COST ACTION 633
Particulate Matter:
Properties Related to Health Effects

International conference

universität wien

Similarities and differences in airborne particulate matter, exposure and health effects over Europe

"Five interactive workshops"

April 3 to 5, 2006,
Austrian Academy of Sciences, Vienna, Austria

Dr. Ignaz Seipel Platz 2, A-1010 Vienna

About COST 633

Atmospheric particles or dust (particulate matter, PM) have been always considered a major component of air pollution. Epidemiological studies in the recent years gave a strong hint on extended morbidity and mortality even due to relatively low PM burdens (e.g. Dockery et al, 1993).

The understanding of the corresponding causal chains of various parameters describing PM exposure and the health effects is still very weak. Many research projects on PM-exposure and health related effects due to particles have been initiated in the last years, mainly in the United States but also in Europe and other areas of the world. Consequently, ambient air quality standards for particulate matter are being established or revised in many countries. Several workshops on research priorities within this field (EU, USEPA, HEI) indicated extensive needs for additional information.

In many European as well as other countries extensive monitoring programs focus on PM and special parameters like carbon, acidity, semivolatile components, ultrafine particles and so on. The research goals of these studies are not always the same in detail, but generally particle properties with respect to effects on the environment and in particular on human health are addressed. Furthermore, epidemiological studies focused on different health endpoints and high risk groups are conducted.

Since most of these studies are being done independently at present, intensive exchange of experiences among the participating groups from the exposure as well as from the effects research side would be of great benefit to all participants. A harmonisation of the results available is highly desirable. Therefore, the COST 633 Action is to co-ordinate and promote the research going on in Europe on these issues.

Objectives:

1. To increase the information on the particulate matter (PM) characteristics throughout Europe, describing the PM-system with respect to geographical and meteorological conditions, particle formation processes and their transport with special regard to the European aerosol situation (compared e. g. to the US).
2. To increase the information on health effects of PM throughout Europe with special regard to geographical, seasonal and source-related aspects.
3. Improve the scientific basis for setting environmental standards in Europe and for defining cost-effective abatement measures to reduce particle and particle precursor emissions.

COST 633 will reach these objectives by bringing together scientists working in diverse fields (atmospheric PM system and measurements, epidemiology, toxicology and modelling) to a multidisciplinary expert group. Three working groups were instituted to work on the tasks (See separate pages). The focus of the workshop is the summary and analysis of existing airborne particle datasets and health effect related information in view of similarities and differences within Europe. This workshop will facilitate a pan-European transdisciplinary approach to

- Combine information of particle composition, size, and morphology, (personal) exposure, epidemiology and toxicological effects of particles.
- Identify short- and long-term future needs within the above research areas

AIM OF THE MEETING

Five interactive workshops will show the status quo on currently available information related to the below listed topics and whether this information already allows statements related to European similarities and differences on health effects caused by particulate matter.

One major outcome of the conference shall be recommendations of specific research needs, a strategy on how Europe-wide information can be obtained and a general concept of how this information shall be analysed and combined. The conference aims to develop recommendations for future research efforts on similarities and differences in airborne particulate matter, exposure and health effects over Europe in a sequence of interactive general sessions and breakout workshops on the following five topics.

1. Is it possible to cluster regions showing strong similarities related to particle characteristics?
2. Can PM sources be clearly differentiated?
3. What are the differences in the exposure of the European population?
4. Do particle characteristics explain heterogeneities of health effects in European populations?
5. Do toxicological studies provide plausibility and causal proof of epidemiology-based associations between health effects and PM?

For each topic distinguished experts will give a short introduction into the current state-of-the-art knowledge. Breakout sessions will develop recommend-ations in open and structured discussions. Recommendations will be reported to the audience of the workshop in order to create a link between the five topics. Refined recommendations will be written up by the session chairs and their rapporteurs.
This in turn will be presented at the last day of the meeting to stakeholders including regional and national policymakers but also to the press. The outcome of these five interactive workshops can also be used to refine the EU research agenda.

PROGRAMME

Monday 3rd April:

8:00	9:00	Registration
9:00		Official opening – Regina Hitzenberger
9:15		Introduction on the scope of the workshop and outline of what to come! - Thomas Kuhlbusch
9:45		**Topic 1**: **Particle characterisation and characteristics** Chair: Hans Puxbaum (University of Vienna)
	9:50	▪ Chemical characterization of PM from various sources- Hans Puxbaum (University of Vienna)
	10:15	▪ Spatial and temporal variances in particle characteristics in the EU - Jean-Phillipe Putaud (JRC-Ispra)
	10:40	▪ Introduction into the topic question - Harry ten Brink (ECN-Petten)
10:45		*Coffee / tea break*
11:00		Workshop (2 parallel sessions) Group leaders: Harry ten Brink (ECN Petten) Roy Harrison (University Birmingham) Rapporteurs: Jean-Phillipe Putaud (JRC-Ispra) Axel Berner (University of Vienna)
12:00		Plenary: session reports and general discussion
12:30	14:00	*Lunch break*
14:00		**Topic 2: Sources of particulate matter** Chair: Rainer Friedrich (University of Stuttgart)
	14:05	▪ PM Emission inventories – (Rainer Friedrich - University of Stuttgart)
	14:30	▪ Results of source apportionment studies in Spain and comparison with other European regions - Xavier Querol (CSIC Barcelona)
	14:55	▪ Introduction into the topic question - Markus Amann (IIASA Laxenburg)
15:00		*Coffee / tea break*
15:15		Workshop (2 parallel sessions) Group leader: Tuomo Pakkanen (FMI Helsinki) Markus Amann (IIASA Laxenburg) Rapporteurs: Thomas Kuhlbusch (IUTA Duisburg) Maria del Mar Viana (CSIC Barcelona)
16:00		Plenary: session reports and general discussion
16:30	18:00	Poster session (incl. buffet).

Tuesday 4th April:

9:00 **Topic 3: Modelling and (Personal) Exposure**

Chair: Matti Jantunnen (KTL-Kuopio)

9:05
- Determination and modelling of exposure to PM from different sources - Matti Jantunnen (KTL-Kuopio)

9:30
- Modelling of urban population exposure to PM - Carlos Borrego (University of Aveiro)

9:55
- Introduction into the topic question - Matti Jantunnen (KTL-Kuopio)

10:00 *Coffee / tea break*

10:15 Workshop (2 groups in parallel)

Group leader:

Carlos Borrego (University of Aveiro)

Matthias Ketzel (NERI Roskilde)

Rapporteurs:

Wilfried Winniwater, (ARC - Seibersdorf)

Ana Isabel Miranda (University of Aveiro)

11:00 – 11:30 Plenary: session reports and general discussion

11:30 **Topic 4: Health effects: epidemiology**

Chair: Gerard Hoek (IRAS- Utrecht)

11:35
- Acute Health Effects perspective - Gerard Hoek (IRAS- Utrecht)

12:00
- Chronic Health Effects perspective - Nino Kuenzli (IMIM- Barcelona)

12:25
- Introduction into the topic question - Gerard Hoek (IRAS- Utrecht)

12:30 <u>COST 633 MC meeting</u> *(with buffet lunch provided) Everyone else: lunch break*.

14:30 Workshop 4: (2 groups in parallel)

Group leader:

Josyph Cyrys (GSF Munich)

Nino Kunzli (IMIM- Barcelona)

Rapporteurs:

Raimo Salonen (KTL Kuopio)

Michael Riediker (IOHS Lausanne)

15:15 Plenary: session reports and general discussion

15:45 *Coffee / tea break*

16:00 – 16:30 Integrated Assessment Modelling - Markus Amann (IIASA Laxenburg)

19:30 Reception at the city hall

Wednesday 5th April:

9:00		**Topic 5: Heath effects - toxicology** Chair: Ken Donaldson (University of Edinburgh)
	9:05	▪ Which particle characteristics are important in view of health effects? - Ken Donaldson (Univer. of Edinburgh)
	9:30	▪ Are there regional differences in toxicological effects of particulate matter? - Per Schwarze (Folkehelsa Oslo)
	9:55	▪ Introduction into the topic question - Franceline Marano (Université Paris)
10:00		Break (plus press conference and poster viewing)
10:45		Workshop (2 groups in parallel) Group leader: Franceline Marano (Université Paris) Per Schwarze (Folkehelsa Oslo) Rapporteurs: Wolfgang Kreyling (GSF Munich) Flemming Cassee (RIVM Bilthoven)
11:45		Plenary: session reports and general discussion
12:15	13:30	Lunch break + meeting of the 5 topic leaders and 10 break out group leaders) to sum up the reports and prepare the last session
13:30		**Synthesis: Session with stakeholders and policy makers** Presentation of all the topic group discussions and reports, discussion on future work etc. Chair: Thomas Kuhlbusch, IUTA
15:00	15:15	Summary and closing remarks Regina Hitzenberger, COST633 Chair Flemming Cassee, Scientific committee

Workshop lead questions

1. Particle characterisation and characteristics

- How comparable are the measurements of chemical and physical particle characteristics?
- For which particle characteristics are data sets available?
- Are enough data sets available to obtain information on spatial and temporal variances in particle characteristics?
- In how far do local ambient air quality measurements reflect regional air quality?

2. Sources of particulate matter

- What methods for source apportionment are available in Europe?
- Which method is most commonly used?
- What kind of information shall source apportionment deliver?
- What is the current status of basic data sets for source apportionment analysis?

3. Modelling and (Personal) Exposure

- What kind of models are available for the use in air quality assessment and exposure?
- Can/are spatial and temporal variance of elements and source groups be modelled?
- How can (personal) exposure be assessed?
- How do differences in personal activities and habits influence the exposure?
- Does ambient air quality monitoring reflect the exposure of the population?

4. Health effects: epidemiology

- What are the relevant health effect end points to be assessed?
- Which parameter shall be monitored for epidemiological studies?
- What is the current status related to exposure-response functions?
- Do current information allow to assess pan European similarities and differences?

5. Heath effects: toxicology

- Which particle characteristics are important in view of health effects?
- Which parameters shall be monitored?
- Are there regional differences in toxicological effects of particulate matter?
- Is there enough information currently available?

Organizing Committee

Regina Hitzenberger (COST633 Chair), University of Vienna, Austria

Agnes Molnar, Hungarian Academy of Sciences, Hungary

Maria del Mar Viana, CSIC, Spain

Local administrative assistants

Gudrun Breschar, Austrian Academy of the Sciences, Austria

Vera Meyer, University of Vienna, Austria

Scientific committee

Thomas Kuhlbusch (Chair), IUTA e.V., Germany

Flemming Cassee (Co-Chair), RIVM, The Netherlands

Axel Berner, University of Vienna, Austria

Harry ten Brink, ECN, The Netherlands

Carlos Borrego, University of Aveiro, Portugal

Christian Dye, NILU, Norway

Wolfgang Kreyling, GSF, Germany

Franceline Marano, Université Paris 7, France

Michael Riediker, Institute for Occupational Health Sciences, Switzerland

Imre Salma, Eotvos University, Hungary

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Wilfried Winiwarter, ARC systems research GmbH, Austria