

European Topic Centre on Air Quality

ANNUAL SUMMARY REPORT 1995

By

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Note

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ORGANISATION

The European Topic Centre on Air Quality (ETC-AQ) consists of four institutes:

- National Institute of Public Health and the Environment (RIVM), Bilthoven, the Netherlands (lead institute)
- Norwegian Institute for Air Research (NILU), Kjeller, Norway
- National Observatory of Athens (NOA), Athens, Greece
- Norwegian Meteorological Institute (DNMI), Oslo-Blindern, Norway

NOA was supported by the University of Athens and the University of Thessaloniki.

The project leader was Roel M. van Aalst (RIVM). The deputy project leader was Harald Dovland (NILU) until 25 September; after Mr. Dovlands resignation as director of NILU, Steinar Larssen (NILU) was deputy project leader.

The project leader was supported by a Steering Group consisting of the contact persons for the participating institutes (mostly the institute Directors) seconded by their deputies in ETC matters. The Steering Group had meetings in December 1994, April and May 1995, in which the planning and progress of the work and the plans for future work were discussed and endorsed. The work on each of the 13 tasks, as defined in the work plan, was carried out by task teams composed of team members from different institutes, lead by a task leader who was responsible for the task and its deliverables. Task team meetings were scarce. Two plenary project meetings were held, in January in Bilthoven, the Netherlands, and in September in Porto Carras, Greece.

The relatively simple organisational structure worked satisfactory. Experience from the task teams and the plenary meetings indicated that, next to the contacts via mail, telephone and e-mail, personal and informal contacts are essential for effective work. Task team meetings will be stimulated in future. The project leader communicated frequently (almost daily) with the EEA Programme Manager.

Work programme, work plan and progress reporting

The work programme is described in the EEA Annual Work Programme mid-1994 to 1995, under Programme 4, Media-oriented monitoring, in the following three projects:

- MA1: Air quality, general approach to assessment
- MA2: Establishment and maintenance of the European air quality monitoring network and databases
- MA3: Harmonisation in the use of models for ambient air quality and pollution dispersion/transport

The work programme and the deliverables were described in the technical annex of the contract, as defined by EEA on the basis of the EEA Work Programme, using the proposal by the ETC consortium and in consultation with the project leader.

More or less simultaneously, a detailed work plan was worked out by the ETC in which tasks were defined, results and deliverables described, task teams and task leaders identified, and time planning provided.

Progress was reported to EEA in four quarterly reports, based on information from the task leaders and on managerial and financial information from the institute contact persons.

This helped to signal deviations from the work plan and from the financial planning. Although there was sometimes substantial delay in the work with respect to the planning, almost all of the planned results, and some more, had been produced by the end of the first year.

In July, the ETC produced a proposed working programme 1996-1997, which served as a basis for development of the contract under the 1995 subvention. The programme as proposed extends beyond the projects MA1, MA2 and MA3, including support for the Periodic Reporting and Integrated Assessment programmes of the Agency. Moreover, enhanced ad-hoc support, particularly to the EC Directorate-General XI (DGXI) and WHO-ECEH, the World Health Organization European Centre on Environment and Health, was proposed.

RESULTS AND PRODUCTS IN 1995

Results and products, together with some of the working methods and working experience, are listed and discussed below. Reports and products are indicated in bold.

Project MA1: Air quality, general approach to assessment

In a number of meetings, tasks and responsibilities of the ETC-AQ in relation to those of DGXI and the EC Joint Research Center (JRC-ISPRA) were discussed in order to avoid any duplication. It was agreed that the ETC tasks should concentrate on air quality assessment, which is wider than developing, implementing and enforcement of air quality legislation, for which EEA has no responsibility. DGXI is seen as an important client to the ETC. The ETC welcomes collaboration with JRC, particularly in evaluation of measuring methods and equipment and quality assurance, but also in fields such as remote sensing and modelling.

Needs and requirements for air quality information were reviewed from European assessment reports, such as the Dobris report and from international conventions and agreements. Needs and requirements for air quality monitoring were collected by sending in February a questionnaire to 38 European countries. A first report on the basis of then available information was submitted to EEA by April 1; as results kept coming in, the final report **"Requirements and needs on European air quality information"** was delivered early December. An important theme in the report is the need to relate air quality to sources and effects as a basis for solutions and a sector/source oriented policy. This leads to a definition of assessment which extends beyond the mere determination of air quality levels and includes the causal chain. Requirements for air quality monitoring in the European countries extend even beyond the 37 compounds currently proposed to be considered under the draft Exchange of Information Decision and relate to all spatial scales: local/urban, regional and global.

In order to investigate and inventorise current monitoring practices in Europe, a questionnaire was sent to 38 European countries and information was obtained from responses from 19 countries, and national reports, in total from 29 countries. Advantage was taken from the available CEC databases APIS and GIRAFE and there was good collaboration with the WHO Collaborating Centre for Air Quality Management and Air Pollution Control at UBA, Berlin. The information was presented in the report **"Report on state of the air pollution monitoring situation in Europe - problems and trends"** in the form of country network description tables, country summaries and European summary tables. Although coverage of air quality monitoring stations is impressive, with some 5000 urban/local stations, and more than 750 stations for regional monitoring, coverage is not sufficient for a number of compounds considered (lead, ozone, ozone precursors). In spite of availability of national air quality reports, comparison of air quality between countries is not easy due to lack of harmonisation. Some countries make air quality information directly available to the general public.

The final product of this project is a report **"Recommendations for an assessment approach at the European level"**. On the basis of the needs and requirements as assessed in this project and elsewhere, this report should develop the concept of information on air quality according to the EEA goal to produce "objective, reliable and

comparable information for support of those framing, implementing and further developing European environmental policy, and for the wider European public". This calls for a broad definition of the concept of air quality assessment and for an analysis of the air pollution problems directed towards actors and sectors, in line of the principles of the EC fifth Environmental Action Programme. In view of the need to discuss these general recommendations first with member states, the report is concise and does not yet provide technical recommendations. It is foreseen that these recommendations will be discussed with the EIONET partners on a workshop scheduled in spring 1996.

Project MA2 : Establishment and maintenance of the European air quality monitoring network and databases

One of the first steps was evaluating the use of the current EC information systems for air quality APIS and GIRAFE. The APIS system, developed by DGXI to support the Exchange of Information Council Decision, contains air quality data, while the GIRAFE system, developed independently, has been used to provide information on monitoring stations and measuring procedures. A questionnaire to users of these systems in the EU member states revealed that APIS is a reasonably sound system with essential information, and clear, but limited applications. However, the number of users turned out to be small.

The GIRAFE system was used even less and contained a large number of errors and imperfections. In the report **“Review of current database systems APIS and GIRAFE for air quality and monitoring stations”** the recommendation was made to combine the information in both systems, to enable selection of air quality data from certain types of stations.

In a second step, views from data providers and international air quality information managers were sought. The response to a questionnaire sent was disappointing. An internal ETC report **“Evaluation of experience on EU Exchange of Information and other international air quality data collection”** has been produced, the results of which have been incorporated on a later report on maintenance and development of air quality data bases.

In the meantime, the ETC had an preliminary study carried out by a consultant. In the resulting report **“Preliminary study AIRBASE for the European Topic Centre on Air Quality”**, system requirements for an air quality information system meeting the needs and requirements of a variety of potential clients were developed, building on the experiences in the previous reports and those in other air quality information systems. A system concept was developed that provided a combination of centralised and decentralised approaches, and should serve the needs of a variety of users at three different levels of access and detail. Discussion with member states and other topic centres, and in the EEA’s ITTAG group provided positive reactions.

In the report **“Report on maintenance and development of air quality databases”** the findings and proposals were summarised. The objective of the proposed air quality information system will be: “offering the facilities needed to collect, validate, evaluate, integrate and store air quality (-related) data from and (meta-) information about air quality monitoring networks and stations, and making these data available on different

(aggregated) levels for different information users and through different distribution channels”.

Part of the maintenance of the current information systems was **the update of APIS and GIRAFE**. On request of DGXI and EEA, the 17 member countries of EEA provided recent air quality data (1993/1994) and some updated station information to the ETC via DGXI. The ETC sub-contracted a software house to transform the data, which came in different formats, and to insert them in the data base. The updated database was made available to the EU Air Quality Directive Working Groups and will be made available on CD-ROM to all member states and other interested parties.

The updated databases, supplemented by information from national air quality reports, the information provided to the Commission in the framework of the Ozone Directive, and information from EMEP, served as the basis to produce the pilot report "**Air Quality in Europe, 1993**". This report provides an overview on seven air pollution compounds, for which emissions and concentrations on local/urban and regional scales and their trends are depicted in maps, graphs and tables. Although the information is incomplete (data were available from 17 European countries) the data show that EU limit values for SO₂ and black smoke are still exceeded in some European cities and that EU and WHO guide values are exceeded extensively for a number of compounds, including ozone, NO₂, SO₂ and particulates.

A major difficulty in judging the coverage and adequacy of the networks in Europe is the evaluation of quality and representativeness of the measurements. In the report "**First evaluation of the quality and representativeness of monitoring networks and stations**" an attempt has been made to address this problem. The report describes how quality and representativeness should be assessed, in relation to the goals of the network. An attempt has been made to determine these characteristics from the information in GIRAFE on station siting and measuring procedures. A prominent conclusion is that quantitative quality documentation cannot be derived from GIRAFE. It is recommended to provide explicitly an estimate of measurement quality in the field and a quantitative estimate of the area of representativeness within a specified margin of uncertainty.

Participation in QA programmes and laboratory accreditation are important for ensuring and improving quality. Further development of a co-ordinated quality assurance plan for European measurements is necessary.

A first attempt towards such a QA plan is provided in the ETC report "**A common minimum quality assurance program**" that has been delivered to EEA and is presently being discussed with the EC Joint Research Centre (JRC-ISPRA). Originally, it was intended to produce this as part of a more comprehensive report in which more detailed requirements for air quality monitoring at the European level were to be provided. This report should have been presented at a workshop for all EEA member states in December 1995. This time schedule turned out to be too ambitious and, moreover, there was some potential interference with the work in the EC Air Quality Directive Working Groups, which addressed these problems in relation to the Directives in their meetings in January 1996. The workshop will now be organised by the ETC in spring 1996.

Project MA3 : Harmonisation in the use of models for ambient air quality and pollution dispersion /transport

The first activity was a review of model requirements and model applications in EEA, international organisations and European countries. In the report: **“Review on requirements for models and model applications”** results were obtained from reviewing the Dobris assessment report and practice in EC legislation, international organisations, such as EMEP and the marine conventions, and from 37 responses from 28 European countries to a questionnaire sent to 38 countries. Model applications are frequently used for regulatory and general assessment purposes by various users (scientists, air quality managers, policy makers). Forecast models may play an important role in providing timely information to the public in case of smog episodes. While requirements in terms of compounds and spatial and time scales can be provided, there is not much information on requirements on accuracy. There is an urgent need for harmonisation and improved documentation for a relevant selection of the many available models. Combination of air pollution models with models for other compartments (water, soil) is also becoming more and more important.

As air pollution models integrate and interrelate the information from emission inventories and air quality monitoring results, close coordination between the Topic Centres on Air Quality and Air Emissions in air quality assessments is essential.

In the report **“Models for ambient air quality and pollutant dispersion/transport - State of the art, needs and trends”**, an overview is provided of air pollution models currently in use in Europe, on scales ranging from global to local. Models are important tools, not only for assessing emission reduction strategies, but also for estimating exposure and investigating economic aspects. Many models are available for most of the applications where they might be of use. Clear guidelines for model documentation are hardly available. More attention is needed for the accuracy of the model output, as related to model inputs and model formulation and to model evaluation and validation. There is a need for multi-scale models and for better experimental data for model evaluation.

Work has been in progress to develop a model documentation centre and toolkits for testing relevant models. A functional design of an information system for models has been set up and it is intended to realise the system on the World Wide Web.

The work on this centre and the evaluation toolkit proceeds in close collaboration with the European ad-hoc Initiative for harmonisation of atmospheric dispersion modelling.

Work has also proceeded towards development of guidance reports on the selection and application of models. Two such guidance reports are being prepared by the ETC for distribution in 1996:

- Selection of models and input data for groups of applications
- Model applications in the assessment of urban air quality

AD-HOC SUPPORT INCLUDING INTERACTION WITH INTERNATIONAL ORGANISATIONS

The ETC participated actively in various EC working groups, such as the Expert Group on Photochemical Air Pollution and in four Air Quality Directive Working Groups under the new Air Quality Framework Directive. In these four groups, the ETC, together with JRC-ISPRA, has been given the task of helping to ensure quality and consistency of the position papers to be produced and to provide information for Europe as a whole. The ETC has also contributed to an EC working group on network design. The ETC has participated in two conferences organised by EC-DGXI during 1995.

On request of DGXI to help prepare the Commission's report to the Environment Council, the ETC has prepared the report **“Exceedance of ozone threshold values in the European Community in 1994”**, on the basis of data that had been submitted by Member States in the framework of the Ozone Directive. From the report, it is evident that all threshold values set under EC legislation are exceeded, some of these frequently, largely and over major parts of EU territory. Recommendations are made in the report to improve data exchange.

The ETC supported the Agency in the review of the EC fifth Environmental Action Programme, by reviewing chapters related to air pollution and providing additional information.

Good collaboration developed with the WHO European Centre for Environment and Health in Bilthoven, which repeatedly expressed strong interest in the ETC work on air quality and participated in proposals to EEA to collaborate on exposure assessments. The ETC participated in a meeting organised by WHO-ECEH in Sosnowiec, Poland, where information exchange with Eastern European countries relevant to Environmental Impact Assessment was discussed.

The ETC has good relations with EMEP and the UN-Convention LRTAP, as the European Co-ordinating centres of EMEP are partners in the ETC. The ETC represented the EEA at the EMEP Steering Body. Relations have also been established with WMO and with WHO/UNEP GEMS-AIR.

The ETC has played an active role in the EUROTRAC programme. The ETC participated in an informal group, preparing for the formation of an Environmental Assessment Group in the possible future EUROTRAC-2 programme and participated in a seminar on abatement strategies organised by EUROTRAC.

SUMMARY OF REPORTS AND OTHER PRODUCTS IN 1995

- Requirements and needs on European air quality information
- Report on state of the air pollution monitoring situation in Europe - problems and trend
- Recommendations for an assessment approach at the European level
- Review of current database systems APIS and GIRAFE for air quality and monitoring stations
- Evaluation of experience on EU Exchange of Information and other international air quality data collection
- Preliminary study AIRBASE for the European Topic Centre on Air Quality
- Report on maintenance and development of air quality databases
- Update of APIS and GIRAFE databases
- Exceedance of ozone threshold values in the European Community in 1994
- Air Quality in Europe, 1993
- First evaluation of the quality and representativeness of monitoring networks and stations
- A common minimum quality assurance program
- Review on requirements for models and model applications
- Ambient air quality, pollutant dispersion and transport models.

These reports were delivered in draft by the ETC during 1995 and will be finalised with National Focal Points and other technical experts prior to publication by the Agency during 1996.

MAJOR CHALLENGES AHEAD

From the work so far, many recommendations can be derived, which will not be presented in detail here. However, some major points to note are:

- The ETC will further develop its relations with major users of the information that we produce, such as DGXI and member states. We seek more interaction with them to learn about their needs and to get synchronised with the political agenda, so that we can deliver the most relevant products at the right time. We will prepare and distribute newsletters, organise workshops and have more informal interaction.
- Our principle target should be the preparation of air quality assessments, which contain information directly useful for development and implementation of environmental policy. This should imply that we relate air quality to sources and economic sectors; consequently, close collaboration with the ETC-AEM is essential. One important product ahead is the next European air quality report, now scheduled early 1997. We have proposed to combine the most recent air emission and air quality data in this report.
- In order to enhance the quality and cost-effectiveness of our assessments, we have to continue in improving and optimising the infrastructure that exists in Europe in monitoring, modelling and information systems. In view of the enormous amount of work potentially related to these aspects, it is of importance to the EEA and to European countries to produce the maximum of information at a minimum of effort and costs and to rationalise infrastructure.
- The ETC aims at providing all necessary air quality information that the EEA needs, to support the tasks of the Agency, not only in Media-oriented Monitoring, but also in Integrated Assessment, Periodic Reporting and other EEA programmes. Of course, this implies collaboration with the EIONET partners, particularly other ETC's.
- We aim at expanding our relations with WHO and other international organisations to improve air quality information for assessment of effects on health and ecosystems related to air pollution.
- We aim at maintaining a pan-European approach, in close co-ordination with the work of ETC-AEM and we aim at collaboration with the PHARE Programme to intensify our relations with other European countries.

MEETINGS IN 1994/1995

Date(s)/venue	Title	Participants	Goals
20 December 94 (telephonic)	Steering Group	steering group	Set up project organisation, project infrastructure and quality system
23-24 January Bilthoven	ETC Project meeting	project team	Discuss and complete the work programme 1995; build a team
6 February München	EUROTRAC-EMEP-EEA	project leader, Dovland, Eliassen	Define interactions between phase 2 of EUROTRAC, EMEP and EEA
10 February Brussels	EEA- DGXI- DGXII-ERLAP	project leader, McInnes	Delineate tasks and responsibilities, communicate and co-ordinate work plans (as far as ETC is concerned) present and discuss ETC work programme
20 February Copenhagen	EEA-NFP meeting	project leader	Progress and implementation; work programme 1996-1997
13 March Brussels	Ozone Directive experts	project leader	Discuss implementation of Ozone Directive. Organised by DGXI
14 March Brussels	Network design CEC DGXI	project leader	Discuss AQ network design to support Framework Directive; prepare background paper
4-6 April Brussels	DGXII workshop AQ standards	project leader, McInnes	Discussion of technical aspects of setting air quality objectives
24 April Ispra	JRC / ETC-AQ	steering group	AQ Set up co-operation between JRC-ERLAP and ETC-
25 April Ispra	ETC Steering Group	steering group	Progress and implementation; work programme 1996-1997
26 April Geneva	EMEP Bureau meeting	project leader	Co-operation between EMEP and EMA and presentation of EEA and ETC-AQ
26 April Valencia	Inauguration EUPHORE	project leader	Representing EEA on request of Executive Director
27 April Valencia	Oxidation processes in troposphere	project leader	Review results and applications of smog chamber research
3 May Ispra	Task MA3-2 meeting	task team	Further definition of task and task report
5 May Brussels	DGXII/DGXIII cult. herit.	dep. proj. leader	Establish co-operation in research on cultural inheritance damage
11 May Copenhagen	EEA Management Board	project leader	Presentation on Topic Centre on Air Quality
12 May Brussels	DGXII network design	project leader	Discuss air quality network design to support Framework Directive
15 May Copenhagen	Steering group	steering group	Discuss outline work programme 1996-1997 of ETC-AQ
15 May Copenhagen	EEA-EMEP-EUROTRAC	project leader, Dovland, Eliassen	Meeting between EUROTRAC, EEA and EMEP on future co-operation
29-30 May Ispra	DGXII ozone measuring strategy	project leader	Outline principles for ozone meas. strategy; defining new group mandate
12 June Bad Boll	DGXII photoox. expert meeting	project leader	Review implementation of ozone Directive and progress of ongoing work
22 June Copenhagen	Integrated Env Assessment	project leader	Discuss EEA strategy and methodology for IEA
23 June Copenhagen	EEA National Focal Points	project leader	Discuss work programme 1996/1997 (ETC presentations); and other items
27 June Copenhagen	ETC-ITTAG meeting	C. Potma	Review IT and telematics aspects of EEA WP and devel. of pilot applications
28-29 June Gothenburg	Research and Abatement Strategies	project leader	Review and discuss research and abatement strategies for ozone and acidification
5 July Brussels	DGXII Framework Directive	project leader, McInnes	Discuss composition, work and time schedule Working Groups position papers
7 August Brussels	APIS/GIRAFE update	Sluyter	Discuss progress in updating APIS/GIRAFE
31 August Brussels	DGXII/JRC/ETC on Directives	Project leader	Discuss role of ETC and JRC in Working Groups daughter directive position papers
4 September Copenhagen	Follow-up Committee ETC-AQ	project leader	Evaluate progress and plans of ETC's AQ and AEM
4-6 September Geneva	EMEP Steering Body	project leader, Dovland, Eliassen	Represent EEA ETC's AQ and AEM
25 September Porto Carras	Project meeting ETC-AQ	task leaders	Discuss progress, future plans; enhance team building
26-27 September Porto Carras	Air Pollution 95 congress	several members	Keep up with AQ science
12- 13 October Copenhagen	Working Group on NO2	project leader	Draft position paper supporting Daughter Directive for NO2
19-20 October London	Working Group on Particulates	Larssen	Draft position paper supporting Daughter Directive for particulates
23-25 October Brussels	Congress on AQ in European Cities	project leader, Larssen, Sluyter, McInnes	Review and discuss problems and solutions in urban air quality
26-27 October Copenhagen	ITTAG Application Group	Mol	Discuss progress in EIONET networks and telematics
6 November Brussels	Working Group on SO2	project leader	Draft position paper supporting Daughter Directive for SO2
9-10 November Copenhagen	EEA National Focal Points	project leader	Discuss progress and EEA 1996 Work Programme
20-22 November Sosnowiec	WHO seminar on indicators	project leader	Agree with CEE countries on data exchange and meth. for health impact assessment