO2, areas subject to excess acidification from air pollution will have decreased by more than 80 % by 2010 compared to 1990. In contrast, the magnitude of eutrophication has diminished only slightly over the years. Outlooks for 2020 indicate that there remains a widespread risk of excess eutrophication in Europe's environment. This conflicts with the EU's long-term objective of not exceeding critical loads of airborne eutrophying substances in sensitive ecosystem areas. Similarly, most vegetation and agricultural crops are still exposed to ground level ozone levels that exceed the long-term objective given in the Air Quality Directive, set to limit crops losses due to ozone exposure.
- Despite much progress in reducing SO2 and emissions of other air pollutant emissions over the past decades, only 14 European countries anticipate they will meet all four pollutant-specific emission ceilings set under EU and international legislation. This implies that European levels of air pollutant emissions persist above the levels needed to reach the interim targets and objectives set in the Air Quality Directive for the protection of human health and the environment.
- At a hemispheric/global scale, reducing emissions of short-lived pollutants such as ozone precursor methane and black carbon particulate matter will lead to direct benefits for both climate change and human health.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/11_AP_SOER_B_AQEioneto9_ALuekewille.pdf

Poland's presentation related to SOER Part C

Magdalena Brodowska, Chief Inspectorate of Environmental Protection, Poland

SOER 2010 Part C – Air Quality In Poland

ABSTRACT

In Poland air quality data are obtained in the framework of the State Environmental Monitoring by the Inspection of Environmental Protection – the Chief Inspectorate of Environmental Protection and Voivodship (regional) Inspectorates of Environmental Protection (or by contracted bodies such as research institutes).

Despite constant air quality improvement in Poland the problem remains in respect to particulate matter in winter season and tropospheric ozone in summer.

Ozone concentration trends over the last twelve years at three regional background EMEP stations show slight decrease (southern station located in mountains (PL03) reports minimal upward trend). Episodes of exceedances of ozone target values occur in summer. They are connected with transboundary ozone precursors and ozone from

southern and southwestern Europe. Rare episodes of exceedances of information threshold result from noticeable contribution of local emission sources.

In Poland in period 2004-2007 exceedances of PM10 annual limit value, based on measurements, were observed at two agglomerations. More exceedances were observed in terms of daily PM10 limit value.

Based on model calculations in central part of Poland majority of PM10 comes from local sources, high contribution of transboundary PM10 is observed at Polish borders. Higher ratio of PM2.5/PM10 is observed in eastern and northeastern parts of Poland. Source apportionment exercises as well as modelling results show that the majority of PM10 comes from combustion sources in particular individual household sources (crude coal combustion). Second major source of PM is the road transport.

In few urban locations high concentrations of nitrogen dioxide occur. Concentrations of other pollutants such as sulphur dioxide, carbon monoxide, benzene or heavy metals in PM10 seem to be no longer a threat.

Despite significant economic growth, during the last decade Poland has lowered emissions of SO2, NOX and NH3. It resulted in decoupling the trend of Polish GDP from the emissions over ten-year period 1998-2007. In spite of increasing number of cars (6.5 mln more in the last decade) in 1998-2007 Poland has not experienced an increase in emissions of NOX. Emissions of SO2, NOX and NH3 with respect to Polish emission ceilings as defined in the Accession Treaty have visible downward trends (the most significant trend of emission decrease is observed for SO2).

Several mitigation measures, compliant with the EU acquis communautaire, are expected to bring air pollution decrease: permits for emissions to air, integrated permits, emission standards, fuel standards, EURO standards, increase in the use of renewable energy resources and less energy-demanding economy, investments in transport – especially rail, implementation of air quality protection programmes.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/12_SOER_C_PL_AQEionet09_MBrodowska.pdf

Norway's presentation related to SOER Part C

Ingrid Strømme - The Norwegian Pollution Control Authority, Norway

Exposure calculations of PM10 and PM2,5 for Norway

ABSTRACT

In Norway, particulate matter (PM10 and PM2,5) and nitrogen dioxide are the most important components of local air pollution. Road traffic is the dominant source of air pollution. Road wear and continuously circulating road dust is the main source for coarser particles (particles >2,5 and <10 µm, PM10) in Norway, while combustion from mobile sources and stationary sources such as domestic wood burning in stoves are the main sources for finer particles (<2,5 µm, PM2,5). The annual mean levels for PM2,5 lie about 10-12 µg/m3 in the largest cities.

Exposure calculations modelled in AirQUIS demonstrate that the levels of PM (PM10 and PM2,5) in Oslo will be reduced substantially by 2020. This is mainly due to large reduction in exhaust emission from vehicles and domestic wood burning caused by a change to cleaner ovens. Modelling results shows that in 2020 only 8% of the population in Oslo will be exposed to levels up to 10µg/m3.

Evaluation of abatement measures demonstrates that an increase in non-studded winter tyres will have a large effect on the concentration levels of PM10. This abatement measure will also have an effect of PM2,5. Installation of "end of pipe" electrostatic precipitation and oxidation device for household will have a lower effect of reducing PM2,5.

However, evaluation of the model predicted concentration against local air measurement shows that the model somewhat underestimate the concentration levels. This might be due to difficulties in modelling suspension of road particles.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/13_SOER_C_NO_AQEionet09_PM10PM2.5_IStromme.pdf

Austria's presentation related to SOER Part C

Wolfgang Spangl - Umweltbundesamt Austria, Dept. for Air Quality and Energy

State of Environment Report Part C – Air Quality in Austria

ABSTRACT

Limit and target values as well as information and alert thresholds for PM10, NO2 and Ozone are exceeded in large parts of Austria in the last decade. High emissions in urban areas, transboundary (long-range) transport in the extra-alpine regions, and adverse dispersion conditions in Alpine valleys and basins as well as south-east of the Alps are the major factors for PM10 LV exceedances.

There are strong inter-annual variations in PM10 levels due to meteorological conditions, the situation in winter being a key factor for LV exceedances. 2003 was affected by frequent transport of air masses from eastern Europe, 2006 by frequent low wind speed situations. 2007, 2008 – and very likely 2009 – show low PM10 levels due to more frequent advection of oceanic air masses.

NO2 limit value exceedances occur at traffic sites, both urban and near motorways. Despite decreasing NOx levels, NO2 concentrations have increase at traffic sites in recent years due to a distinct increase of primary NO2 emissions from Diesel cars with oxidation catalysts.

Ozone target values are exceeded throughout Austria. Except in the region around Vienna, where regional photochemical ozone formation plays a significant role, the observed ozone levels reflect a large-scale background and transport.

There is no clear trend to be observed, but strong inter-annual variations, 2003 being the highest polluted year. 2009 will be very likely the least polluted one since monitoring started two decades ago.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/14_SOER_C_AT_AQEioneto9_WSpangl.pdf

Germany's presentation related to SOER Part C

Arno Graff - Umweltbundesamt Germany

Some Aspects on Air Quality in Germany related to SOER

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ABSTRACT

We have reported on "AIR QUALITY TRENDS IN GERMANY - PM10, NO2 AND OZONE 1995-2007" in Germany during 13th EIONET meeting in Bruges. The contribution to the 14th EIONET meeting now was the presentation of a deeper analysis of German air quality data.

For evaluating annual mean trends of nitrogen dioxide, PM10 and ozone concentrations data from a dense, but spatiotemporally inhomogeneous monitoring network are used. As this inhomogeneity may influence the evaluation of trends, data originating from continuously measuring stations and all available stations are compared within three characteristic pollution regimes (urban-near traffic, urban background and rural background). As a result, urban-near traffic annual mean time series should only be evaluated by using data from continuously measuring stations.

Considering the air quality, the mean NO2 time series within the category urban-near traffic showed no significant trend, PM10 showed a significantly falling trend, ozone a significantly rising trend. Within urban background PM10 and NO2 concentrations decreased significantly, ozone concentrations increased. Rural background measurements show a falling NO2 trend, PM10 and ozone concentrations show no trend at all.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

Discussion, first part of Session 4

The 2008's reduction in PM10 exceedances in Germany is mostly due to meteorological conditions. Even if emission reductions have contributed to improved AQ levels, it's influence is less significant than the meteorological influence. Higher NOx emissions and higher NO2/NO ratio may be the reasons for increased O3 measured at traffic stations. Never-the-less, past O3 exceedances, have not been so significant lately. Since 2000 there has been a decrease of ozone peak values, but an increase in ozone mean values.

Unclear if member states have taken into account the 2020 targets on their SOER outlook reports. It would be interesting to see the consequences of the renewable energy plans have on air quality and to analyze air quality measures efficiency per sector.

It would also be interesting to check the links between MS SOER reporting and the AQ monitoring /questionnaire reporting. EEA will send the SOER first draft to the MS for comments in the middle of October.

Inputs from the PROMOTE / MACC projects - GMES Atmosphere Services

Laurence Rouil - INERIS Institut National de l'Environnement Industriel et des Risques, France

ABSTRACT

Reinforced modelling capacities are nowadays developed in the field of air quality, by the member states to improve their own AQ monitoring strategies, and within the framework of the GMES projects related to Atmospheric services (PROMOTE, GEMS, MACC). On the other side, near real time (NRT) observation data become available for the whole air quality community thanks to gather and exchange experiments similar to the "OzoneWeb" project led by the EEA, or to agreements established under the GMES umbrella.
Combining both model results and NRT observations, using data assimilation techniques, allows to establish sophisticated air quality maps where:

1) the model error, compare to measurements, is minimum at the monitoring station locations;
2) the spatial distribution of concentration fields is well described by the models.

This approach results in the so-called "analysed maps" which are powerful tools for understanding the development of air pollution episodes, and raising awareness of the general public and policy makers.
The future GMES atmospheric services aim at promoting and disseminating such products. How they can be elaborated, evaluated and distributed is discussed in the presentation.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

Discussion, second part of Session 4

The MACC produces a NRT analysis of AQ in Europe, based on NRT data and modeling. It may be used to analyze episodes, for the reporting to the EC on exceedances. It is a complementary approach to the ETC/ACC AQ mapping, which is not in NRT.

It is difficult to treat the differences in PM measurements across Europe, due to inconsistent or different use of correction factors across countries.

The GMES core services are not focused on cities, but doing the modeling on regional scales using 50 or 25 km resolution, depending on the resolution of boundary conditions and meteorological data. The resolution is planned to be improved in the future, especially when the ECWMF will provide their meteo data and boundary conditions on 25 km resolution. The resolution of reported emissions is another limiting factor, and there are initiatives to improve the emission resolution at European scale. By 2012 an improved modeling system, with a resolution down to 10 km, is expected. Modeling on finer resolution over urban areas will be done by downstream activities, done by national/local experts. But it is necessary to work together to couple the systems in order to get down to a better resolution on the cities level. There is a project on this called PASODOBLE.

The 6 models used by MACC for the ensemble modelling have been selected based on intercomparison exercices and operational skills. MACC considers that the used models are state of the art. There are dedicated teams working on model improvements. The development foreseen is dedicated to the assimilation techniques.

Airwatch uses the services provided by PROMOTE/MACC.

SESSION 5
AIR QUALITY INDICATORS AND INDICES

Session chair: Peder Gabrielsen, EEA

Discussion paper on air quality indicators

Frank de Leeuw – Netherlands Environmental Assessment Agency (PBL), ETC/ACC

Indicators on Urban Air Quality - A review of current methodologies

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ABSTRACT

Various international bodies (EC, EEA, Eurostat, WHO) use different sets of indicators to follow the development of the air quality in European urban areas. In this presentation we discuss three main indicators at the European level (Structural Indicator, Urban Audit indicators and the Core Set of Indicators): similarities and differences in objectives, in methodologies and in assumptions for calculation of indicator value and the differences in input data will be discussed.

Recommendations on streamlining the input requirements of the indicators and on the presentation of the indicators will be given. Possible extension of the indicator with PM2.5-results is discussed.

Following the DPSIR-chain the current indicators are typical state indicators: ambient concentration levels are presented. Options to develop an impact indicator, that is, giving information on the health impact attributable to air pollution will be discussed.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

Status FAIRMODE guidance document, use of AQ modelling under AQ directive

Bruce Denby – Norwegian Institute for Air Research (NILU), ETC/ACC

ABSTRACT

A modelling guidance document is currently under development as part of the activities of FAIRMODE (The forum for air quality modeling in Europe, http://fairmode.ew.eea.europa.eu/). This document, entitled 'Guidance on the use of models for the European air quality directive' is intended as a focal point for modeling activities related to the European air quality directive and provides descriptions, interpretations, links, references and good practice examples for air quality modelling.

The document will be finalized by the end of 2009 and is currently in its second draft form. The presentation is intended to inform, encourage participation in the documents development and to promote its use within the air quality community.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/18_FAIRMODE_AQEionet2009_BDenby.pdf

Discussion Session 5

WHO suggested that here should be an indicator accessing effectiveness of mitigation measures, as indicators should be a mean for policy makers to check the quality and effectiveness of their policies. There is a currently running project, PRONET, covering 25 MS to Municipality level, identifying and accessing pollution reduction measures. The information generated by this project should be linked to Airbase data and should provide advice to countries and policy makers.EEA and/or ETC-ACC is invited to participate in the 'Pronet' workshop in Brussels (3 November 2009).

ETC/ACC and EEA will have a workshop with stakeholders to discuss AQ indicators in 2010. In addition to the necessary AQ indicators, ETC/ACC proposes to consider effect indicators, like on health, and eventually also a "response indicator", as suggested by WHO.

Quality assurance of models is not part of the Modelling Guidance Document. The FAIRMODE activities under working group 2 (lead by JRC) are leading the discussion on quality assurance and fitness for purpose of models used by the MS for AQ management.

SESSION 6A
AIR QUALITY DIRECTIVE AND DATA FLOWS

Session chair: Anke Lükewille, EEA

Update on the Directive on Ambient Air Quality and Cleaner Air for Europe, status of the implementation

Alessandro Bertello– European Commission, DG-ENV

ABSTRACT

The new **Directive 2008/50/EC**[1] of the European Parliament and of the Council of 21 May 2008 on Ambient Air Quality and Cleaner Air for Europe (AQD) entered into force on 11 June 2008. It merges and streamlines existing legislation with the exception of Directive 2004/10/EC (the 4th daughter directive); clarifies treatment of contribution from natural sources, sets new air quality objectives and associated assessment requirements for $PM_{2.5}$ (fine particles) and provides, under conditions, more time to comply with PM_{10}, NO_2 and benzene limit values (time extension).

Time extension exercise is now being implemented, in order to provide some indications of the complexity and on the dimension of the process some data related to PM10 requests for derogation are reported below:

- 329 zones in 23 Member States were in exceedance in 2007 for the PM10 daily
- Ireland, Finland and Luxemburg complied with the LV
- Lithuania was in compliance with the PM10 daily LV after deduction of contribution from resuspension after winter sanding/salting of roads (Article 21 of Directive 2008/50/EC, Article 5(5) of Directive 1999/30/EC)
- 18 MS notified to date for 308 zones, it should be noted that a notification may not include all the zones in exceedance in a Member State, several notifications was received from Germany, Spain and Italy – hence more than one decision will be taken for these MS). The Netherlands was first to notify – July 2008
- Estonia, Malta, Romania, Slovenia and Sweden have not notified
- Decisions have been taken for 13 MS to date (NL, AT, BE, DE, DK, EL, ES, FR, HU, SK CZ, LV, IT)
- Further decisions are going to be taken in autumn, up to January 2009 (PT, DE, ES, PL, UK, BG, CY, IT)
- To date only two MS submitted a notification for a postponement of the NO2 LV (NL, HU).

The Commission, supported by external consultants (a consortium between UBA Austria and AEA Technologies), assessed for each zone the fulfilment of the following 3 conditions set by the new air quality directive:

- All appropriate measures have been taken at national, regional and local level to achieve compliance by the initial attainment date, i.e. 2005 or 2010

1 OJ L 152, 11.6.2008, p.1

- For PM10 there should be causality between exceedances and the occurrence of one or more of the following factors: Site specific dispersion characteristics, Adverse climatic conditions, Transboundary contributions
- Compliance with the limit values will be achieved by the new deadline, i.e. June 2011 for PM10 and 1 January 2015 at the latest for NO2 or benzene.

Precise criteria have been set for each condition in order to carry out reproducible assessments and to insure equal treatment between the different notifications.

Where the assessment shows that the conditions are satisfied the exemption will apply until June 2011. It should be noted that exemptions will apply to the air quality zones as it was assessed – this means that the area covered by the exemption corresponds to the zone as it was defined in the reference year indicated in the notification and specified in the Decision. If the zone, for instance, has been merged with other zones in subsequent years it does not mean that those zones will benefit from the exemption as well. Hence the reporting during the exemption period will have to be maintained for the "reference year zone".

The Commission expects that in the exempt zones, the measures indicated in the Forms and the air quality plans are implemented and that there is an appropriate follow-up of the implementation of the Air Quality plans during the exemption period. The Commission will follow closely that LV + margin of tolerance is not exceeded in the exemption period.

In the decisions objections are raised in respect of several zones on the following grounds:
- Information is missing for a full assessment
- The information was sufficient and a full assessment was possible, however one or several conditions have not been satisfied
- Compliance with limit values already achieved – an exemption is only granted if there is a need for more time to achieve compliance. A derogation is nott a permission to pollute or to increase concentration levels

On the basis of the above criteria this is the summary of the 13 decisions taken until now

No objection:
- 25 zones are exempt from applying the daily PM10 limit value (NL, AT, DE, HU, IT, CZ).
- 4 zones are exempt from applying the annual PM10 limit value but not the daily (HU, IT).

Objections raised in respect of AT, BE, DK, EL, ES, FR, HU, SK, IT, CZ, LV as follows:
- 1st condition: 35 zones because the condition is not satisfied in 7 zones, and not sufficiently substantiated in 28 zones;
- 2nd condition: 57 zones because the condition is not satisfied in 4 zones, and not sufficiently substantiated in 53 zones;
- 3rd condition: 126 zones because the condition is not satisfied in 4 zones, and not sufficiently substantiated in 122 zones

Compliance has been achieved in 46 zones:
- 29 zones comply with the annual limit value
- 17 zones comply with the daily limit value

The time extension exercise and in particular the big number of objections raised on the 3rd condition have shown that in many Member States there are weak points in the air quality management, in particular as regards the estimation of the impact of

abatement measures and the related projection of air quality levels. There is now an increasing awareness of the need to take action and in particular to improve the tools used for air quality management and planning.

New and updated air quality plans are also being adopted at different levels of governance and the general impression is that the quality of the plans has improved significantly compared to those communicated to the Commission in previous years. Other implementation issues of directive 2008/50/EC are following the scheduled agenda.

Draft guidelines for:

- demonstration and subtraction of exceedances attributable to natural sources - Art 20 (3)
- determination of contributions from the re-suspension of particulate following winter –sanding or -salting or roads Art 21(5)
- agreements on setting up common measuring stations for PM2.5 measurement at rural background station Art 6(5)

have been submitted for comment and reviewing to the working group for implementation under the air quality committee.

A Guidance document on the demonstration of equivalence is already published on the Commission website at the following address:
http://ec.europa.eu/environment/air/quality/legislation/assessment.htm

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/19_nAQD_CAFE_status_AQEionet09_ABertello.pdf

Discussion Session 6A

PM10 limit values attainment in 2011 means that the annual average LV of 40 µg/m^3 must not be exceeded in 2011 and the daily average LV of 50 µg/m^3 must not be exceeded from June 2011.

The Netherlands have been granted attainment time extension and should have been included in the list of countries.

It may be difficult to evaluate the accuracy of the MS estimates in their requests for time extensions. The EC expects in this respect guidance and information on the definition of model accuracy from FAIRMODE. In terms of evaluating the effect of the mitigation measures, the EC would like to see more source apportionment studies done by the MS, in order to have a better understanding of the sources of the problem and therefore a better mitigation strategy, where the impact of measures is better known. On the other hand, source apportionment is quite expensive and it is therefore not easy to have indicators on the effectiveness of measures.

SESSION 6B
AIR QUALITY DIRECTIVE AND DATA FLOWS

Session chair: Tim Haigh, EEA

CAFE/SEIS/INSPIRE project overview

Jean Dusart - European Commission, Joint Research Centre
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ABSTRACT

As technical coordinator of the INSPIRE Directive, the JRC has launched last year a tender procedure for linking the current and future legal reporting obligations under the CAFE Directive with the INSPIRE Directive requirements. The objectives of the project are the deployment of pilot data services, exposing the potential deficiencies of the current reporting mechanisms and looking for common solutions through the renovation of current practises on air quality information management. The results should provide feedback to the Commission services, the Data Exchange Group, the European Environment Agency and the Member States taking into account experiences from different geographic areas (four countries) and levels of governance (centralised and decentralised). The presentation will set the context and present the first results of the project that should be completed by the end of 2009.

Concluding sentences
The project "Development and demonstration of technical IT solutions for data exchange and reporting under the CAFÉ Directive using INSPIRE services" should contribute to the finalisation of the Implementing Provisions, based on the deployment of workable test cases (prototypes) covering different geographic areas and levels of governance. The results should help highlighting potential deficiencies in the current reporting mechanisms and propose common solutions in close cooperation with the main actors of the air quality information collection (LMOs, Legally Mandated Organisations). The expected project calendar fits well with the CAFÉ Roadmap (transposition deadline 11 June 2010) and the INSPIRE Annex III data specifications work (starting early 2010) on environmental monitoring facilities.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/20_CAFE-SEIS-INSPIRE_reporting_AQEioneto9_JDusart.pdf

Cooperation of EMEP/CCC and EEA on near real-time (NRT) data

Wenche Aas - Norwegian Institute for Air Research (NILU), Norway
Chemical Co-ordinating Centre of EMEP (EMEP/CCC)

ABSTRACT

To clarify the different needs for near real time air quality (NRT AQ) data and provide recommendations on a strategy on data sharing and exchange, EEA and EMEP have carried out a feasibility study. There are clear differences in the needs. While EEA needs NRT data to inform the public and to support the EU policy cycle for air quality legislation, EMEP needs NRT AQ to improve the understanding of atmospheric processes, impacts of air pollution and their links to climate. There are some overlap in only a few parameters and sites, and for these it is necessary to ensure that duplication is avoided by re-using capacities and data.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

NRT data needs from the pre-operational GMES Atmospheric Core Service

Leonor Tarrasón - Norwegian Institute for Air Research (NILU), ETC/ACC

ABSTRACT

NRT data in the pre-operation GMES Atmospheric Service

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GMES is an EU initiative that stands for Global Monitoring for Environment and Security. It combines space-based satellite information with ground based in-situ observations in an Earth observation system that allows the collection of information about the planet's physical, chemical and biological systems and involves monitoring of the natural environment. The GMES initiative comprises a series of services aimed at monitoring land, ocean and atmosphere, and addresses also emergency and security. The EEA has been appointed as the in-situ data coordinator under GMES and EEAs contribution is essential to the operational GMES services.

This talk presents the need for near real time (NRT) in-situ observation data under the pilot GMES Atmospheric Service (MACC) and how the work under the project links to the on-going work of the EIONET community and the EEA.

The work under the pilot GMES Atmospheric Service is highly dependent on the availability of timely good quality air quality in-situ data. The MACC (Monitoring Atmospheric Composition and Climate) project needs NRT data to forecast environmental emergency situations and to facilitate environmental risk

management. In first instance, NRT air quality data are needed in MACC to improve the air quality forecasts through data assimilation, although NRT AQ in-situ data is also useful for calibration and validation of satellite information. The requirements for NRT data in the GMES Atmospheric Service go beyond some of the existing standards, in particular with respect to the requested atmospheric components, the timeliness of the data, the metadata description and the formats of data exchange.

The support of the EEA and the EIONET community to the GMES Atmospheric Service will be essential to guarantee adequate access to NRT in-situ data in the requested GMES standard. In return, it is expected that the products from the GMES Atmospheric Service will be useful to the EIONET community. The MACC project offers the possibility to provide regular feedback on the quality of the in-situ air quality observations, common validation means through an ensemble of models and regular overviews of the state of air pollution in Europe. In addition, the pilot service is intended to support to National Environmental Agencies in designing and testing control strategies to limit environmental risk situations.
Co-operation between MACC, EEA and the EINOET community will be most useful to identify the relevant available NRT AQ data and to establish the adequate timeliness standards. It is also envisaged that such cooperation will stimulate an open dialog on metadata standards and flagging systems and will facilitate a common evaluation of feasibility of different data exchange systems under SEIS. The long-term sustainability of the access to NRT data and atmospheric service products relies on a successful cooperation between the GMES Atmospheric Service and the EEA.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/22_NRTinGMES_AQEionet09_LTarrason.pdf

Update on EEA's near real-time data work: ozone, NO2, PM10

Peder Gabrielsen - EEA

ABSTRACT

EEA work on near real-time data takes place in the context of EEA's coordination role in SEIS[2] and GMES in-situ coordination[3]. Initially, EEA's near-real time (NRT) air quality (AQ) data flow was sketched-out and usage of the data was explained more in details. The overall three categories for NRT AQ data usage are:

- Display at 'EEA Ozone web' (http://www.eea.europa.eu/maps/ozone/map) and 'Eye on Earth AirWatch' (http://www.eyeonearth.eu) application,
- Summer Ozone Reporting (SOR), and
- NRT AQ data re-use for various research and GMES projects.

Three European different maps were presented in order to provide the current geographical overview in terms of O_3, PM_{10} and NO_2 data coverage. Approximately

[2] Shared environmental information system (SEIS)

[3] Global Monitoring for Environment and Security (GMES): we care for a safer planet; COM(2008) 748 final (http://ec.europa.eu/gmes/pdf/COM_2008_0748_en_communication.pdf)

900 AQ monitoring stations provide NRT O_3 data. For PM_{10} and NO_2 the number is around 800 stations (October 2009).

As of autumn 2009 EEA is increasing its efforts in the consolidation of NRT AQ data exchange with Eionet countries. With the support of the European Topic Centre on Air and Climate Change (ETC/ACC), the consolidation phase is focusing on:

- Re-transmission of NRT AQ data,
- Full coverage of ozone data provision,
- Generating the Summer Ozone Report (SOR) from NRT ozone,
- Extending NRT from ozone to NO_2, NO_x, PM_{10}, $PM_{2.5}$, SO_2 and other parameters.

EEA informed that in order to ensure that the data held at the EEA matches national databases, re-transmitting mechanisms have been put in place. Hence, the focus is on encouraging countries to **automatically re-transmit data to EEA after national data validation procedures are applied** so that the European database matches what is in national/regional databases. A reference regarding re-transmission was made to relevant CIRCA NRT interest group under

'Near real-time AQ EEA QMS operational procedures' (http://eea.eionet.europa.eu/Public/irc/eionet-circle/airclimate/library?l=/public/real-time_operational&vm=detailed&sb=Title) (document 'P7141e Using NRT ozone data for summer ozone reporting' (http://eea.eionet.europa.eu/Public/irc/eionet-circle/airclimate/library?l=/public/real-time_operational/real-time_maintenance/p7141e_reporting/_EN_0.4_&a=d)).

EEA explained that **in relation to O_3 data, the consolidation also focus on increasing the coverage** for the few remaining countries where provision of NRT AQ data provision is insufficient. In addition there are also stations in several countries, which are included in the reporting of monthly and summer exceedances but they are not reporting NRT O_3. EEA informed that ETC/ACC would be contacting NRT data providers so that the actions to include these stations in the NRT system will be in place as soon as possible.

Full implementation of re-transmission and a full coverage of stations will ensure that **Europe's Summer Ozone Report (SOR) can be successfully based on NRT O_3 provision.** The feasibility has already been demonstrated in the pilot projects which ran in 2007 and 2008. EEA was looking at the situation for 2009 and saw for some countries, that the current overview of exceedances shown by the NRT (http://www.eea.europa.eu/maps/ozone/compare/explorer) did not match the overview of monthly exceedances reported in CDR (http://www.eea.europa.eu/maps/ozone/compare/summer-reporting-under-directive-2002-3-ec#overview-of-monthly-deliveries). Countries were encouraged to take a look at their values and re-transmit the NRT data if necessary.

EEA informed that the EEA NRT system can receive data for other pollutants in addition to O_3. With the current demand on in-situ NRT AQ data across different EU projects, the **EEA is focusing especially on including NRT data for NO_2, NO_x, PM_{10}, $PM_{2.5}$ and SO_2.** A number of data providers are already providing additional pollutants. EEA mentioned that ETC/ACC would be contacting data providers to support this process.

EEA thanked the Eionet AQ community and particularly the NRT data providers for their valuable support to EEA. The Eionet workshop participants were encouraged to contact EEA or the ETC/ACC if there was any need for support or questions of clarifications.

EEA expressed that it looks forward to continuing the cooperation on NRT AQ data work in the coming years.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/meeting091005.html

Summary and Discussion Session 6B

EEA outlined the plans communicated to countries as per letter of 8 September 2009 in relation to NRT data exchange. The provision of near real-time air quality data and the data exchange with Eionet countries should be consolidated, in order to better support the many foreseen uses (Ozone web, AirWatch and GMES services). Countries recognised the need to apply SEIS principles (in particular request once, and re-use) and also the added value of one European repository for NRT data access to prevent repeated demands for the same data in different format and standards.

There was general consensus that EEA should ensure that EU research and GMES projects were able to access the NRT data and should make use of it. EEA noted this and agreed with the comments raised by countries and confirmed that part of the thinking behind the recent formalisation of the request to the Eionet community to extend NRT data submission from ozone to NO_2,NO_x, PM_{10}, $PM_{2.5}$, SO_2 and other parameters, as well as to re-transmit NRT AQ data, after initial quality controls, was to ensure consistency between national/regional and EEA databases and allow for this wider re-use. This would for instance allow use of NRT O_3 data, after validation, for the Summer Ozone Reporting in support of the policy cycle, whilst excluding the use for compliance reporting. EEA also noted that in its role as coordinator of in-situ for GMES, it would take more of a leading role in ensuring sustainable provision of in-situ data in support of GMES services. Data suppliers were also asked to provide the gravimetric equivalent (correction factor) for their PM_{10} and $PM_{2.5}$ measurements, as well as an update on the correct NRT contact details, where necessary.

EEA and the ETC/ACC have developed help tools, support information and operational support for the NRT data providers. MS should consult the detailed recommendations described in QMS P7141a in Eionet CIRCA NRT AQ section.

EEA and EMEP have worked during the course of 2009 to streamline NRT data provision and flow and avoid duplication of efforts, particularly in relation to the new EMEP monitoring strategy which outlines objectives in relation to NRT data. During the course of the work, it had become apparent that EEA and EMEP have different objectives and different requirements for NRT data.

It was also recognised that the needs of NRT data from the GMES Atmospheric Service are more extensive than existing standards at the EEA. It is necessary that EEA, the Eionet NRT network, EMEP and the GMES Atmospheric Services cooperate in the establishment of flexible standards for NRT data exchange and metadata description. In particular, they should refine the description of requirements on timeliness and agree on common standards for metadata description and flagging systems . It is also envisaged that cooperation between

EEA, the Eionet NRT network, EMEP and the GMES Atmospheric Services will facilitate a common evaluation of feasibility of different data exchange systems under SEIS and this should be linked to INSPIRE processes and standards.

Conclusions from the discussion:

- JRC proposed the creation of a structure or body to cooperate on how to ensure data quality at all levels before delivering to end users.

- The MS wish to submit (and re-submit QC) NRT data only once. In order to achieve this and still cover the needs of all the actors and projects presently requesting delivery of NRT data from the MS, it is necessary to have coordination between the different actors and produce clear requirements for the NRT data submission.

CONCLUDING REMARKS AND CLOSING DISCUSSION

Anke Lükewille summarised the PM2.5 discussion session and informed that the workshop summary and conclusions would be elaborated after the workshop and would be available at the workshop web site, as well as sent to the participants for comments.

Link to presentation: http://air-climate.eionet.europa.eu/docs/meetings/091005_14th_eionet_aq_ws/05a_ConclusionsS1_PM2.5_AQEionet09.pdf

ANNEX 1 WORKSHOP AGENDA

14th EIONET Workshop on
Air Quality Assessment and Management

Warsaw, Poland, 5th and 6th October 2009

At the Hotel Novotel Warszawa Centrum, Marszalkowska 94/98

Monday 05 October

08:00-09:00	**Registration**	Catherine Brytygier (EEA)
09:00-09:15	Welcome address by the host	Lucyna Dygas Ciołkowska (Director of the Department of Monitoring and Environmental Information)
09:15-09:30	Welcome, scope and goal of the workshop	Aphrodite Mourelatou (EEA, Head of the Air Quality and Noise Group)
Session 1: Particulate Matter with special focus on $PM_{2.5}$ (chair: Sheila Cryan, EEA)		
09:30-10:00	Results of a quality assurance programme for $PM_{2.5}$/PM_{10} carried out by JRC between 2006 and 2009	Claudio Belis (JRC Ispra)
10:00-10:20	$PM_{2.5}$ health impact assessment based on interpolated maps	Frank de Leeuw (ETC/ACC, PBL)
10:20-10:40	PM trends in the Netherlands	Jan Matthijssen (PBL)
10:40-11:00	Discussion Session 1	*All*
11:00-11:20	*Coffee break*	
11:20-13:00	$PM_{2.5}$ discussion session along questions prepared by the EIONET NRCs, ETC/ACC, EEA	*All*
13:00-14:00	*Lunch*	
Session 2: Air quality modelling (chair: Frank de Leeuw, ETC/ACC)		
14:00-14:20	Effectiveness of European Air Emission Reduction Measures	Jeroen Kuenen (ETC/ACC, TNO)
14:20-14:40	Status FAIRMODE guidance document, use of AQ modelling under AQ directive	Bruce Denby (ETC/ACC, NILU)
14:40-15:00	Discussion Session 2	*All*
Session 3: Air quality reporting results (chair: Cristina Guerreiro, ETC/ACC)		
15:00-15:20	*Coffee break*	
15:20-15:35	Summer 2008 ozone report (results only)	Libor Cernikovsky (ETC/ACC, CHIM)

15:35-15:50	EoI: current status: what received so far; how successful is submission of historical data	Wim Mol (ETC/ACC, PBL)
15:50-16:05	AQ in 2007 as seen from EoI and Questionnaire	Edward Vixseboxse (ETC/ACC, PBL)
16:05-16:20	Discussion Session 3	*All*
17:10	***Coach sightseeing tour in the centre of Warsaw***	
19:30	***Piano concert and dinner in the Royal Lazienki Park-Palace Complex***	

Tuesday 6 October

Session 4: State of the Environment Reporting (chair: Anke Lükewille, EEA)		
09:00-09:15	Overview of SOER2010: Atmospheric Pollution and Urban Environment chapters, Part B	Anke Lükewille (EEA)
09:15-09:30	Poland's presentation related to SOER Part C	Magdalena Brodowska (Poland)
09:30-09:45	Norway's presentation related to SOER Part C	Ingrid Strømme (Norway)
09:45-10:00	Austria's presentation related to SOER Part C	Wolfgang Spangl (Austria)
10:00-10:15	Germany's presentation related to SOER Part C	Arno Graff (Germany)
10:15-10:40	Discussion, first part of Session 4	*All*
10:40 - 11:00	***Coffee break***	
11:00-11:20	Inputs from the PROMOTE / MACC projects (GMES Atmosphere Services)	Laurence Rouil (INERIS)
11:20-11:30	Discussion, second part of Session 4	*All*
Session 5: Air quality indicators and indices (chair: Peder Gabrielsen, EEA)		
11:30-11:50	Discussion paper on air quality indicators	Frank de Leeuw (ETC/ACC, PBL)
11:50-12:10	AirWatch: Near real-time data for European-wide air quality indices	Stefan Jensen (EEA)
12:10-12:20	Discussion Session 5	*All*
Session 6a: Air Quality Directive and Data Flows (chair: Anke Lükewille, EEA)		
12:20-12:40	Update on the Directive on Ambient Air Quality and Cleaner Air for Europe, status of the implementation	Alessandro Bertello (DG ENV)
12:40-13:00	Discussion Session 6a	*All*
13:00-14:00	***Lunch***	

Session 6b: Air Quality Directive and Data Flows (chair: Tim Haigh, EEA)		
14:00-14:20	CAFE/SEIS/INSPIRE project overview	Jean Dusart (JRC Ispra)
14:20-14:50	Cooperation of EMEP/CCC and EEA on near real-time (NRT) data.	Wenche Aas (EMEP/CCC, NILU)
14:50-15:10	NRT data needs from the pre-operational GMES Atmospheric Core Service	Leonor Tarrasón (ETC/ACC, NILU)
15:10-15:30	***Coffee break***	
15:30-15:45	Update on EEA's near real-time data work: ozone, NO_2, PM_{10}	Peder Gabrielsen (EEA)
15:45-16:20	Discussion Session 6b	*All*
16:20-17:00	Concluding remarks followed by discussion	Anke Lükewille (EEA)

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