

# Workshop proceedings

Fourth EIONET workshop on  
Air quality management and assessment

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23–24 September 1999

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# Executive summary

The fourth EIONET workshop on air quality management and assessment was held in Santorini 23–24 September 1999. The main objective of the workshop was to discuss current European air quality issues and the work of the European Topic Centre on air quality (ETC/AQ) and its partners in the Phare Topic Link on air quality (PTL/AQ) with institutions and experts from European countries, the European Commission, and with collaborating international institutions. This is part of the key task of the European Environment Agency (EEA) to coordinate and develop the European environmental information and observation network (EIONET).

The workshop was attended by 54 participants from 28 European countries and the Environment DG, JRC, EMEP, WHO and the EEA.

Sessions with presentations and discussion were held on:

- air quality information as a basis for AQ policy;
- air quality networks, data and reporting (information flow from NRC to ETC/PTL);
- access to information (information flow from ETC/PTL to NRC/EIONET);
- urban air quality assessment and management;
- discussion in work groups and in plenary and key recommendations.

Demonstration sessions were included:

- demonstration of web access to Airbase;
- demonstrations of air quality management software tools.

In addition to the workshop conclusions and recommendations, this report presents brief summaries of each presentation, as well as copies of selected transparencies shown. Discussions are summarised.

The workshop was also supported by:

- Ministry of the Aegean, Greece;
- Ministry of Development (General Secretariat for Research and Technology), Greece.

# Workshop conclusions and recommendations

Conclusions and recommendations presented during the workshop were drafted by the ETC/AQ based upon the outcome of discussions, particularly the reports to plenary sessions after the group discussions. These were then discussed and amended.

## **Session 1      Air quality information as a basis for AQ policy**

### **Overview of ETC's work:**

- Monitoring data serves the purpose of supporting action and measures by international bodies and countries, which results in public awareness and protection.
- The quality of data and information affects the quality and cost-effectiveness of abatement measures at the European level (EU legislation, protocols) and, consequently, of national abatement measures. Submission of high quality, harmonised data is therefore essential.
- Air quality indicators are important for monitoring progress in the restoration or improvements of the environment, as well as on the efficacy of policy making.
- It is a major task of ETC/AQ to contribute to avoiding duplication in the reporting of air quality data and information by countries to international organisations.
- ETC/AQ has produced:
  - infrastructure and tools such as the air quality database (Airbase), the air quality monitoring network Euroairnet, the air quality model documentation system (MDS) and the GEA (general empirical approach);
  - reports and contributions (Euroairnet status, Airbase access, EU-98, yearly indicator report, ozone reports, exchange of information report)
  - Support of EU countries and international organisations through a number of projects (support of EU working groups on new air quality directives, Auto oil 2 programme, guidance on implementation of new air quality directives).
- In the ETC work, consolidation is now important, where the focus is on quality rather than on completely new work elements.

## Session 2 Air quality networks, data and reporting

### Euroairnet:

Improvements along the following lines were called for:

- improve selection and selection criteria, and provide guidance on:
  - location/representativeness of stations, also with regard to each compound;
  - consider more compounds.
- Improve on the station class criteria:
  - develop more quantitative station class criteria;
  - enhance the meta-data requirements.
- Data quality:
  - get more information on data quality objectives (DQO) from countries, and then re-evaluate the criteria;
  - consider the balance between data quality and data coverage: enhanced demand on station selection may lead to reduced quality of the data that are reported.
- Coverage:
  - ‘sufficient coverage’: should mean sufficient to enable a comprehensive mapping all over Europe;
  - clarify: What coverage is needed to do this?
  - if necessary, re-evaluate the selection criteria.
- Complete Stage 1 of Euroairnet before going further. ‘Completion’ means that most countries (at least 80 %) have completed the evaluation/acceptance procedure.
- Make connection between Euroairnet and requirements from the framework directive and daughter directives.  
Important items:
  - stations for exceedance/compliance documentation;
  - zones.

It is considered important that Euroairnet includes all stations selected for compliance monitoring by each country, and that the ‘selected area’ concept in Euroairnet is harmonised with, or related to the ‘zone’ concept of the FWD.

### Airbase/data exchange module (DEM):

- DEM:
  - The DEM development is on track, however much can be improved, as suggested and indicated by national experts.
  - ETC/AQ will transmit a questionnaire to the countries to get specific input on which extensions are considered most important.
- Airbase contents:
  - The JAVA web application provides user access to the data.

- ETC/AQ together with data suppliers should invest in consolidation of the database: to fill in data gaps (years of data are missing for many countries), to ensure the quality of the data.
- Technical details and definitions concerning data transfer:
  - ETC/AQ will participate in the EoI technical working group, to help ensure harmonisation of data transfer procedures between the EoI and the Airbase/DEM.
- Improved harmonisation with other international organisations (EMEP, WHO, etc.) is needed, as regards data format and transfer procedures.

### **Session 3      Access to information**

#### **European Environment Reference Centre (E2RC)**

- There are two main target groups for the E2RC: The public and experts.
- To reach the general public, near real time information is of prime importance
  - Member countries have most expertise on AQ indices;
  - ETC/AQ can mediate to streamline the information flow.
- The public as target group should not be underestimated
  - simple (aggregated) information and explanations is important to enhance the use by the public of AQ information;
  - the public should be provided with answers to questions, when they access the data and information.
- Experts should have access to all data and related information.
- Airbase is now well developed, and is approaching its intended profile.
- Improved access to Airbase, with all its AQ and meta-data, remains primarily a need for the expert users.
- Inclusion of news items on the E2RC was not yet considered a priority.

EEA should issue a strategy document guiding the further development of E2RC: main directions and priorities.

### **Session 4      Urban air quality assessment and management**

- Urban assessment at European level is considered useful, and work in that direction should be continued.
- The question was posed: Should ETC/AQ approach local AQ managers in an effort to enhance the work on urban AQ assessments in Europe?  
Divergent responses were noted:
  - No, leave it to the national level;
  - Yes, it is important that ETC/AQ contact ‘real life’, and establishes collaboration.
- There is a perspective for more and closer collaboration with WHO in impact assessment, and this should be enhanced.

# 1. Introduction

The EIONET workshop on air quality management and assessment was held in Santorini 23–24 September 1999, organised by the EEA European Topic Centre on air quality (ETC/AQ).

The workshop is the annual meeting between ETC/AQ/PTL/AQ and its EIONET cooperative partners, especially the national reference centres (NRCs) of EEA member countries and Phare countries.

Specific objectives of the workshop were to:

- discuss progress and problems in the work related to Euroairnet, Airbase, DEM and web access to Airbase;
- listen to suggestions and comments from NRCs and develop better collaboration for exchange of information between the NRCs, ETC/AQ and PTL/AQ;
- enhance collaboration with international organisations such as EMEP, WHO.

At the workshop, the following draft reports were made available:

- Euroairnet, status report 1999;
- Airbase, The EEA air quality information system. 1999 status and developments foreseen;
- DEM version 2 manual;
- air quality in larger conurbations in the European Union;
- air quality in Phare countries, 1997.

The workshop was attended by 54 participants from countries and international organisations:

- 18 from 13 EEA member countries;
- 13 from 13 Phare countries;
- 1 from other countries (Azerbaijan)
- 5 from collaborating institutions (DG Environment, EMEP, ETC/AEM, JRC-ERLAP, WHO)
- 15 from EEA/ETC/AQ/PTL/AQ.

In addition, 3 participants for demonstration of software tools.

The workshop programme and list of participants are attached at Annex 1 and 2, respectively.

There were sessions on the following topics:

**Session I:** Air quality information as a basis for AQ policy: How did we use your data?

- Overview of ETC/PTL/AQ products and assessments

**Session II:** Air quality networks, data and reporting (data flow from NRC to ETC)

- status of Euroairnet, and plans for further development;



- status of Airbase and reporting tools (DEM), and plans for further development;
- harmonisation of international AQ data collection;
- continued integration of Phare countries reporting into EC exchange of information/ozone reporting.

**Session III:** Access to information (flow from the EEA/ETC to NRC/EIONET)

- The European Environmental Reference Centre (E2RC) — Air
- The extended web site access facilities to Airbase

**Session IV:** Urban air quality assessment and management

- Auto Oil 2 programme/general empirical approach (GEA)
- European air quality data for health impact assessment (presentation by WHO).

The workshop was supported by:

- Ministry of the Aegean, Greece
- Ministry of Development (General Secretariat for Research and Technology), Greece.

## 2. Summary of workshop presentations and discussions

In the following, the presentations and discussions at the workshop are summarised. From the discussions, only the main points are mentioned. However, all the comments and contributions from the various countries and of ETC/AQ representatives have been recorded and are taken into account in further work of ETC/AQ.

### 2.1. SESSION I: Air quality information as a basis for AQ policy: How did we use your data?

First a welcome by the new EEA project manager Roel Van Aalst to the representatives of EEA member countries and Phare countries, and to the representatives of EMEP, WHO, DGXI and JRC-Ispra.

Roel Van Aalst stressed two core aspects of the workshop:

- He emphasised the importance for the EEA of working with the countries. We have to inform each other in a two way process of interaction and listen to the experiences.
- Our success has consequences. Roel Van Aalst had two examples. One is the ozone report of the summer 1999. The EU Commissioner for Environment intends to have a discussion about this on 6 October. The second example is the indicator report, which will be discussed in the Commission on 15 October.

#### *Overview of ETC/PTL/AQ products and assessments: How did we use your data?*

*Dick van den Hout, RIVM/ETC/AQ (selected slides shown in Section 4.1)*

Dick van den Hout, ETC/AQ leader gave an overview of the ETC/PTL/AQ products and assessments. We have to focus on quality rather than on new elements.

The ETC work takes place within a given structure:

- related to needs of EEA member countries, which to a large degree defines the EEA work contents;
- related to EEA, and its monitoring-to-reporting activities (monitoring-data-information-assessment-reporting);
- related to needs of all users, and their need to instigate 'action' based upon the results of the assessments, etc.

There is a large flow of information between countries, EEA/ETC and international organisations/bodies. Here, the flow of information back to countries about the EEA/ETC work must be emphasised.

In the opinion of the ETC leader, the importance of sufficient quality of data cannot be overemphasised, and consolidation is presently more important than bringing new elements into the work. Specifically stated:

- The main objective of the data/information assessment and reporting is to support action and inform international bodies for future actions on the countries. Therefore, the air quality information comes back to the countries and the general public.
- High quality of data is needed in a harmonised way that fits user needs.

Specifics about the present status of the ETC/PTL work is given in the status on the next pages.

Conclusions:

- Significant progress has been achieved in data coverage and quality.
- Also consolidate: focus more on improving existing structures than on adding completely new elements:
  - high quality input;
  - solid tools;
  - high quality and adequate output.
- Air quality information is the basis for international measures, so it directly affects the countries: high quality (such as good coverage) is very important.

## 2.2. SESSION II: Air quality networks, data and reporting (flow from NRC to ETC)

### 2.2.1. Status of Euroairnet, and plans for further development

*Steinar Larssen, NILU/ETC/AQ (Selected slides shown in Section 4.2)*

Reference is given to the Euroairnet status 1999 report.

Euroairnet (EAN) has developed to a stage where station selection is a continuing process. The Euroairnet 1999 status report demonstrates this. Countries were given feedback on their station selection from the ETC in late August.

The aims for Stage 1 in the development of EAN were reiterated (i.e. 'Exposure assessment on European scale based upon monitoring alone', to obtain: a general description of European AQ, compare networks and AQ between cities and areas, and estimate exposure of population, materials and ecosystems). The response level by EU MS (29 %) is lower than that of Phare and other countries (41 %).

At present, selected stations have been properly classified by quality class. Next question is: are all relevant stations included? Here, relevant means: satisfying the criteria, and likely to contribute to (impact or exposure) assessments. Countries are thus requested to see if the number of relevant stations could be enlarged. To this end, all countries are requested to:

1. assess whether all relevant stations are included in Euroairnet, and if not, to enlarge the number of stations selected;
2. answer special questions related to the classification: 'traffic' and 'rural' stations;
3. fulfil compliance with data quality objectives;
4. describe monitoring methods used (reference and non-reference).

For future exposure assessments it is necessary for countries to also provide maps depicting the location of stations in cities, and information on the size of the population represented by each station.

The proposal made by EU Member States to have Euroairnet concepts becoming part of the EoI legislation update process, is appreciated as the strongest compliment for this work of ETC/AQ. An ad hoc technical working group on EoI (chaired by Germany, and to convene in Berlin November 1999) will discuss this proposal.

### **2.2.2. Status of Airbase and reporting tools (DEM), and plans for further development**

*Rob Sluyter, RIVM/ETC/AQ (Selected slides shown in Section 4.3)*

Reference is given to the report Airbase, the EEA air quality information system — 1999, status and developments foreseen, September 1999.

The data exchange module (DEM v1) was used by 22 countries for the 1998 data reporting cycle (1997 data). The number of time series transmitted increased considerably and the quality of meta-information, in particular, has increased. Data suppliers reported small bugs and gave feedback on the use of DEM in practice through the DEM help desk, which was used extensively. The overall user-friendliness of the DEM was rated satisfactory, but the data file import module proved to be much too slow. DEM version 2 (DEM v2), which was released in June 1999, improved run-time speed by a factor of 30–60 compared to version 1. The system is now substantially consistent with EMEP (EBAS) NASA-AMES file format implementation. The new ISO-7168-2:1999 file format will be implemented in the next version.

A few additional points were highlighted:

Although the number of station data series increased by a factor 4 (1600 series), these are still too few series to map pollution levels throughout the Community with sufficient coverage and accuracy. Only classical pollutants are transmitted and expansion is needed, e.g. benzene for the daughter directive. To assist Member States in recognising gaps in data reporting, three slides were shown:

- ‘The number of time series for 9 air quality parameters over the period 1968–98’;
- ‘The cumulative percentage of these components in the same period’;
- ‘The number of series per component to be found in EoI technical report: Example Ozone 1980–97’. MS are strongly requested to fill in the noted gaps.

The presentation concluded:

1. large historical gaps still exist in the time series which result in a fragmented database;
2. this will largely prevent trends to be evaluated at the European level;
3. hardly any data from southern Europe and no data for France and Germany (as of September 1999. German data has subsequently been included in Airbase);
4. only classical pollutants are reported.

The discussion opened with the interaction between countries and the Airbase team, referring to the major channels of communication. Two observations confirmed the given presentation:

1. The development of legislation regarding benzene was made without an available EU-wide data set: there is a need to also add ‘new’ pollutants in programmes in support of policy making;

2. Governments need to show improvements resulting from implementation of newly adopted legislation: the ETC needs to be able to show changes over time robustly.

With reference to absent data from France, it was clarified that a technical format problem so far blocked data transfer from France to Airbase. France uses the extended ISO format for 40 networks from 1992, a total of 600 stations. Only in 1999 did this ISO format gain international acceptance. Adapting DEM to support this ISO format will not be a small job and will therefore consume quite a large share of the ETC's limited resources. It is hoped the Teresa/IDA-2 programme will provide the required funds.

### **2.2.3. Harmonisation of international AQ data collection**

*Roel Van Aalst, EEA (Selected slides shown in Section 4.4)*

The EEA wants to avoid duplication and hence to reduce the reporting burden of countries by harmonising data reporting requirements from an array of international organisations. At the moment different deadlines, procedures, formats etc are used, calling for harmonisation. For the EEA's efforts to be successful, the assistance of the countries themselves is needed. Reporting to international organisations is based on the mandate given to these organisations by the countries. Therefore, countries are requested to use their position as mandate giver to urge international organisations to work positively towards harmonising and streamlining reporting efforts. Recognised ways to achieve harmonised reporting are:

- harmonising transfer formats and software;
- ensuring compatibility of databases;
- improving accessibility of data;
- synchronising reporting dates;
- forwarding data to other fora;
- coordinated reporting.

An analysis was given of progress made, problems encountered, and solutions proposed for each of the different international organisations.

In conclusion, it was proposed to improve the output and reduce the efforts of countries, the EEA and others involved by:

- harmonising transfer formats and procedures;
- coordinating databases and data access;
- merging reports as far as practical.

Of course this cannot be accomplished by EEA alone: We need help from all of you.

### **2.2.4. Continued integration of Phare countries reporting into EC exchange of information (EoI)/ozone reporting**

*Libor Cernikovský, CHMI/PTL/AQ*

The layout of the 1997 PTL report on air quality in Phare countries, was presented, as was the overview of 1998 ozone data, and 1999-summer ozone

exceedances for Phare countries. Eight Phare countries reported 1998 and 1999 ozone data. All data used is available at the PTL website (<http://www.chmi.cz/ptl/>).

Concluding the presentations of this session, Stoyan Blagoev informed the workshop delegates of developments regarding, and status of, the Phare topic link (PTL) on air quality. (No overhead transparencies were used).

During 1998 and 1999, ETC/AQ and PTL/AQ had progressed towards becoming one integrated, extended ETC/AQ. Unfortunately, however, the contractual basis for the PTL ended in September, a few days before this workshop. The DG-1a (Phare Bureau) of the European Commission launched a tender to renew 5 PTLs, for AQ, AE, IW, MC, and NC, starting January 2000. No doubt that for central European countries the demonstration of compliance with air quality reporting demands following from European legislation, can be of great value for the accession process, reporting already given shape by ETC and PTL. It is expected that an EU decision to start negotiations with accession countries is expected to be taken at the Helsinki Council meeting in December; meanwhile, 11 countries have applied for EEA membership.

<b>Phare ozone 1998 and 1999 summer exceedances data exchange (September 20<sup>th</sup>, 1999)</b>		
Country name	1998 ozone data	1999 summer exceedances data
Albania	-	-
Bosnia and Herzegovina	-	-
Bulgaria	-	-
Czech Republic	YES	Total 22 exc. on 7 stations, 1h max = 222 µg/m <sup>3</sup>
Estonia	YES	No exceedance
F.Y.R.O.M.	YES	Total 2 exc. on 2 stations, 1h max = 189 µg/m <sup>3</sup>
Hungary	-	-
Latvia	YES	No exceedance
Lithuania	YES	No exceedance
Poland	YES	Total 17 exc. on 3 stations, 1h max = 200 µg/m <sup>3</sup>
Romania	-	-
Slovak Republic	YES	33 exc. on 2 stations, 1h max = 206 µg/m <sup>3</sup>
Slovenia	YES	No exceedance

#### 2.2.5. Reports of discussions in parallel groups to the plenary

The group participation is shown on page 53.

<b>Q1 Is Euroairnet developing into a ‘representative network with sufficient convergence and quality’?</b>
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#### Group 1:

From questioning the words ‘representative’ and ‘sufficient coverage’, the group raised the question of the goals of Euroairnet. These appear to be threefold:

- providing comparable data over Europe;
- assessment of exposure of the population, and provide information underpinning emission reductions;
- the evaluation of air pollution trends.

As far as ‘sufficient coverage’ is concerned, the goal would be to allow (for most pollutants at least) for a comprehensive pollution mapping across Europe.

**Group 2:**

EoI criteria seem too ambiguous to easily distinguish between urban and rural areas in station classification:

- Rural stations should actually be outside cities and towns.
- It is advised not to accept stations as rural if these are located within villages with more than 1000 inhabitants.
- The area represented by a station might differ in size depending on the compound at hand. Further guidance seems welcome for operational choices, such as station location and equipment per station, depending on station objectives and QA/QC criteria.

The question should be answered after 2000, but rephrased as: How successful is Euroairnet now (after five years) as a representative network on the EU scale?

**Group 3:**

Euroairnet is a representative network, but it is still limited to few compounds, and stations will probably change due to the framework directive and daughter directives.

Furthermore: How does the concept of zones fit with Euroairnet specifications; Guidance is required on zone application.

Different zones may be needed for different pollutants.

<b>Q2      What are the priorities for Euroairnet improvement and development?</b>
--

**Group 1:**

The main concern seems to be to harmonise and improve the criteria of station selection and QA/QC. The criteria for representativeness need further work, allowing to better select the locations (and number) of measuring stations. Definitions for class characterisation should be improved and extended. Countries are faced with too large differences in station characteristics that are apparently needed by international organisations, blocking, in fact, harmonisation of data delivery by member countries. The comparability of stations should also be improved, by providing better/more refined information (or description) of stations.

**Group 2:**

First priority is to complete the first phase of Euroairnet: so consolidate! Complete the meta-information in Euroairnet. The current aims for the first phase are already a challenge, and it is advised to jointly conclude — on a country-by-country basis - whether or not aims for the first phase are sufficiently met.

**Group 3:**

One database is proposed with formal competence of clearing house functions for ETC/AQ. distinct data quality objectives (DQO) are needed for all countries, as well as the identification of the organisation in each country with the mandate to decide on these DQO.

A proper balance between quality and coverage is needed. It was noted that strict DQO present problems with historical data and trends. For some station types more specific definitions of representativeness are needed.

<b>Q3      How to make Airbase more complete and relevant?</b>
--



**Group 1:**

Give experts the possibility to suggest new features, since constant changes in network design and measured pollutants do take place. Again, characterisation of stations (workable definition) should be improved in order to improve representativeness and allow for its assessment. Overall accuracy of measurements should be included.

**Group 2:**

Member States would like to receive quick feedback after DEM information has been sent in. Member States will rank the DEM V3 options during this workshop (and on request immediately after this workshop). Difficulties exist/persist in transferring data from national databases into DEM formats.

**Group 3, in response to questions 3 and 4:**

The DEM is generally good, but some small problems remain:

- The DEM is not suited for input of large quantities of meta-data.
- It is proposed for DEM to facilitate less raw data and more statistics. (There are still some problems with raw data import).
- Status of Airbase is not clear.

<b>Q4 Are the reporting tools (DEM V2) appropriate?</b>
---

**Group 1:**

Yes, for a majority of users, aside from minor problems reported to the ETC. The conclusion seems to be: 'The burden to introduce data has been reduced and the quality improved'.

Further improvements seem to be related to the need to define new features in a consistent manner. The question arose whether the possibility to introduce measurements from passive sampling probes can be considered. Also:

- Can DEM facilitate batch processing for AQ-data?
- There is a problem of correcting erroneous meta-information;
- Schedules are tight for reporting ozone, within the given deadline;
- Could a possibility be realised to report more than once a year?

**Group 2:**

The next web tool will show whether selected stations contain monitored information for requested parameters. Procedures are needed to delete erroneous meta-information.

<b>Q5/6 Can we take advantage of national reporting procedures? Conversely, have you used DEM concepts in your regional-to-national reporting?</b>
--

**Group 1:**

No enthusiasm for these topics.

**Group 2:**

For some countries and for ETC/AQ, experiences have shown to be of mutual benefit.

**Group 3:**

It is not clear how we can learn much from national reporting; regional situations are likely to be too specific. No DEM is used below national level.

<b>Q7</b> <b>How can NRCs help the ETC to remove duplication and improve harmonisation of reporting procedures?</b>
---

**Group 1:**

Identify the responsibilities for the provision of data to various organisations within a country. Improve the data flow, compatibility with EoI of Euroairnet. Reporting under the FWD is to be addressed.

**Group 2:**

No experience at national level of harmonised data submissions yet, but NRCs want to strongly support such initiatives. NRCs are willing but lack sufficient authority to enforce harmonised reporting.

**Group 3:**

This is covered at 2: One database, with formal clearing house functions should reduce duplication of effort.

**2.2.6. Plenary discussions of sub-group reports**

As the next phase of data use is trend analysis, countries are requested to adopt new, more stringent, DQO. The ETC and EIONET countries are moving towards spending fewer resources on the primary data flow, while still improving/extending the functionalities of the DEM. The ETC is now to further analyse the acquired data.

The need to improve meta-data and related facilities was clearly flagged, both fundamental improvements (beyond station typology) and practical (half of the stations still lack meta-information). It is proposed to proceed in two steps:

1. To contact the EoI technical working group (W. Garber) and coordinate efforts;
2. To invite all Member States to participate in these discussions. (not all EU Member States are members of the FWD guidance working group, or EoI technical working group, yet all should be in the position to propose improved modes for station definition and characterisation). ETC/AQ will produce such proposals for improvements.

To improve a mutual and shared understanding of aims behind data collection, simple, usable and unambiguous definitions are needed for concepts like 'quality' and 'representativeness'. Simplicity is of key importance, as it comprises the best promise to obtain results in practice.

The quality criteria of Euroairnet and the daughter directives are viewed as different, though complementary. The Environment DG confirms that the purpose of data collection with respect to the framework directive is assessing air quality with the aim of improving air quality. Assessments are needed to monitor progress after measures have been taken, and to identify remaining air quality problems.

It is understood that questionnaires, and also the DEM, are not optimised yet to use by larger countries or large multi-year data transfers. On the other hand, larger countries are generally better staffed to handle larger data sets. There is, as yet, no alternative for countries like Germany to distribute the Euroairnet questionnaires for over one hundred stations down to the *Länder*. The larger countries on the other hand will be consulted for next design phases of the DEM. The ETC is receptive to suggestions, but asks for understanding when budget constraints are limiting, needed design improvements.

France is invited to send information on national experience regarding station characterisation and typology to EEA, ETC/AQ, EoI technical working group and the guidance to assessment working group. Both working groups could strongly influence work done both by Member States and the ETC. Efforts following from new EU regulation and current work should be merged, maintaining emphasis at contributions for the Commission, with ETC work structurally in support.

The necessity for Member States to submit raw data was questioned, especially when new directives require from Member States to make their own assessments, and report these. It is felt that in order to produce EU-wide assessments based on either assessment reports from Member States or from reported data from Member States, a common set of raw data is required to substantiate conclusions with EU-wide statistics. These issues are currently under discussion at both EEA and the Environment DG. Further discussions on this topic are expected at the working group on guidance.

It is advocated that the ETC should now concentrate on (data-based) output, rather than on data processing and databases. The information based on data from Member States is currently already used at the highest EU political levels. We all should get our priorities right, and bring Euroairnet further into this new stage, since five years of development should be sufficient to help solve air quality problems from now.

EEA is currently evaluating itself. The evaluation aims to improve EEA in its functions by adjusting both its organisation and procedures. In this process the connections with member countries are reviewed as well. One major question concerns the progress made in the past 5 years: the status of 1995 will be compared with the present. For ETC/AQ this would mean a comparison of 1995, with two incompatible databases, APIS and Girafe and their use, versus Airbase and its use. However, gaps persist, such as uneven coverage of classic pollutants versus new ones, and limited continuity within data series. In future, technological possibilities might bring new arguments to the debate concerning one central versus a distributed database for air quality.

There is strong support for EEA to take next steps towards harmonisation of data reporting by countries. For databases, the point of departure remains that countries hold ownership of data, while international organisations, such as EEA, OECD, EMEP, WHO, etc, manage and process data for selected purposes, as mandated by members. Countries can therefore reprimand international organisations when these appear to be overly demanding on data characteristics or when these are shying away from harmonising data submissions. It is questioned whether differences in DQO of the various international organisations are realistic and functional. The ETC should evaluate these differences, remove redundancies, and propose a set of DQO that would allow for harmonised data submissions with mutual references to the different databases. Current successes are the mutual use and reference of ETC/AQ-Airbase and EMEP-EBAS. Ways are sought to pre-fill the

Eurostat/OECD questionnaire with Airbase data, for which countries will be approached for additional information. This should also be the case for WHO enquiries, as full use of Airbase by WHO was agreed to on previous occasions.

### Subgroups for parallel discussions on questions in Session II

Group 1		Group 2		Group 3	
Rasse	Bel	Desiato	IT	McGettigan	IRE
Heidam	DK	Petursson	ICE	Bostrom	SWE
Joelle	FRA	Salmi	FIN	Christobal	ES
Bräuniger	DE	Mol	NL	La Grotta	IT
Serafimov	BG	Angelovska	FYROM	Gasparini	IT
Fiala	CZ	Bozo	HUN	Ciolkowska	POL
Kort	EST	Leitass	LAT	Petroaica	RDM
Xhillari	ALB	Tijunaite	LITH	Byrda	SLK
Yankovich	AZER	Romic	CRD	Planinsek	SLV
		Simic	Montenegro	Tarazenko	BLR
Skouloudis	JRC	Blagoev	EEA/PHARE	Koch	ETC/AE
Hjelbrekke	EMEP	Larssen	ETC	McLoughlin	EC
Van Aalst	EEA	Sluyter	ETC	v.d. Hout	ETC
Lazaridis	ETC	Bannink	ETC	Helmis	ETC

## 2.3. SESSION III: Access to information (flow from ETC to NRC)

### 2.3.1. The European Environment Reference Centre (E2RC) — Air

*Bert Bannink, RIVM/ETC/AQ (Selected slides shown in section 4.5)*

The aim for the European Environment Reference Centre (E2RC) is to develop a public information service, recognised throughout Europe as the gateway to easily understandable and efficiently structured environmental information, wherever possible in the user native language. The Reference Centre will provide seamless access to a wide variety of distributed environmental information, in particular information developed through EIONET.

The main gateway to E2RC is the EEA web site with its links to data warehouse and topic databases. The main building blocks of the E2RC are the directory of EEA/EIONET information resources and gateway to other information providers such as GELOS (global environmental locator service) and EC CHM (community clearing house mechanism for biodiversity).

The role of ETC/AQ in E2RC is to make air quality data available to main clients and the public, making Airbase data easily accessible and provide access to the model documentation centre (MDS).

### 2.3.2. The extended web access facilities to Airbase

*Rob Sluyter, RIVM/ETC/AQ (selected slides shown in section 4.6)*

A number of improvements and extensions have to be implemented to further increase the user-friendliness of the DEM. Examples are batch processing of data files, bulk entry of meta-information, implementation of the extended version of the new ISO-7168 file format and regional copies of the database. It was agreed with countries that they would rank the extensions according to their priority (through a questionnaire). The new operational prototype of the Airbase JAVA applet was demonstrated. This gateway to Airbase information was developed based on guidance given by the countries. The applet will be further developed

and the final release is scheduled for October 1999 (subsequently postponed to December 1999).

### *2.3.3. Reports of discussions in parallel groups to the plenary*

#### **Q1 What information should be on the E2RC — Air?**

##### **Group 1:**

- Compatibility between national display to the public and the EEA mandate;
- Importance of European global display;
- Near real-time data will be of interest to the general public;

##### **Group 2:**

- Real-time information. Several countries have already real-time systems. An option would be to establish an Internet link with those sites. However, a major drawback is the different languages.
- A more advanced option would be to define a 'common' page in the English language, that each system should include and fill with real-time information. This option relies mainly on national and local efforts.
- Historical data. The selection of stations for both EoI and Euroairnet is the first mandatory step. There is a need for filling gaps in historical data for both EoI and Euroairnet. Guidelines for EoI are already available. For Euroairnet the ETC has provided guidance.

##### **Group 3:**

- Historical data and near real-time data are essential. However, we must be careful with pollution forecasts since since forecast is important, it requires proper QA.
- Pollution forecasts are responsibility of countries/regions. They must be very simple.
- The countries must have the same tools and procedures for assessing the historical data.

#### **Q2 What should be the target user group?**

##### **Group 1:**

- Newspapers and the Internet
- Information on sectors should be added (e.g. traffic, industry).

##### **Group 2:**

- Currently the target user group are NRC or experts. It would be worthwhile to broaden the target to other categories. Different information/products should

be prepared for different groups. The general public is an important target group but difficult to reach with simple and clear information.

**Group 3:**

- Special purpose users, e.g. regulatory authorities.
- Information should generally go to everybody but should include proper evaluation/interpretation.

**Q3 What Airbase improvements are desirable?**

**Group 1:**

- Airbase should be in permanent improvement
- Possibility to make presentation of display systems

**Group 2:**

- There is a need for a quality flag of data on the web access, in order to give information on quality of historical data.

**Group 3:**

- Add information/guidance on model use/application;
- Information to public must be very simple and attractive to use;
- Proper line of communication regarding data and problems (full use of meta-data);

(The group composition was as indicated in discussion session I (see Section 2.2.6).

## **2.4. SESSION IV: Urban air quality assessment and management**

### **2.4.1. *On recent developments on urban air quality assessment and management: methodologies and tools***

*Roel Van Aalst, EEA (Selected slides shown in section 4.7)*

Urban air quality management requires assessment and action at three levels: urban, national and European. The urban environment and urban air quality is a priority area for EEA and the ETC. One challenge is to estimate the size of the urban population and the European cities, which are in compliance with air quality objectives in future years, and to identify additional measures at European level for emission reduction. More specifically, information has to be given on:

- emission reduction, which is needed to achieve air quality targets in the majority of cities;
- the fraction of people which will be exposed to air quality concentrations in exceedance of target values; and
- the cities that are in non-compliance given a certain emission reduction.

The work on the 'generalised empirical approach (GEA)' for air quality that was performed by ETC/AQ in the Auto Oil 2 project was presented and discussed. This approach enables urban population exposure estimates, generalisation of assessment results to a large number of European cities and includes multi-year meteorological conditions. The cities selected for GEA should be representative for the urban population within EU and should cover all cities where exceedances of air quality objectives are expected. Given the environmental objectives used in this work, all cities with more than 250 000 inhabitants plus smaller cities, (about 50), with reliable monitoring data were selected. The cities selected in GEA cover about 40 % of the urban population in the EU.

The urban emissions are estimated from Corinair data using a top-down approach proposed by the Topic Centre on air emissions. Further validation is needed for this method.

In GEA, the following tools were used:

- c-Q model for NO<sub>x</sub>/NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>
- Uaqam model for NO<sub>x</sub>/NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>, benzene, B(a)P and Pb;
- OFIS model for ozone.

Roel Van Aalst presented some examples of results from the work. As reference year 1995 was selected, but in the case of lead and B(a)P 1990 was selected since no emission data for 1995 was available. The comparison between the observed concentrations of ozone, NO<sub>2</sub>, PM<sub>10</sub>, SO<sub>2</sub> and the model results shows reasonable agreement, allowing some confidence in the quality of the projections.

Then results for the Auto-Oil II Base case scenario for 2010 were presented. European maps were presented showing cities with exceedances of AQ objectives for the years 1995 and 2010. The c-Q and Uaqam results show good correspondence. In conclusion, the projected emissions for 2010 result in a large improvement of urban air quality but still exceedances are to be expected, mainly for ozone, NO<sub>2</sub> and PM<sub>10</sub>. These conclusions may not apply to Phare countries and it is desirable to extend the study in the future to include these countries.

#### ***2.4.2. European air quality data for health impact assessment — A view from WHO***

*Kees Huysmans, WHO ECEH*

The main activities of the WHO European Centre for Environment and Health (Bilthoven division) are related to updating and promoting of WHO AQ guidelines, strategies for health impact assessment and the promotion of risk reduction in the countries. The aim of these activities is to prevent/reduce risks caused by air pollutants and to provide tools for managing the health risks related to air pollution.

Assessment of the health impact of air pollution is made through the identification of sources of exposure and population exposure patterns and the estimation of health impacts at local, national or regional level, using existing dose-response relationships ('risk ratios'). The WHO ECEH together with the WHO Collaborating Centre for Air Quality Management and Air Pollution Control (Berlin) and ETC/AQ have initiated a new project aimed at evaluating the capacities of Member States to monitor and assess the health impact of air pollution.

The WHO/ECEH AQ data requirements include:

- aggregated data indicative for exposure of population to air pollutants over a certain time period;
- information about the location of monitoring stations;
- monitoring stations, which should be representative for areas where people live and the used databases should have specified completeness of measurements.

All relevant AQ data sources will be used, including Airbase. Considering that the WHO European region consists of 51 countries, the data available, although increasing rapidly, must still be considered scarce.

Kees Huysmans presented the software tool 'AirQ', for health impact assessment. The tool enables assessment of the benefits of various scenarios reducing population exposure to air pollutants and to store and exchange AQ data in a standardised way. The tool can be downloaded from the WHO ECEH homepage ([www.who.nl](http://www.who.nl)).



### 3. Demonstrations of software

#### *Access to Airbase*

The web access through the Java applet tool (called Airview) was demonstrated on a PC available for use by participants. The tool is available at [www.etcaq.rivm.nl/AIRBASE](http://www.etcaq.rivm.nl/AIRBASE), under the search link.

The GIS-based web tool that has been developed in the fourth EU framework IST project 'Irenie' ('Improved reporting of environmental information using the EIONET') was also demonstrated via transparencies. The tool is available at [www.norgit.no/irenie](http://www.norgit.no/irenie), and select Fredrikstad/ENSIS on the map, then 'Common part', and 'Run the demonstrator'.

The two tools complement each other for efficient access to data and its presentation from Airbase.

#### *Air quality management software tools*

Two such tools were presented to the workshop:

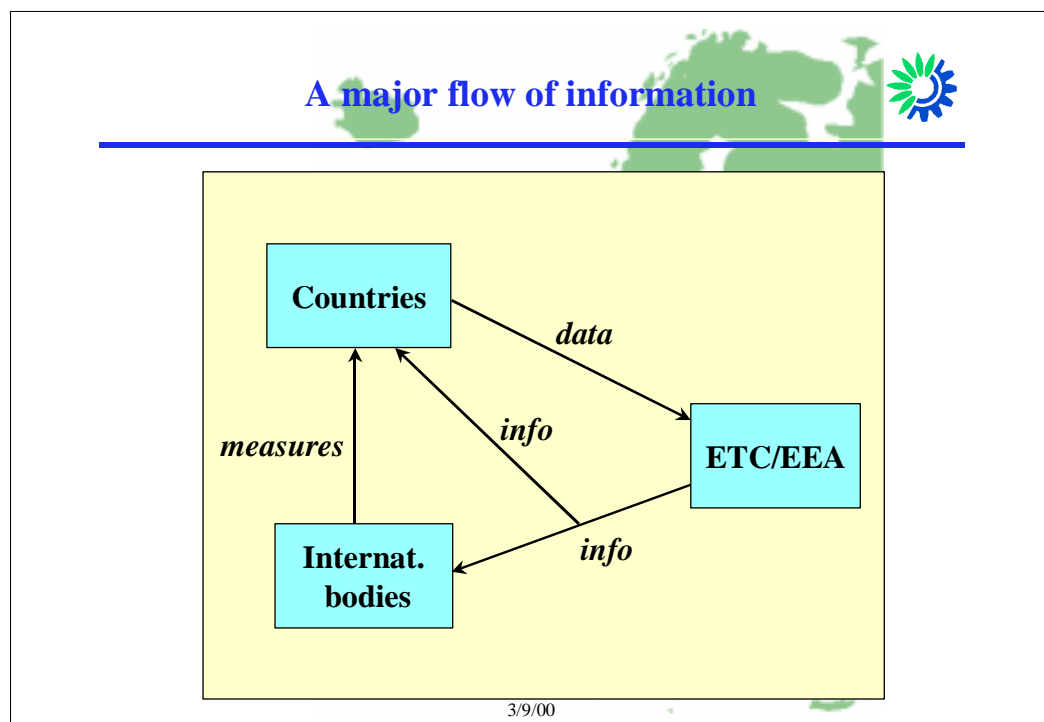
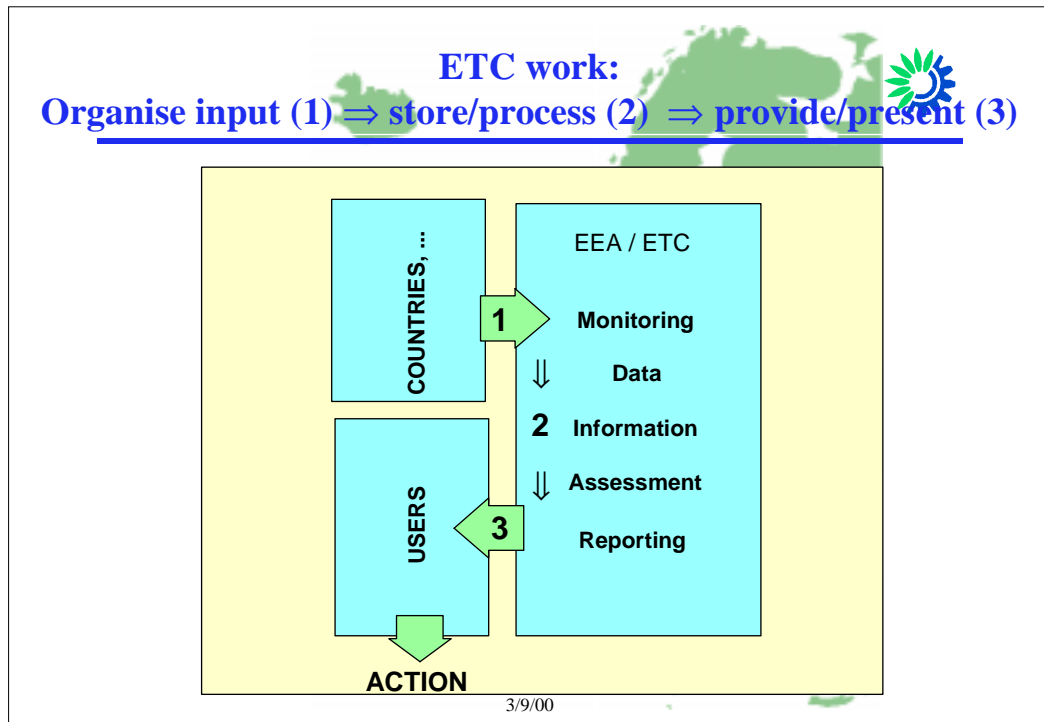
- the ADMS-URBAN tool of the Cambridge Environmental Research Consultants, UK;
- the AirQUIS tool developed by Norwegian Institute for Air Research (NILU) and NORGIT Centre AS, in Norway.

Both these tools integrate modules for emission inventorying, dispersion models and data presentation into a GIS-based system. The tools provide possibilities for improved efficiency in analysing the effects of pollution abatement measures on air pollution concentrations and exposure.

Detailed information about the tools is available from the developers mentioned above.

## 4. Selected slides

### 4.1. Dick van den Hout — How did we use your data?



## Quality!



- \* **Quality of data and information affects quality of measures (EU legislation, protocols, ...)**
- \* **Quality of measures affects countries!**
- \* **So: high quality needed:**
  - \* **“objective, reliable, comparable”**
  - \* **harmonised (common criteria), QA/QC, complete (coverage of territory, of targets)**
  - \* **fitting the user’s needs (indicators, maps, ...)**
- \* **Consolidation: focus now on quality rather than on completely new elements**

3/9/00

## Supply and demand



*Data/information flow (from supply side):*

**Data/info countries ⇒ processing by ETC ⇒ users**

*Definition of info needs (from demand side):*

**Data/info countries ⇐ processing by ETC ⇐ users**

3/9/00

## Allocation of ETC work



- \* **INPUT TO ETC: Establishing and maintaining contacts with suppliers: 25% of work**
- \* **EEA/ETC PROCESSING: Building data&processing tools: 20% of work**
- \* **OUTPUT1: Periodical dissemination/reporting: 35% of work**
- \* **OUTPUT2: Projects in support of clients: 20% of work**

3/9/00

## Work on INPUT from countries to ETC



- \* **Euroairnet**
- \* **Airbase, DEM, ...**
- \* **Model validation**
- \* **Avoiding duplication in reporting (EoI, EMEP, OECD/Eurostat, WHO)**

3/9/00

## **Work on ETC storage/processing**

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### **Development of ETC's tools:**

- \* **Air Quality data base: Airbase**
- \* **Modelling: Model documentation system; development of GEA (general empirical approach) — first step towards ETC modelling instruments.**

3/9/00

## **Work on OUTPUT(1): periodical dissemination/reports by EEA/ETC**

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- \* **Airbase access**
- \* **EU-98**
- \* **Yearly indicator report**
- \* **Ozone reports**
- \* **Exchange of information report**

3/9/00

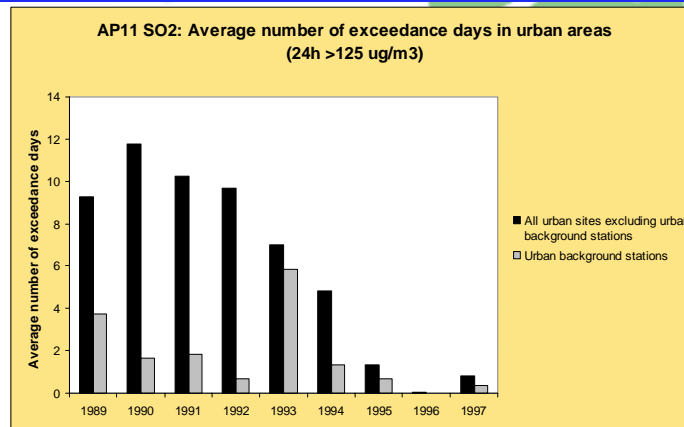
## OUTPUT(2): projects in support of clients



- \* Support of EU WGs on new air quality directives
- \* Auto-Oil
- \* Guidance on implementation of new air quality directives
- \* Ozone forecasting and information exchange

3/9/00

## Example of data use: indicators



Number of sites	1989	1990	1991	1992	1993	1994	1995	1996	1997
Urban e. backg.	41	9	15	9	18	11	30	26	38
Urban backg.	15	6	6	6	17	23	31	14	57
<b>Total</b>	<b>6.00</b>	<b>1.83</b>	<b>1.83</b>	<b>1.83</b>	<b>7.63</b>	<b>8.82</b>	<b>11.00</b>	<b>4.11</b>	<b>14.74</b>

3/9/00

## Example of data use: Ozone reports



- \* **Annual reporting in October on:**
  - \* **Threshold exceedances in previous year (also Phare countries!)**
  - \* **Summer exceedances of preceding summer (preliminary data)**
- \* **Needs to be ready before Environmental Council meeting in October**
- \* **This year particularly important:**
  - \* **First press conference of New Commissioner**
  - \* **Council deliberations on national emission ceilings and ozone strategy**

3/9/00

## 4.2. Steinar Larssen — EUROAIRNET

### **Euroairnet**

#### **Development and Implementation 1996 - 1999**

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1. **Definition** (goal, objectives) 1996
2. **Criteria** development 1996-1998
3. **Visits** to NRCs 1996 - 1998 →
4. **Station selection** 1997 - 1999 →
5. **Evaluation process** 1999 →
6. **Data reporting** to AIRBASE 1997 - 1999 →

S.Larssen EUROAIRNET\_Sept1999

### **Euroairnet**

#### **Goal/Objectives/Stages**

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- \* **Goal** — European network with sufficient spatial coverage and representativeness and quality  
— Efficient and early data reporting
- \* **Stages** (1) Exposure assessment on European scale based upon monitoring alone  
(2) Assessment from a combination of monitoring and modeling  
(3) To support assessment of effects, and cost-effective abatement

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- \* **Stage 1 objectives**
  - \* **General description of European AQ**
  
  - \* **Comparison of networks and AQ between cities and areas**
  
  - \* **Estimation of exposure of population, materials and ecosystems**

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**Selected cities and areas for Euroairnet**  
(for September 1999)



**OVERVIEW**

<b>Cities/aggl.</b>	<b>&gt;25 000</b>	<b>355</b>
<b>Class 1</b>	<b>63</b>	
<b>Class 2</b>	<b>57</b>	
<b>Class 3</b>	<b>198</b>	
<b>Class 4</b>	<b>37</b>	
<b>Industrial areas outside cities</b>		<b>46</b>
<b>Small towns</b>		<b>16</b>
<b><u>Rural areas/stations</u></b>		<b><u>219</u></b>
<b><u>Sum, areas</u></b>		<b><u>636</u></b>

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## Compound Coverage (Euroairnet, for September 1999)



\* *Compound coverage for Population Exposure Assessment. Degree of fulfilment of criteria, Priority 1 compounds*

* <i></i>	<b>SO<sub>2</sub></b>	<b>NO<sub>2</sub></b>	<b>O<sub>3</sub></b>	<b>CO</b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2,5</sub></b>	<b>Benzene</b>
* <b>Total no. of stations</b>	<b>710</b>	<b>638</b>	<b>535</b>	<b>290</b>	<b>190</b>	<b>1</b>	<b>59</b>
* <b>In cities/aggl.</b>	<b>83%</b>	<b>76%</b>	<b>62%</b>	<b>87%</b>	<b>86%</b>		<b>97%</b>
* <b>In ind. areas</b>	<b>8%</b>	<b>6%</b>	<b>5%</b>	<b>5.5%</b>	<b>7.5%</b>		<b>1.5%</b>
* <b>In rural areas</b>	<b>9%</b>	<b>18%</b>	<b>33%</b>	<b>7.5%</b>	<b>6.5%</b>		<b>1.5%</b>
* <b>Average time 1h</b>	<b>87%</b>	<b>95%</b>	<b>100%</b>	<b>100%</b>	<b>89%</b>		<b>100%</b>
* <b>Average time 24h</b>	<b>12%</b>	<b>5%</b>			<b>11%</b>		
* <b>Average time &gt;24h</b>	<b>1%</b>	<b>0%</b>			<b>0%</b>		
* <b>Monitored at % of all station</b>	<b>58%</b>	<b>52%</b>	<b>43.5%</b>	<b>23.5%</b>	<b>15.5%</b>		<b>4.5%</b>

*Italic font in boxes represents combinations of compound and averaging time satisfying the criteria.*

S.Larssen EUROAIRNET\_Sept1999

## Evaluation/acceptance process of Euroairnet selection



- 1. Station selection 1997 - 1999.**
- 2. Evaluation by ETC-AQ June - August 1999**
- 3. Re-evaluation by NRC August - November 1999**
- 4. Finalisation of 1st stage Euroairnet**

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## Evaluation of Euroairnet selection Summer 1999

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### CITIES/AGGLOMERATIONS

Enhanced city selection in some countries

Enhanced station selection: All relevant stations included?

Enhanced compound coverage:

- \* Not covered:  $PM_{10}$ ,  $PM_{2,5}$ , Benzene in many countries.  
 $O_3$  in a few countries.
- \* Other enhancements suggested to some countries.

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## Evaluation of Euroairnet selection Summer 1999

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### INDUSTRIAL AREAS outside cities >50 000

- \* Confirm that the selection fulfils the criteria:

All industrial areas with  $AQ > WHO-AQG/EU$  limit values  
in populated areas.

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## Evaluation of Euroairnet selection Summer 1999

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### RURAL AREAS

- \* All countries should make selection (10 countries have not selected so far)
- \* Countries should confirm that their selection fulfils the criteria:
  - \* at least 50% of the rural population should be represented by the stations selected
  - \* the selection should give a representative picture of the exposure of ecosystems in the country

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## EVALUATION of the QA/QC status

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- \* Data quality objectives (DQO):
  - \* All countries should develop and report their DQOs.
- \* QA/QC procedures classification:
  - \* 2 countries have class 5 networks. Must be upgraded.
  - \* 9 countries have class 4 networks. Should be upgraded over time.
- \* Monitoring networks:
  - \* Mostly reference methods
  - \* Equivalence for non-ref. methods should be documented.

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## Evaluation of the QA/QC status



- \* **Temporal coverage:**
  - \* **3 countries have networks/compounds with too low coverage of the year.**
- \* **Accuracy and precision:**
  - \* **More specific info is collected from countries.**
- \* **Representativeness areas:**
  - \* **Many countries have estimated the RR for each station individually.**
- \* **Representativeness of traffic stations should be re-assessed in terms of length of road.**

S.Larssen EUROAIRNET\_Sept1991

## Implementation of Euroairnet



- \* **Data availability**
- \* **Data quality (fulfilment of QA/QC criteria)**
- \* **Data reporting to Airbase**

S.Larssen EUROAIRNET\_Sept1991

**Contents of data in Airbase  
(number of stations with 1996 and/or  
per September**



**SUMMARY**

	<b>EEA</b>		<b>PHARE</b>	
	<b>1996</b>	<b>1997</b>	<b>1996</b>	<b>1997</b>
<b>EoI' Stations</b>	<b>152</b>	<b>351</b>	<b>0</b>	<b>186</b>
<b>Euroairnet</b>	<b>34</b>	<b>232</b>	<b>0</b>	<b>100+</b>
<b>Fraction of all Euroairnet stations selected</b>		<b>29 %</b>		<b>41 %</b>

S.Larssen EUROAIRNET\_Sept99.ppt

**Countries with  
Euroairnet selection**



*\* Countries, which have made a selection of areas and stations for Euroairnet*

<b>* EEA</b>	<b>PHARE</b>	<b>OTHER</b>
* Austria	Bulgaria	Switzerland
* Belgium	Czech Republic	
* Denmark	Estonia	
* Finland	FYROM	
* Germany	Hungary	
* Greece	Latvia	
* Iceland	Lithuania	
* Ireland	Poland	
* Italy	Romania	
* Liechtenstein	Slovak Republic	
* Luxembourg	Slovenia	
* Netherlands		
* Norway		
* Portugal		
* Spain		
* Sweden		
* UK		

S.Larssen etcaq990629.ppt

**Quality Class of Euroairnet  
networks in countries  
(NRCs own assessment)**



	QA/QC Class					
	1	2a	2b	3	4	5
<b>EEA Member countries</b>						
Austria		X		X	X	
Belgium				X		
Denmark				X		
Finland					X	X
Germany	X	X		X		
Greece						
Iceland		X				
Ireland				X	X	
Italy						
Liechtenstein	X					
Luxembourg						
The Netherlands	X					
Norway	X				X	X
Portugal				X	X	
Spain						
Sweden	X	X				
United Kingdom		X				
<b>PHARE Countries:</b>						
Bulgaria		X				
Czech Rep.		X				
Estonia	X					
FYROM					X	
Hungary		X				
Latvia	X	X				
Lithuania					X	
Poland				X	X	
Romania						
Slovak Rep.					X	
Slovenia						
<b>Other countries:</b>						
Switzerland	X	X				

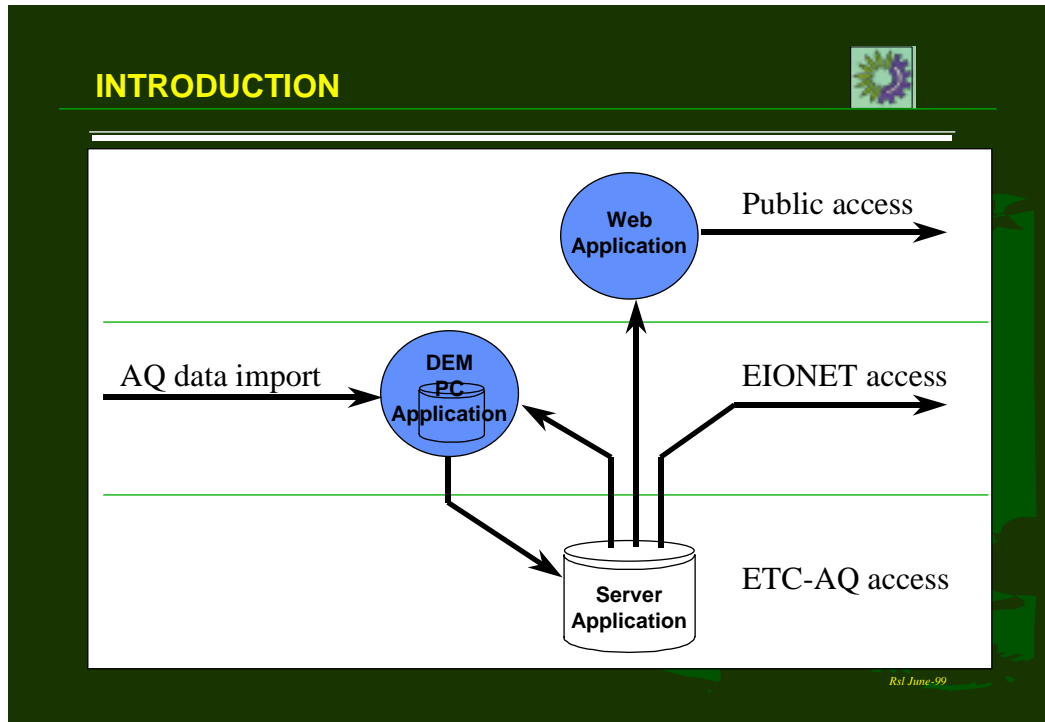
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**No. of 1997 time series in Airbase**

**No. of time series**

- SO<sub>2</sub>: 337 (40 % hourly data)
- NO<sub>2</sub>: 298 (88 % hourly data)
- NO: 134 (all hourly data)
- O<sub>3</sub>: 236 (all hourly data)
- CO: 142 (all hourly data)
- PM<sub>10</sub>: 150 (48 % hourly data)
- TSP: 43 (20 % hourly data)
- BS: 115 (all daily data)

### 4.3. Rob Sluyter — Airbase and (DEM)



- ## DEM VERSION 1 EVALUATION
- ! OVERALL FUNCTIONALITY AND USER FRIENDLINESS RATED SATISFACTORY
  - ! USERS WERE SATISFIED WITH HELP DESK
  - ! RUN TIME OF THE DEM IMPORT MODULE WAS REGARDED MUCH TOO SLOW
  - ! SOME USER MISSED BATCH PROCESSING & POSSIBILITY TO PHYSICALLY DELETE DATA
  - ! A LOT OF SMALL BUGS REPORTED
- RSI June-99



## DEM VERSION 2



- ! NEW EXTENSIONS AND BUG REPAIR ON BASIS OF FEEDBACK GIVEN BY USERS (HELP DESK AND TRAINING WORKSHOPS)
- ! DEVELOPED AS PART OF THE ETC-AQ 1999 SUBVENTION
- ! EXTENSIVE TESTING OF DEM v2 ON LARGE DATA FILES (RUN TIME CHECK!)
- ! RELEASED ON 23 JUNE 1999

Rel June-99

## WHAT'S NEW IN DEM VERSION 2?



- ! NASA-AMES 1001 IMPORT MODULE IN FULL COMPLIANCE WITH EMEP (EBAS) IMPLEMENTATION
- ! ISO-7168-2:1999 IMPORT MODULE IMPLEMENTED FOR RAW AQ DATA AND STATISTICS (CONDENSED VERSION)
- ! RUN-TIME IMPORT MODULE IMPROVED BY A FACTOR **30-60!**  
(14 STATIONS/HOURLY DATA/YEAR: 3 MINUTES INSTEAD OF 3 HOURS)

Rel June99

## WHAT'S NEW IN DEM VERSION 2?



- ! WARNING IF USER IS GOING TO OVERWRITE EXISTING SERIES
- ! NEW FIELD (FILLED BY ETC-AQ): LATEST DATE FOR WHICH DATA IS AVAILABLE
- ! ERROR MESSAGES (IMPORT MODULES) WERE REWRITTEN
- ! REMAINING SMALL BUGS HAS BEEN REPAIRED

*Rsl June-99*

## ISO 7168-2:1999 EXTENDED VERSION



- ! THE EXTENDED VERSION HAS NOT YET BEEN IMPLEMENTED, BECAUSE:
  - ! FORMAT IS NOT INTENDED TO BE USED FOR LARGE VOLUME EXCHANGE
  - ! SOME COUNTRIES HAD SERIOUS COMMENTS
  - ! META-INFORMATION IS ALREADY AVAILABLE IN DEM (REDUNDANT)
  - ! BUDGET RESTRICTIONS

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## DEM HELP!



- ! UPDATED MANUAL (AUTOMATICALLY INSTALLED)
- ! CUE CARDS/HELP ON SCREEN
- ! HELP DESK IN 4 COUNTRIES (SEE MANUAL)
- ! DEM WEB SITE WITH LATEST INFORMATION
- ! **DEM NEWSLETTER BY E-MAIL**

*Rsl June 99*

## DEM VERSION 3?



- ! EXTENSIONS NOT YET IMPLEMENTED:
  - ! BATCH PROCESSING OF DATA FILES
  - ! ISO7168-1:1999 IMPLEMENTATION
  - ! BULK ENTRY META-INFORMATION
  - ! IMPROVED LAY-OUT REPORTS + ADDITIONAL REPORT FUNCTION
  - ! REGIONAL COPIES
  - ! MULTILINGUAL VERSION OF DEM

*Rsl June 99*

## DEM VERSION 3?



### ! MOREOVER CHANGES EXPECTED TO AIRBASE/DATA MODEL, DUE TO:

- ! EUROAIRNET REQUIREMENTS
- ! FURTHER HARMONISATION INTERNATIONAL DATA REPORTING (E.G. EMEP, OECD, WHO)
- ! EOI TECHNICAL WORKING GROUP ADVICES

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## 1998 REPORTING CYCLE: META INFO



- ! 24 COUNTRIES HAVE UPDATED OR PROVIDED THE META-  
INFORMATION ON THEIR STATIONS (22 USED DEM); **DRAFT  
TECHNICAL EOI REPORT READY**
- ! CURRENT CONTENTS: >475 NETWORKS > 5500 STATIONS
- ! QUALITY HAS IMPROVED SIGNIFICANTLY AND IS NOW  
SATISFACTORY (ANNEX II OF EoI)
- ! ONLY 4 COUNTRIES REMAINING WITH OUTDATED  
INFORMATION:  
**FRANCE: 1990**  
**LUXEMBOURG: 1993**  
**PORTUGAL: 1992**  
**SPAIN: 1990**

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## 1998 REPORTING CYCLE: AQ DATA



	SO <sub>2</sub>	Strong a.	Bl. smoke	TSP	PM <sub>10</sub>	CO	NO	NO <sub>2</sub>	O <sub>3</sub>	Other
<b>EU15</b>										
Belgium	61/day	30/day	33/day		13/day	4/hour	26/hour	26/hour	26/hour	Pb:36, Cd: 23, Ni: 20, As:10 (day)
Denmark	4/day			4/day				4/hour	2/hour	Pb:4/day
Finland	9/hour			5/day	1/day/hour	6/hour	5/hour	8/hour	12/hour	
Greece	9/hour		6/day			8/hour	9/hour	9/hour	8/hour	
Ireland		4/day	4/day				???			
Netherlands	39/hour		14/day		19/hour	21/hour	29/hour	44/hour	37/hour	NH3:8/hr
Sweden	9/day		13/day					16/day		Wet dep:1, Ph:1 (day)
United Kingdom	64/hour	12/day	12/day		49/hour	59/hour		82/hour	71/hour	
<b>EFTA</b>										
Norway					3/hour			2/hour		
<b>Phare</b>										
Czech republic	56/day				56/day	26/hour	56/hour	42/hour	31/hr	
FYROM	24/day		27/day							
Hungary	4/day,8/hr			8/hour		8/hour	8/hour	4/day,8/hr	5/hour	
Latvia	2/day							2/day	1/hour	
Lithuania	1/hour					1/hour	1/hour	1/hour	5/hour	Nox:1/hour
Poland	13/day		6/day		8/day	2/hour		15/day,2/hr	16/hour	
Slovak republic	31/day			26/day		7/hour		31/hour	17/hour	Nox:31/hr, H <sub>2</sub> S: 6/day
Slovenia	3/hour							2/hour	5/hour	Nox: 2/hour

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## PRELIMINARY CONCLUSIONS



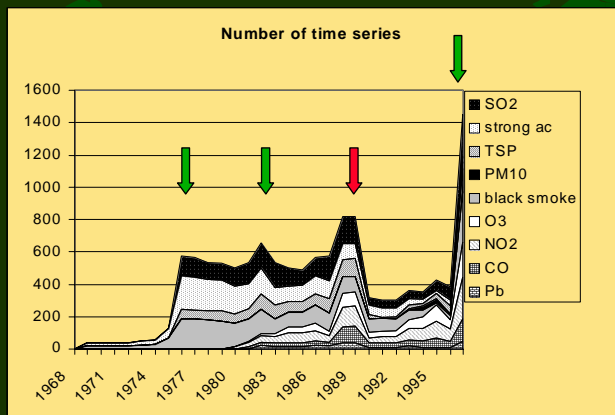
- ! **ALTHOUGH THE NUMBER OF SERIES INCREASED BY A FACTOR 4 (1600 SERIES):**
  - ! **STILL THE NUMBER IS FAR TOO LOW TO BE ABLE TO MAP POLLUTION LEVELS THROUGHOUT THE COMMUNITY WITH SUFFICIENT COVERAGE AND ACCURACY**
  - ! **ONLY CLASSICAL COMPONENTS ARE TRANSMITTED (EXPAND, E.G. DAUGHTER DIRECTIVES: BENZENE)**
  - ! **MOSTLY RAW DATA (PREFERRED), HARDLY ANY STATISTICS**

Rel June99

## HISTORICAL OVERVIEW AIRBASE

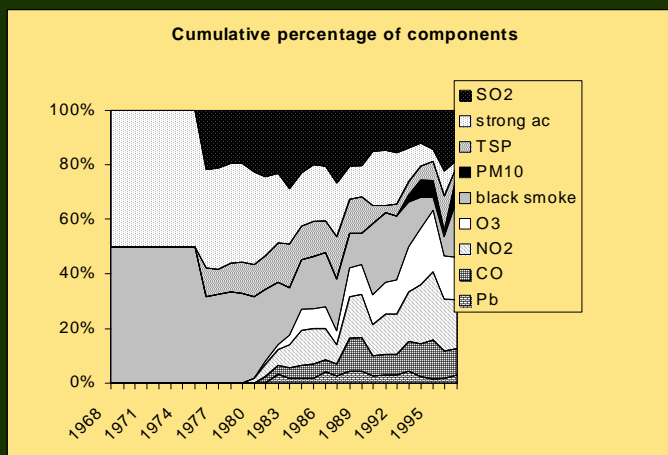


! IN ORDER TO HELP MS IDENTIFY DATA GAPS



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## HISTORICAL OVERVIEW AIRBASE I



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## HISTORICAL OVERVIEW AIRBASE II



### ! NUMBER OF SERIES PER COMPONENT TO BE FOUND IN EOI TECHNICAL REPORT

Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
AT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	25	25	1
BE	0	0	0	0	0	1	4	4	4	4	4	4	4	4	4	4	4	28
DE	0	0	0	0	20	21	21	0	56	60	0	0	3	0	0	0	0	0
DK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
ES	0	0	0	0	0	0	0	3	3	2	2	3	3	2	0	2	0	0
FI	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	10	10	12
FR	0	0	4	7	7	6	0	0	0	0	0	0	0	0	0	0	0	0
GB	0	0	3	3	3	3	3	3	3	2	4	3	3	27	32	35	1	71
GR	0	0	0	2	2	0	0	2	3	3	3	3	3	3	3	3	0	8
NL	0	6	6	6	6	17	15	15	15	20	20	20	20	17	17	17	17	37
PT	0	0	0	0	0	0	1	1	2	2	2	2	2	0	0	0	0	0
CH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
CZ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
HU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
LT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
LV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
SI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
SK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Total	0	6	13	18	38	37	46	28	86	88	35	35	38	58	72	96	61	223

OZONE

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## AIRBASE CONTENTS: CONCLUSIONS



- ! STILL LARGE HISTORICAL GAPS EXIST WHICH RESULT IN A FRAGMENTED DATABASE
- ! THIS WILL LARGELY PREVENT TRENDS FROM BEING EVALUATED THE EUROPEAN LEVEL.
- ! HARDLY ANY DATA ON SOUTHERN EUROPE & NO DATA FOR FRANCE AND GERMANY
- ! ONLY CLASSICAL POLLUTANTS ARE REPORTED

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#### 4.4. Roel Van Aalst — Harmonisation of international data collection

### AQ DATA COLLECTION / REPORTING



- \* EU AQ (daughter) directives
  - \* EU exchange of information
  - \* EEA Euroairnet
  - \* UNECE-EMEP
  - \* EUROSTAT/OECD
  - \* WHO
  - \* OTHERS.....
- .....**ALL WITH DIFFERENT**
- \* DEADLINES
  - \* FORMATS/PROCEDURES
  - \* SPECIFICATIONS (POLLUTANTS, AVER. TIMES...)
  - \* REPORTINGS

### WAYS TO ACHIEVE THIS



- \* HARMONISING TRANSFER FORMATS AND SOFTWARE
- \* ENSURING COMPATIBILITY OF DATABASES
- \* IMPROVING ACCESSIBILITY OF DATA
- \* SYNCHRONISING REPORTING DATES
- \* FORWARDING DATA TO OTHER FORA
- \* CO-ORDINATED REPORTING



## SOME PROGRESS AND SOME PROBLEMS



### EU Directives, EoI, Euroairnet

COMMON TRANSFER SOFTWARE AND FORMAT (DEM)

COMMON DATABASE (AIRBASE)

**INTERNAL INCONSISTENCIES** ---> ACTION MS

**DIFFERENT DEADLINE DATES** ---> MOVE TO 1-7?

**DIFFERENT REPORTS** ---> MERGE

## SOME PROGRESS AND SOME PROBLEMS



### EU AND EMEP

\* COMMON TRANSFER FORMAT WITHIN REACH

\* DATABASES ALMOST COMPATIBLE

\* **DATA ACCESS DIFFERENT** --->LINE UP

\* **REPORTING DIFFERENT** --->LINE UP

## SOME PROGRESS AND SOME PROBLEMS



### OECD /EUROSTAT

- \* **FORMAT DIFFERENT –NO SOFTWARE**
- \* **DIFFERENT REPORTING CYCLE (2Y)**
- \* **DATABASES INCONSISTENT**
- \* **SEPARATE REPORTING**

----> **PREFILL QUESTIONNAIRE**

----> **FORWARD PROCESSED EoI DATA**

## SOME PROGRESS AND SOME PROBLEMS



### WHO

- \* **DIFFERENT TRANSFER SOFTWARE (IMPACT-ORIENTED)**
- \* **BUILDS LARGELY ON AIRBASE BUT...**
- \* **NEEDS MORE** ----> **COMPLETE EUROAIRNET**
- \* **NOT PUBLICLY ACCESSIBLE**
- \* **HEALTH IMPACT REPORTING**

## CONCLUSIONS

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**LET'S IMPROVE THE OUTPUT AND REDUCE THE EFFORT  
OF COUNTRIES, EEA AND OTHERS**

**LET'S:**

- \* **HARMONISE TRANSFER FORMATS AND PROCEDURES**
- \* **LINE UP DATABASES AND DATA ACCESS**
- \* **MERGE REPORTS AS FAR AS FUNCTIONAL**

**BUT..**

- \* **WE NEED HELP FROM YOU**

#### 4.5. Bert Bannink — The European Environment Reference Centre

### Overview of this presentation

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#### E2RC:

- \* EEA aims...
- \* Main building blocks...
- \* Role of ETC/AQ...
  - \* *Suggested questions for parallel groups*

### EEA aim for E2RC

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**To develop a public information service, recognised throughout Europe as the obvious gateway to easily understandable and efficiently structured environmental information, wherever possible in the user's native language.**

**The Reference Centre will provide seamless access to a wide variety of distributed environmental information, in particular information developed through EIONET.**

## Main building blocks of the E2RC (1 of 2)



### EEA web site:

- o **THE gateway to E2RC**
  - √ EEA organisation & reports
  - √ Entry through themes; links to ETC, NFP, NGO
  - o Multi-lingual search service
  - o Web access to ROD
  - o Major findings and specific issues
- o **Access to data warehouse and topic databases**
  - o Aggregated data in the reporting system
  - √ (GUI) to Airbase
  - o GUI to Waterbase

## Main building blocks of the E2RC (2 of 2)



### EEA web site:

- √ **The directory of EEA/EIONET information resources**
  - √ All EEA/EIONET info resources
  - √ European environmental legislation (~ROD)
- o **Gateway to other information providers**
  - o GELOS –Global environmental locator service
  - o EW –EnviroWindows, IG's
  - o CH CHM –Clearing house mechanism for biodiversity

## Role of (ETC/) AQ in E2RC



### Making Air Quality data (publicly) available

- \* Streamlining EIONET related data flow
- \* Making Airbase data easily accessible
- \* Providing aggregated data to warehouse
- \* Provide access to MDS
- \* ...
- \* (Near real-time information; forecasting?)

## Suggested questions for parallel groups



- |                       |   |
|-----------------------|---|
| * <b>What info:</b>   | * <b>Which target users:</b>              |
| ? Historical data     | ? NRCs                                    |
| ? Episode warnings    | ? MCE                                     |
| ? Near real-time data | ? The general public                      |
| ? Forecasts           | ? Newspapers                              |
| ? ...                 | ? ...                                     |
| * <b>News items:</b>  | * <b>Improved access to AQ-Info, How:</b> |
| ? Recent developments | ? Facilities for reporting & warehouse    |
| ? Reports             | ? Facilities for AQ-themes                |
| ? Newsletters         | ? Facilities per target group             |
| ? ...                 | ? ...                                     |

#### 4.6. Rob Sluyter — Airbase web site

## AIRBASE WEB ACCESS

---

**! QUESTIONNAIRE OUTCOME > USER REQUIREMENTS REPORT**

<i>Extension</i>	UK	BE	SE-1	SE-2	SP	IT	FR	CH	ETC	Av.
Data presentation module, <i>extended queries</i>	4	5	5	5	5	5	5	3	5	4.7
Data presentation module, <i>table output</i>	3	5	5	5	4	5	1	5	3	4.0
Data presentation module, <i>graph output</i>	3	5	5	4	3	5	3	3	4	3.9
Data presentation module, <i>map output</i>	3	2	5	1	3	5	5	5	5	3.8
Meta information presentation module	2	4	5	4	4	2	5	3	4	3.7
Component specific air quality reports	5	3	2	4	5	3	1	5	3	3.4
Mail results to	2	3	3	4	5	1	3	5	3	3.2
Select from clickable maps	3	4	1	3	3	4	1	4	4	3.0
Component specific fact sheets	5	2	3	3	3	3	2	3	2	2.9
Extended mapping	2	2	3	3	3	3	5	2	3	2.9
Generate user defined statistics	2	3	4	3	2	1	3	4	2	2.7
Data transfer status module	5	3	3	2	1	1	1	2	2	2.2
Improve visual appearance	3	2	2	2	1	2	1	1	3	1.9
<i>Average</i>	3.2	3.3	3.5	3.3	3.2	3.0	2.7	3.4	3.36	

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## AIRBASE WEB ACCESS: JAVA APPLET

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**! DEVELOPMENT IN TWO PHASES:**

**! PHASE 1**  
**! OPERATIONAL PROTOTYPE WITH BASIC FUNCTIONALITY IN ORDER TO ESTIMATE DEVELOPMENT COSTS AND TEST TECHNIQUES (JUNE 99)**

**! PHASE 2**  
**! INCLUDE ADDITIONAL FUNCTIONALITY (GUIDED BY USER REQ. AND AVAILABLE FUNDS) (OCTOBER 99)**

Rsl June-99

## AIRBASE JAVA APPLET



- ! DEVELOPED AS PART OF THE IRENIE PROJECT
- ! FUNDED BY DGXIII AND EEA
- ! NEW SERVER: RESPONSE TIME HAS DRAMATICALLY IMPROVED
- ! STATE OF THE ART TECHNOLOGY, REQUIREMENTS:
  - ! PENTIUM II WITH AT LEAST 64 MB RAM
  - ! MS INTERNET EXPLORER 5.X OR NETSCAPE 4.X

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## FUNCTIONALITY COVERED IN PHASE 1



Extension	UK	BE	SE-1	SE-2	SP	IT	FR	CH	ETC-AQ	Average
Data presentation module, <i>extended queries</i>	4	5	5	5	5	5	5	3	5	4.67
Data presentation module, <i>table output</i>	3	5	5	5	4	5	1	5	3	4.00
Data presentation module, <i>graph output</i>	3	5	5	4	3	5	3	3	4	3.89
Data presentation module, <i>map output</i>	3	2	5	1	3	5	5	5	5	3.78
Meta information presentation module	2	4	5	4	4	2	5	3	4	3.67
Component specific air quality reports	5	3	2	4	5	3	1	5	3	3.44
Mail results to	2	3	3	4	5	1	3	5	3	3.22
Select from clickable maps	3	4	1	3	3	4	1	4	4	3.00
Component specific fact sheets	5	2	3	3	3	3	2	3	2	2.89
Extended mapping	2	2	3	3	3	3	5	2	3	2.89
Generate user defined statistics	2	3	4	3	2	1	3	4	2	2.67
Data transfer status module	5	3	3	2	1	1	1	2	2	2.22
Improve visual appearance	3	2	2	2	1	2	1	1	3	1.89
<i>Average</i>	3.2	3.3	3.5	3.3	3.2	3.0	2.7	3.4	3.36	

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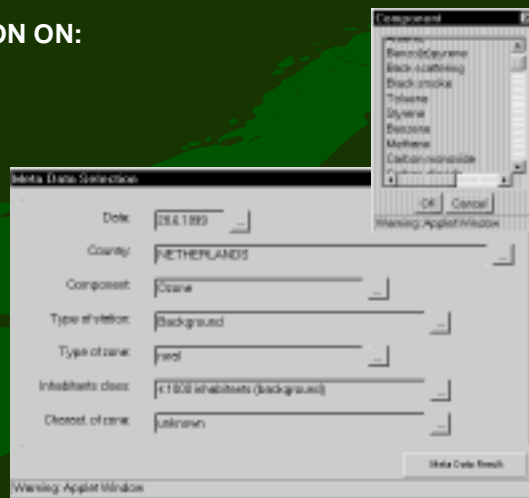


## QUERIES AND META-INFORMATION I



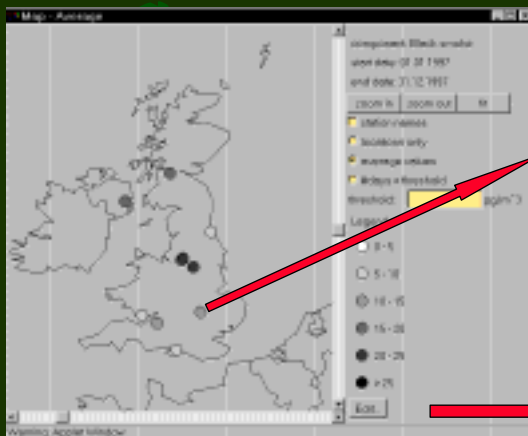
! DYNAMIC SELECTION ON:  
COUNTRY  
POLLUTANT  
POPULATION CLASS  
TYPE OF STATION  
TYPE OF ZONE

↓  
SPREADSHEET  
SELECTED STATIONS  
↓



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## VISUALISATION: MAPS



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## PHASE II EXTENSIONS

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- ! PRE-SELECTION TO SPEED UP INITIALISATION
- ! MESSAGE WINDOWS INDICATING STATUS
- ! HIGH QUALITY GRAPHS AND TABLES
- ! PRINT/SAVE OPTIONS AND ON-LINE HELP
- ! DIRECT LINKS FROM META-INFO MODULES TO VISUALISATION

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## IRENIE COMMON MODULE

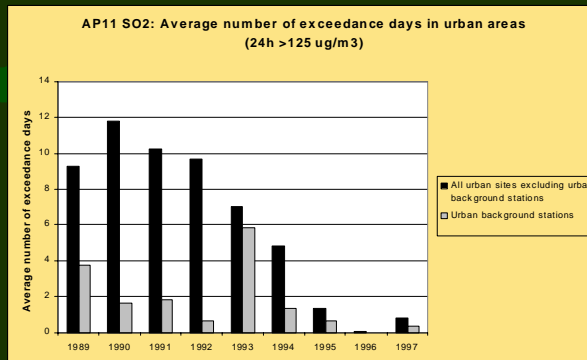
---



- ! GENERIC SOFTWARE (CAN BE USED BY ALL DEMONSTRATORS) TO VISUALISE AQ DATA USING HTML:
  - ! WATERBASE
  - ! AIRBASE
  - ! FREDERIKSTADT/THESSALONIKI
- ! FOCUS ON MAP VISUALISATION USING GIS MAP SERVER

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## DATA USE: INDICATORS



Number of sites	1989	1990	1991	1992	1993	1994	1995	1996	1997
Urban e. backg.	41	9	15	9	18	11	30	26	38
Urban backg.	15	6	6	6	17	23	31	14	57
<b>Total</b>	<b>56</b>	<b>15</b>	<b>21</b>	<b>15</b>	<b>35</b>	<b>34</b>	<b>61</b>	<b>40</b>	<b>95</b>
	6.00	1.83	1.83	1.83	7.63	8.82	11.00	4.11	14.74

Rev June-99

#### 4.7. Roel Van Aalst — Auto Oil 2/GEA assessment

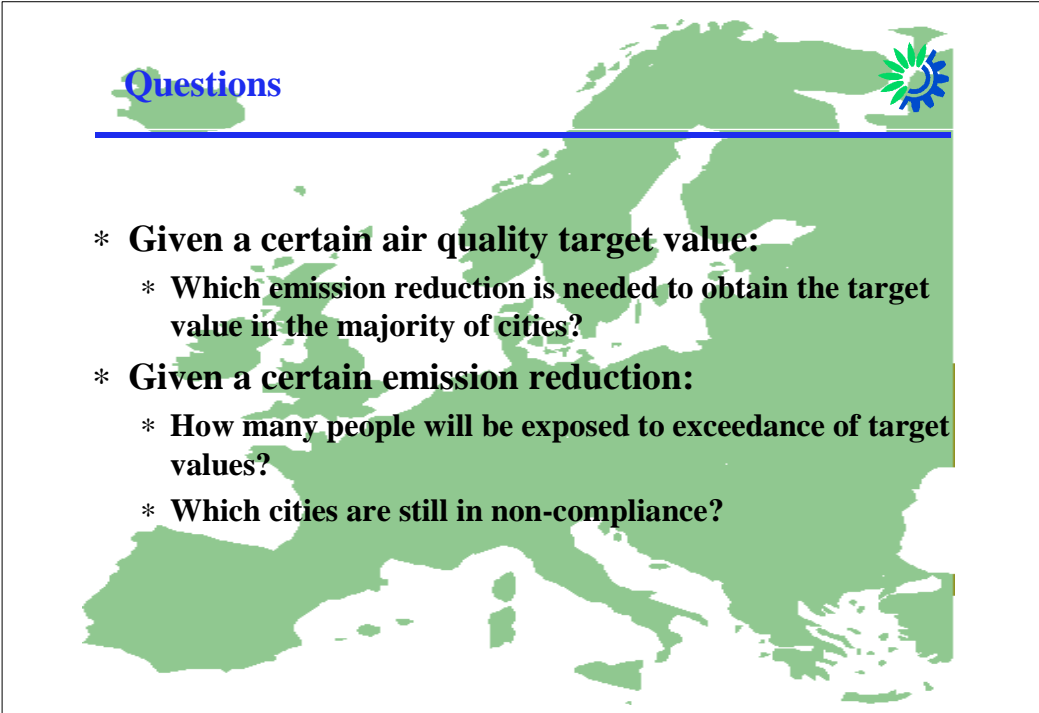


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**AIR QUALITY IN LARGER CONURBATIONS IN  
THE EUROPEAN UNION**

**First interim report**

Frank de Leeuw, Nicolas Moussiopoulos,  
Peter Sahm, Alena Bartenova, (ETC-AQ)  
Tinus Pulles, Antoon Visschedijk (ETC-AEM)



---

**Questions**

- \* **Given a certain air quality target value:**
  - \* Which emission reduction is needed to obtain the target value in the majority of cities?
- \* **Given a certain emission reduction:**
  - \* How many people will be exposed to exceedance of target values?
  - \* Which cities are still in non-compliance?

## **Generalized empirical approach (GEA)**



- \* **Enables generalisation of assessment results to large number of European cities**
- \* **Enables (within EU-15) urban population exposure estimates**
- \* **Includes multi-year meteorological conditions**

## **PURPOSE AND ROLE OF GEA STUDY**



- \* **COMPLEMENTARY TO 10 CITY STUDY:**
  - \* **HELP GENERALISING RESULTS TO LARGER RANGE OF CITIES AND LONGER TIME PERIODS**
  - \* **IMPROVE UNDERSTANDING OF STRENGTHS AND WEAKNESSES IN URBAN AIR QUALITY ASSESSMENT**
  - \* **EMPHASIS ON CONSISTENT AND COMPARABLE INFORMATION RATHER THAN ON STATE-OF-ART SCIENTIFIC RESULTS**

1



## Comparison of methods

### Bottom-up:

*Detailed* results from

- 3-dimensional photo-chemical dispersion model applied to (10) selected cities,
- selected period of time

### Top-down:

*General* results from

- ‘box-plus’ dispersion models applied to cities with local (top-down based) emissions
- under long-term conditions



## GEA: tools

- \* **cQ model: inert species** (NO<sub>x</sub>/NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>)
- \* **Uaqam: inert species** (NO<sub>x</sub>/NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>, benzene, B(a)P, Pb)
- \* **OFIS: ozone**

## The c-Q model



$$* C = C_b + k [Q_{tra} + p (Q_{ind} + Q_{mix})]$$

where :

$C_b$  is the background concentration

$k$  is a city-specific empirical dispersion factor  
precalculated from measurement data

$Q_s$  are emissions from traffic, industry and mixed

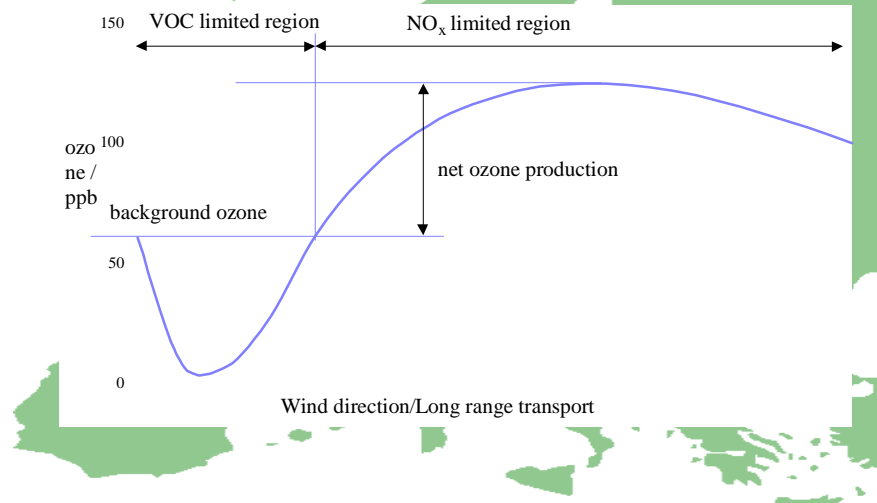
$p$  is the effective ratio between low and elevated sources,  
pre-calculated from a dispersion model

## Ozone fine structure model — OFIS



- \* **Coupled 1D –2D approach:**
- \* **background boundary layer concentrations calculated with a three-layer box model**
- \* **pollutant transport and transformation downwind the city (along the prevailing wind direction) calculated with a three-layer multi-box model**

## OFIS: urban plume



## UAQAM



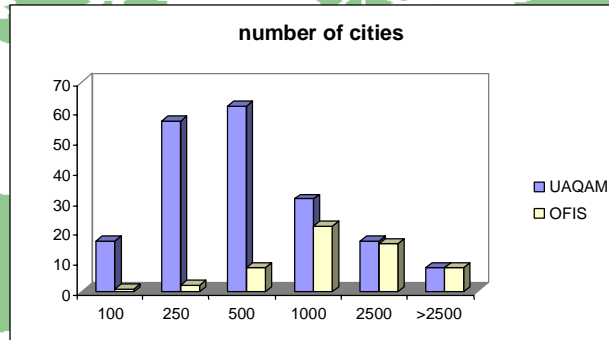
- \* Dispersion model based on basic boundary layer scaling parameters (e.g.  $u^*$ , L)
- \* actual meteo (ECMWF)
- \* three emissions source categories
  - \* traffic
  - \* domestic
  - \* industry



## Selection of cities



- \* All cities > 250 000 inhabitants
- \* plus smaller cities with reliable monitoring data
- \* population data from UN Statistical Division

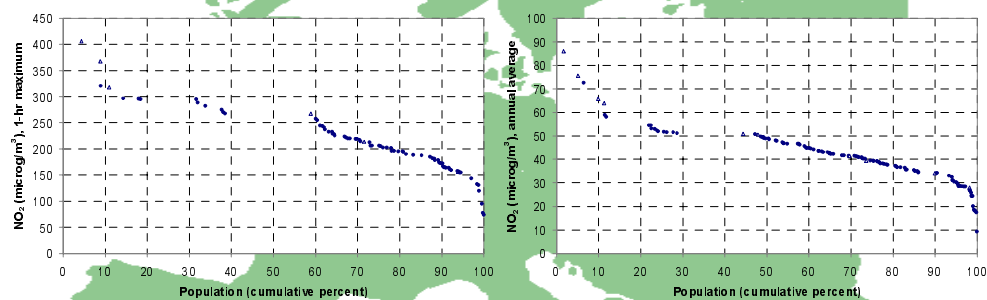


## Selection of cities



Country	total	urban	selected	%
Austria	8045	5176	2332	45
Belgium	10128	9823	2763	28
Denmark	5224	4451	2043	46
Finland	5106	3225	1268	39
France	58103	43385	21368	49
Germany	81594	70575	21272	30
Greece	10453	6193	3822	62
Ireland	3546	2039	916	45
Italy	57205	38113	11020	29
Luxembourg	407	363	76	21
Netherlands	15482	13775	5034	37
Portugal	9815	3493	2936	84
Spain	39627	30297	11030	36
Sweden	8788	7303	2111	29
United Kingdom	58079	51821	24624	48
<b>EU-15</b>	<b>371602</b>	<b>290032</b>	<b>112614</b>	<b>39</b>

## Cumulative distribution of NO<sub>2</sub>

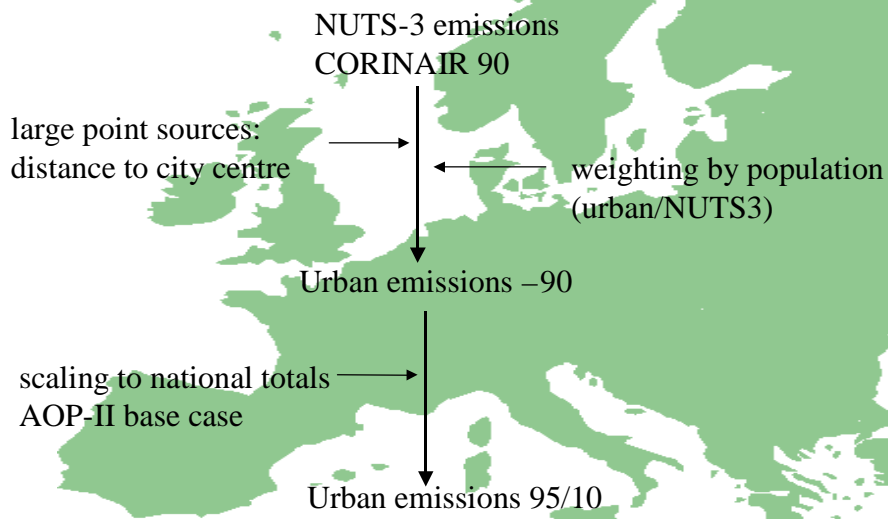


## Urban emissions: top-down approach

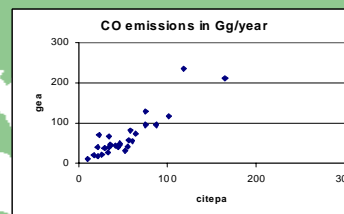
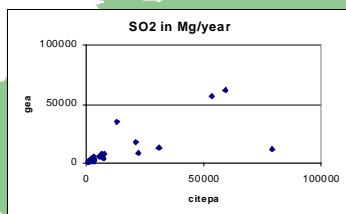
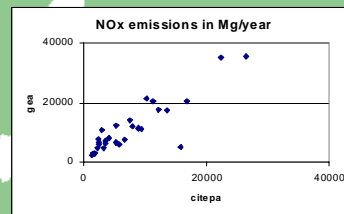
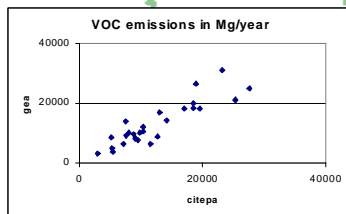


- \* **Procedure: Topic report 30 -1996, ETC/AE**
  - \* **point sources: depending on distance to city centre and urban area**
  - \* **surface source: scaling of NUTS<sub>3</sub> emissions**
  - \* **no emissions from agriculture or nature**
- \* **major problem: validation**

## Urban emissions: top-down approach



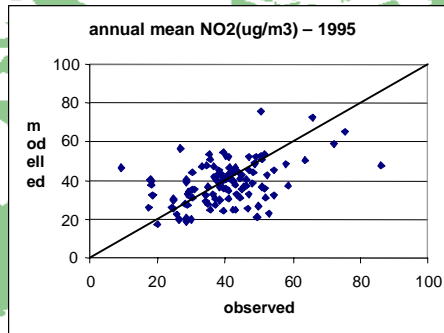
## Urban emissions: comparison CITEPA



## NO<sub>2</sub>: 1995



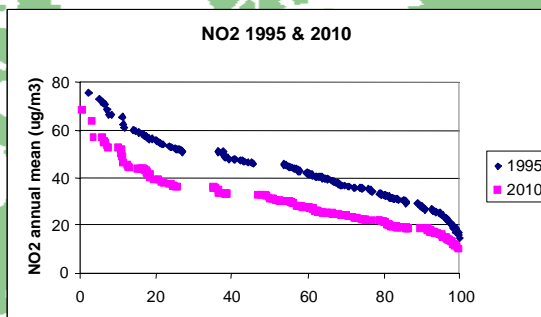
- \* Objective: <math>< 18 \text{ times } 200 \mu\text{g}/\text{m}^3 \text{ (1h)}</math>; <math>< 40 \mu\text{g}/\text{m}^3 \text{ (annual)}</math>
- \* annual: 65%, hourly 11% of population



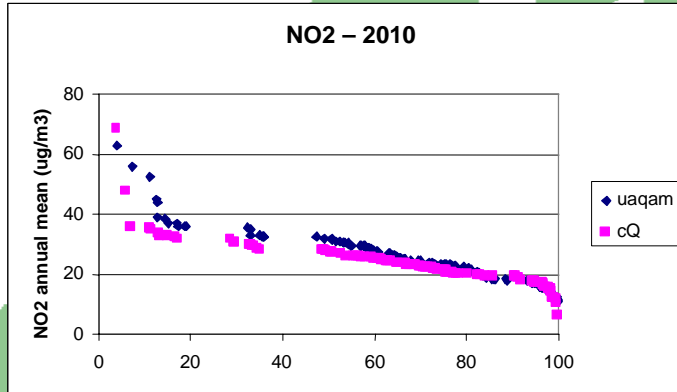
## NO<sub>2</sub>: 2010



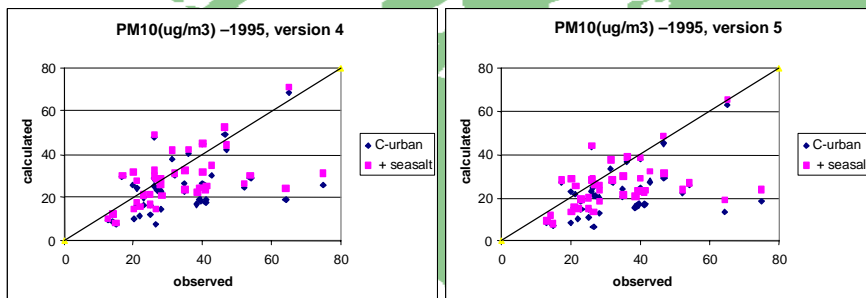
- \* Objectives non-attainment for:
  - \* annual: 19% of population
  - \* hourly: one – two cities



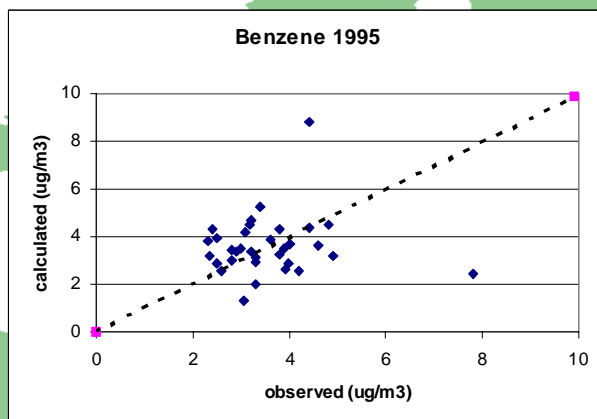
## NO<sub>2</sub>: cQ vs. Uaqam; 2010



## PM<sub>10</sub>: 1995



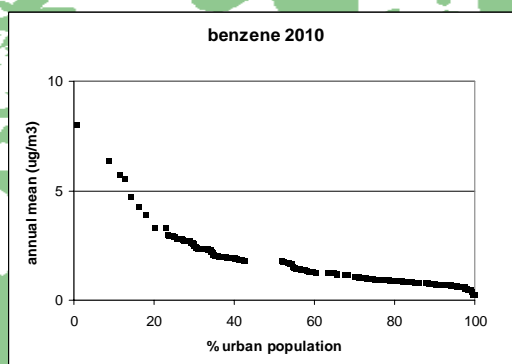
## Benzene: 1995



## Benzene: 2010



- \* Objective: annual mean  $< 5 \mu\text{g}/\text{m}^3$
- \* 13% of population



## Summary



### Fraction of urban population in non-attainment cities

pollutant	averaging period	1995 (a)	2010(b)
SO2	1 hour	23%	2%; 3-6%
SO2	24 hours	25%	7%; 9-11%
NO2	1 hour	5%	5%; 0%
NO2	calendar year	65%	5%; 20%
pm10	24 hours	87%	62%; 73%
pm10	calendar year	89%	62%; 52%
CO	8 hours	14%	0.5-1.5%
O3	daily 8-h max	48%	6%
benzene	calendar year	50%	13%
Pb	calendar year	23%	0%
B(a)P	calendar year	(~100%)	(??)

# Appendix 1: Programme

European Topic Centre on air quality (ETC/AQ)  
RIVM — NILU — NOA — DNMI

## Fourth EIONET workshop on air quality management and assessment

*At Nomikos Conference Centre  
Santorini, Greece, 23–24 September, 1999*

### Final programme

Thursday 23 September 1999

**09:00–09:15: Introduction: Welcome; scope and goal of the workshop**

**09:15–09:45 Session I: Air quality information as a basis for AQ policy:  
How did we use your data?**

*Overview of ETC/PTL/AQ products and assessments  
(Europe's environment at the turn of the century, Yearly indicator report, the  
Auto Oil 2 programme/ generalised empirical approach, EC working groups,  
Exchange of information/ozone reporting). Dick van den Hout, ETC/AQ/RIVM*

Background papers:  
Annual topic update 1998  
Short status report summarising recent (draft) reports

**09:45–11:30 Session II: Air quality networks, data and reporting (flow from NRC to  
ETC)**

Introduction:  
09:45–10:15 Status of Euroairnet, and plans for further development.  
*Steinar Larssen, NILU/ETC/AQ*  
10:15–10:45 Status of Airbase and reporting tools (DEM), and plans for further  
development. *Rob Sluyter, RIVM/ETC/AQ*  
10:45–11:00 Coffee break  
11:00–11:15 Harmonisation of international AQ data collection.  
*Roel Van Aalst, EEA*



11:15–11:30 Continued integration of Phare countries reporting into the EC exchange of information/ozone reporting.  
*Libor Cernikovski, CHMI/PTL/AQ*

Background papers/web information:  
Euroairnet criteria and status reports  
Airbase '99 status + development report,  
DEM v2 specifications  
Note on reporting procedures to EMEP, OECD, WHO

11:30–12:30 Discussion (parallel groups):  
Is Euroairnet developing into a 'representative network with sufficient coverage and quality'?  
What are priorities for its improvement and further development (Stage 2)?  
How can we make Airbase more complete and relevant?  
Are the reporting tools (DEM v2) appropriate?  
Can we take advantage of national reporting procedures?  
Conversely, have you used DEM concepts in your regional-to-national reporting?  
How can NRCs help the ETC to remove duplication and improve harmonisation in data reporting?

12:30–14:00 Lunch

14:00–15:15 Discussion (continuation)

15:15–15:30 Coffee break

15:30–17:00 Reporting back in plenary. Plenary discussion

### 19:00 Reception

## Friday 24 September 1999

### 08:30–09:30 *Session III: Access to information (flow from EEA/ETC to NRC/EIONET)*

08:30–09:00 Introduction:  
European Environment Reference Centre (E2RC) — Air.  
*Bert Bannink, RIVM/ETC/AQ*

09:00–09:30 The extended web site access facilities to Airbase.  
*Rob Sluyter, RIVM/ETC/AQ*

*Background:*  
Description of and further plans for E2RC  
Description of access to Airbase, including Irenie software

09:30–09:50 Coffee break

- 09:50–11:30 Discussion (in parallel groups):  
What information should be on the E2RC — Air  
(historical data? Near-real time data? Episode warnings/forecasts?  
News and recent developments? Reports? Newsletters?)  
What should be the target user group? (NRCs? MCE? General  
public? Newspapers?)  
How can we further improve access to Airbase?
- 11:30–12:30 Reporting back in plenary. Plenary discussion
- 12:30–14:00 Lunch

**14:00–16:15 *Session IV: Urban air quality assessment and management***

- 14:00–15:35 Introduction:  
On recent developments on urban air quality assessment and  
management: methodologies and tools.  
*Roel Van Aalst, EEA*  
Based upon ETC work in Auto Oil 2 programme (the GEA  
assessment), and the work in the Eurotrac 2/Saturn subproject
- European air quality data for health impact assessment. A view from  
WHO.  
*Kees Huijsmans, WHO ECEH.*
- Background paper from ETC:  
Auto Oil 2 programme/general empirical approach (GEA) draft  
report
- 15:35–16:15 Discussion:  
Management and assessment of urban air quality at the European,  
national and local level.

**16:15–17:00 *Summary of main conclusions, and key recommendations***

Presentation and discussion in plenary

***Demonstrations:***

During the workshop, a PC with Internet connection will enable to explore the present status of access to air quality data and information from EEA and ETC/AQ.  
We will also attempt to arrange a demonstration of various air quality management software tools, as was demonstrated at the Saturn workshop in Aveiro in August 1999.

## Appendix 2: List of participants fourth EIONET workshop on air quality monitoring and assessment

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