NEWSLETTER

WHO COLLABORATING CENTRE FOR AIR QUALITY MANAGEMENT
AND AIR POLLUTION CONTROL at the FEDERAL ENVIRONMENT AGENCY, GERMANY

No. 48 - December 2011

EDITORIAL

New lead for the European Environment and Health Process

The European Environment and Health Task Force (EHTF) has been established at the fifth Ministerial Conference on Environment and Health, held 2010 in Parma/Italy, as the leading international body for implementation and monitoring of the European Environment and Health Process (EEHP) up to the sixth Ministerial Conference on Environment and Health in 2016. EHTF members comprise leading officials from the national implementation mechanisms and structures of all Member States in the WHO European Region, nominated as EEHP focal points for the process, WHO, and intergovernmental and nongovernmental partner organizations.

Fifth Ministerial Conference on Environment and Health

"Protecting children's health in a changing environment"

Meeting for the first time in Slovenia in October 2011, the EHTF discussed proposed areas of joint action to implement the commitments agreed by the Parma Declaration on Environment and Health. Specifically, these areas are for example related to:

- providing evidence to support national policy debates on energy and health,
- adding intersectoral work on environment and health to the agenda for sustainable development, and
- bringing environment and health issues into developments in preventing non-communicable diseases.

This process intends also to discuss the evidence and policy options from different countries on addressing persisting air pollution threats particularly focused on the protection of children's health.

continued on page 2

CONTENTS

In addition to inform our readership on the implementation of this important international European Environment and Health policy process, this Newsletter issue reports on latest air quality and health related activities in the European Region of WHO.

The first article deals with a practical approach to abate the air pollution burden of particulate matter in France (pp 3), followed by a European urban population exposure assessment with regard to EU limit or target values set for the protection of human health (pp 9). The final article about the EU project TRANSPHORM describes the background and aim to develop a tool for policymakers to assess the effectiveness of air pollution reduction strategies in improving public health (pp 12). In addition to that, the section NOTES&NEWS gives few brief insights to selected latest actions.

Hans-Guido Mücke
WHO Collaborating Centre for
Air Quality Management and Air Pollution Control

ABOUT

The NEWSLETTER is published twice a year by the
WHO COLLABORATING CENTRE FOR AIR QUALITY MANAGEMENT AND AIR POLLUTION CONTROL, located at the FEDERAL ENVIRONMENT AGENCY, GERMANY.
It is circulated in 2000 issues and distributed to readers in more than 50 countries.
Additionally, the NEWSLETTER is published on our website (see link below) to be downloaded as pdf. The NEWSLETTER does not constitute formal publications; it should not be reviewed, abstracted or quoted without prior permission. Authors alone are responsible for their articles.

NOTE

We appreciate articles and contributions concerning the subject of
Air Quality Management and Air Pollution Control.
Due to the abuse of e-mail addresses the symbol @ is replaced by [at]!

CONTACT

WHO Collaborating Centre for Air Quality Management and Air Pollution Control
Corrensplatz 1, 14195 Berlin, Germany

phone: + 49-30-8903-1280/81/82, fax: + 49-30-8903-1283
website: www.umweltbundesamt.de/whocc/titel/titel21.htm

THE "PARTICLES PLAN" - AN APPROACH TO REDUCE PARTICULATE MATTER AIR POLLUTION IN FRANCE

Isabelle Derville, Nicolas Michelot, Marie Pouponneau and Marie Fiori

Ambient air pollution by particulate matter is a major challenge for public health. In France, it causes about 42,000 premature deaths each year (CAFE, Clean Air for Europe Programme, http://ec.europa.eu/environment/archives/cafe/general/keydocs.htm). The EU Air Quality Directive 2008/50/EC limit values for particles are currently not performed in several French regions. Faced with these challenges, the French government has adopted the "Particles Plan" in summer 2010 with the objective to reduce fine particles concentrations in the air about 30% by 2015. After a review of the French situation with regard to particulate matter pollution and a short presentation of the "Particles Plan", this article will present two main measures implemented to reduce particulate matter pollution: the setting up of an information as well as an alert thresholds on particulate matter (PM_{10}), and the upcoming implementation of "low emission zones".

Overview of particulate matter pollution in France

In France, four main sectors are responsible for the emission of PM_{10} and $PM_{2.5}$: agricultural activities, industrial processes, residential and tertiary activities, as well as road transport. Altogether these cause up to 80% of local emissions of primary fine particles (Figure 1). The monitoring of particulate matter concentrations is achieved through a large and dense network of air quality monitoring stations: in 2010 a total of 359 stations have measured continuously PM_{10} concentrations in the air (Figure 2).

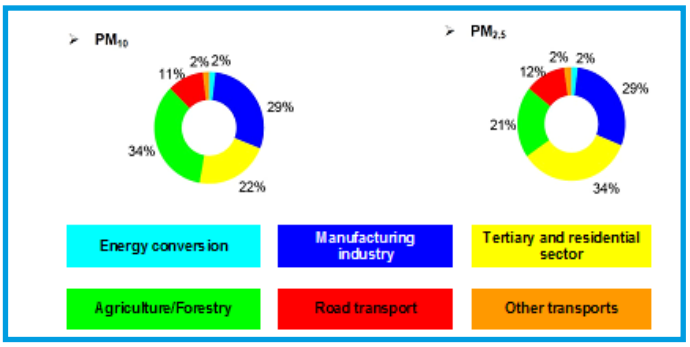


Figure 1: Origins of primary emissions of PM_{10} and $PM_{2.5}$ in France (© CITEPA, http://www.citepa.org/publications/Inventaires.htm#inv1)

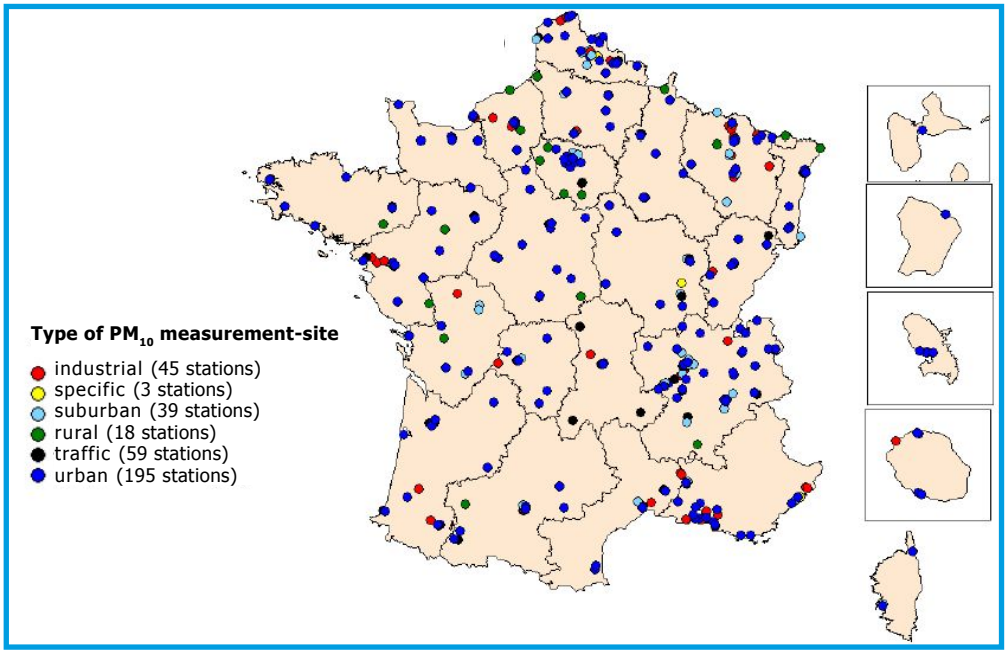


Figure 2: Distribution of sites with PM_{10} measurements; only sites running more than 75% of the time in 2010 are selected (© BDQA, French air quality network, http://www.buldair.org/)

Between 2009 and 2010, a decrease in PM_{10} concentrations was observed for all types of monitoring stations (this decrease was of 9 to 10% for urban background and rural sites, and of around 7% for traffic sites). The annual PM_{10} limit value of 40 µg/m³ was exceeded at seven sites in 2010 (six in 2008 and eight in 2009; Figure 3).

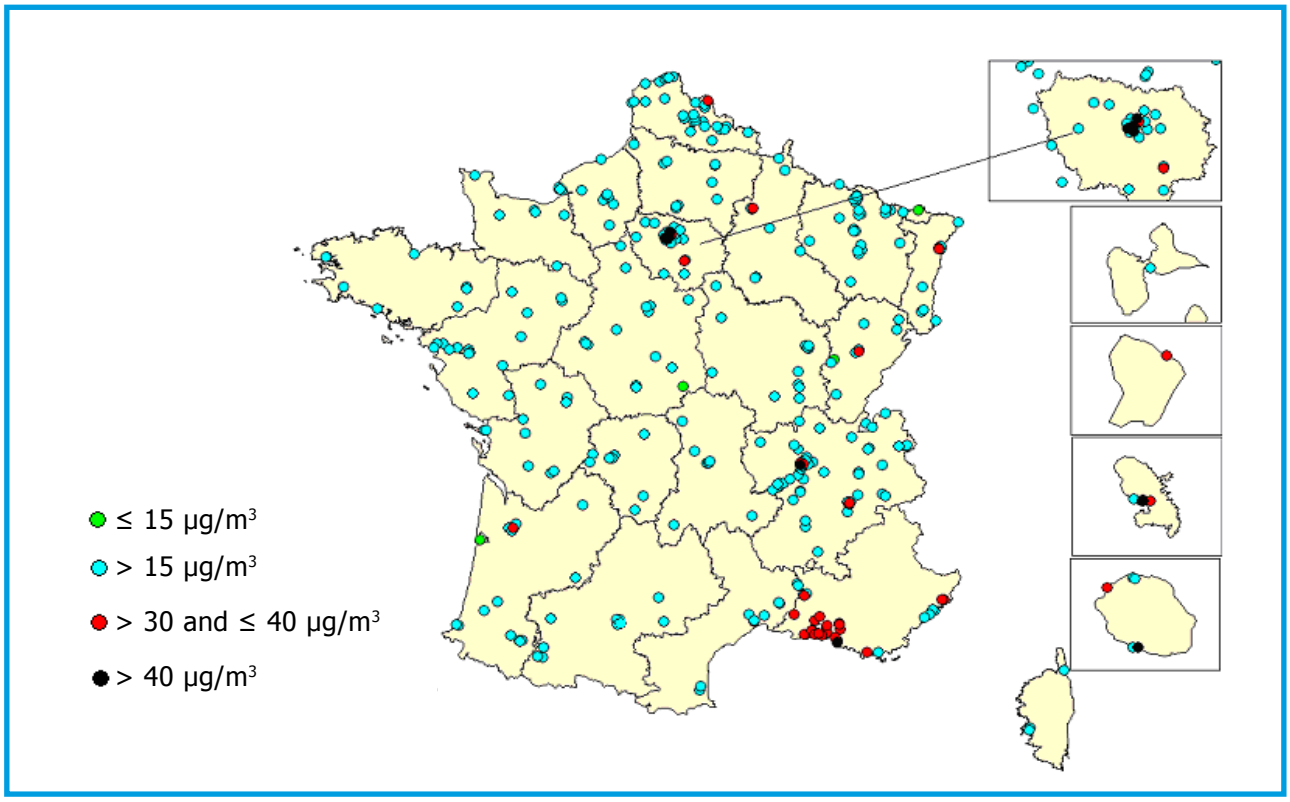


Figure 3: Annual average concentrations of PM_{10} in 2010 (© BDQA)

The daily PM_{10} limit value of 50 µg/m³ should not be exceeded on more than 35 days per year. In 2010 this health-related short-term limit value was exceeded at several monitoring sites (two industrial sites, ten urban and suburban background sites, as well as 17 traffic sites). Figure 4 shows areas in France with exceeded short-term PM_{10} limit values and those in litigation for failure to comply Directive 2008/50/EC (concerning PM_{10}).

Given the challenges to health and environment caused by particulate pollution, France has elaborated the "Particles Plan". The development of this plan was incorporated into the "Grenelle" law which followed the Grenelle Environment Round Table (see box, page 6).

The "Particles Plan" - measures to improve air quality

The main issue of the "Particles Plan" is the reduction of background pollution by particulate matter and not only the prevention of pollution peaks. It is included as part of the second French National Environment and Health Action Plan (NEHAP, http://www.sante.gouv.fr/deuxieme-plan-national-sante-environnement-pnse-2-2009-2013.html) and it is managed by the Ministry of Sustainable Development. The "Particles Plan" sets out actions, at the national and local level, to reduce emissions in the domestic sector, in the service sector, in industries, in transportation and in agriculture. It also has a section on improving knowledge.

Among the measures set out for the domestic sector, it is particularly expected to optimise the wood burning process to minimise their emissions, by giving priority to the development of collective boilers and by providing financial support to the renewal of old home heating appliances.

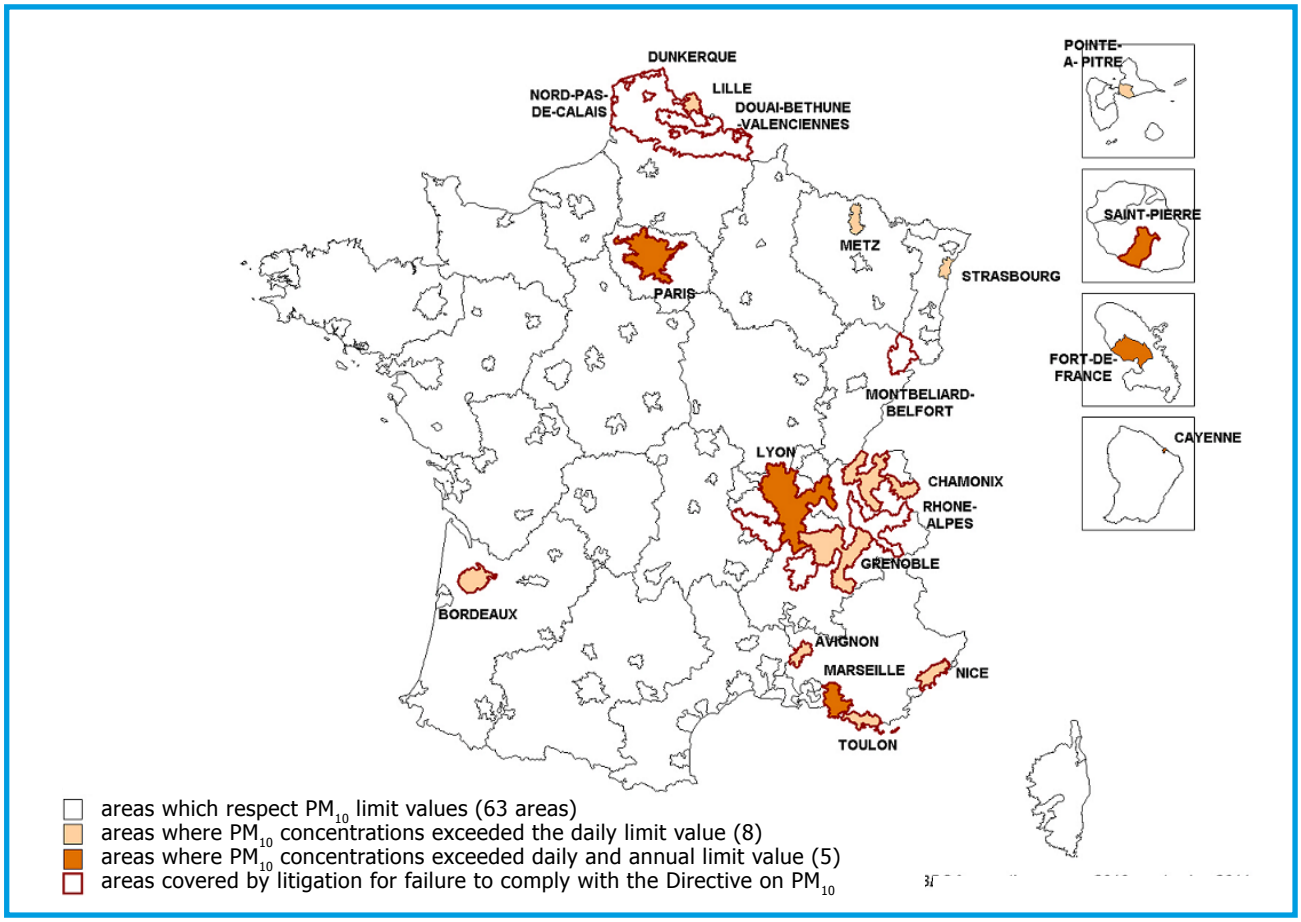


Figure 4: Areas where PM_{10} concentrations exceeded limit values in 2010 and areas covered by litigation for failure to comply with the directive on PM_{10} (© BDQA)

Reducing emissions from the transport sector will include the use of clean transport, and implementation of "low emission zones" (= areas for priority actions for air, ZAPA; see below). A decrease of emission standards for industrial facilities is under preparation in various regulations. Changes in agricultural practices, in managing effluent or spreading, will take a part in this effort (e.g. recommendations to cover on manure storage structures to reduce NH_3 emissions, as NH_3 is a precursor of particulate matter).

The "Particles Plan" section on improving the knowledge is, for example, about a better assessment of emission factors from various polluting activities (e.g. farming), the development of methods to analyse sources of particles and a better understanding of health impacts of particles according to their composition. In addition to its national measures, the "Particles Plan" is implemented locally through the development of regional schemes on climate, air and energy which will be completed in late 2011 - early 2012. These schemes aim to provide guidance to the regional measures for 2020 and 2050 in the fight against air pollution, control of energy demand, development of renewable energy, reducing emissions of greenhouse gases and adaptation to climate change. The principle of these schemes is to ensure the consistency of such policies against each other, in order to avoid actions with antagonistic effects.

Information and alert thresholds to promote less emissive behaviours

Since 2004, two PM_{10} thresholds have been established in France. Since 2010, these thresholds are a daily 24-hour average of 50 µg/m^3 ("information and recommendation threshold") and 80 µg/m^3 ("alert threshold"). The objectives of these thresholds are public information on air quality and dissemination of recommendations to reduce emissions for each major emitting sectors (e.g. recommendations to reduce the use of individual motor vehicle cars and to promote the

The Grenelle Environment Round Table

The "Grenelle de l'Environnement" is a vast consultation process. In a participatory fashion its aim is to prepare long-term decisions regarding the environment and sustainable development in France. Set up in 2007, the Grenelle Environment Round Table comprised six workgroups, including a group for "establishing an environment to protect health" which in particular dealt with questions regarding indoor and ambient air quality.

These groups were made up of representatives from five boards (the State, local government, employers, employees and environmental NGOs) representing the different stakeholders in the field of sustainable development in France. After an intensive public consultation phase (19 regional meetings, 8 online fora with 11,000 contributions, 2 debates at the Parliament, referrals from 31 consultative bodies), the five boards agreed on 268 specific commitments. These commitments were discussed in the French Parliament. Grenelle 1 law defines the main objectives and directions, it turned into force in August 2009. Grenelle 2 law, defines the implementation of more concrete measures, which has been adopted in July 2010.

use of public transport or a safe and physically active mobility, recommendations to reduce dust-generating works, recommendations to reduce the use of generators). Note that for the most polluting industries such recommendations are not binding, but an obligation to reduce emissions in case of exceeding thresholds.

Concerning public information about air quality and health recommendations, the High Council of Public Health was authorised by the Ministries of Health and Sustainable Development to explain the relevance of health-related information and alert thresholds to the public and to develop appropriate health recommendations if necessary, to different target populations, taking into account particularly vulnerable groups, behaviours and types of emission sources.

A gradual and assessed implementation of "Low Emission Zones" in France

1. What is a ZAPA?

In order to rapidly improve air quality in urbanised zones where concentrations of particles and nitrogen dioxide are close to or higher than the limit values, the French government will ratify in summer 2012 the implementation of French Low Emission Zones: priority air action zone (**Z**one d'**a**ctions **p**rioritaires pour l'**a**ir). In cities with poor air quality situation due to particulate matter pollution local municipalities or authorities, responsible for more than 100,000 inhabitants, will be able to establish "experimental zones" (they will only last three or four to five years) where access will be forbidden to vehicles contributing the most to atmospheric pollution.

Local authorities interested in testing a ZAPA and incorporating such into its territory can apply for a file until mid of July 2012 at the Ministry of Ecology, Sustainable Development, Transport and Housing and the Ministry of Interior. Before implementing a ZAPA, the project has to be assessed environmentally and a consultation has to be made (for example with neighbouring cities or transport authorities). Experimentation authorisations will be granted for a period of 3 years (to be prolonged until four to five years if requested by the local authority). ZAPA is an action in the broader sense of Low Emission Zones, because it can integrate other actions besides the restriction of traffic: incentives to optimise the use of vehicles, road flow management, urban planning and to improve the stock of wood heaters in the domestic sector.

2. A national action plan for a local implementation

Regulatory documents are currently under preparation in order to have a national framework for the future ZAPA. In particular, a national framework will set a classification of vehicles according to their pollutant emissions depending on euro standards and the first date of registration. All kinds of vehicles will be included (cars, heavy duty vehicles, buses and coaches, motorcycles). Diesel and petrol vehicles will be distinguished. The cities could choose which vehicle categories will be concerned by their ZAPA. The amount of the financial fine will also be set natinally. A regulatory document will indicate which vehicles will be nationally exempted: police cars, customs car, fire engine, invalid carriages and army vehicles.

3. Feasibility studies upstream the implementation

Considering the innovative character of this concept, feasibility studies for each ZAPA should be done before their implementation. Currently, the French Environment and Energy Management Agency (ADEME) gives its technical and financial support to help eight communities (cities and their suburbs) to study how they can successfully set up and implement a ZAPA (see Figure 5).

In particular, these studies will show different impacts of the ZAPA (on air quality, greenhouse gas emissions, socio-economical impacts) and how the choices made by the community will affect the acceptability. As a supplement of financial support, ADEME leads a national steering committee to ease information exchanges between the eight communities and different organizations liable to make a contribution or to provide knowledge related to ZAPA (e.g. modelling tools to evaluate impacts on air quality).

Figure 5: Eight communities studying the feasibility of implementing a PM_{10}-ZAPA (© ADEME)

4. A scientific assessment of the experimentations

Feedback from experiences of other European countries running Low Emission Zones (LEZ) show that it is necessary to have appropriate tools and specific methods to assess the different impacts of the future ZAPA. Moreover, it is wise to consider assessment in the phase of setting-up and preparation of the ZAPA. An important scientific challenge consists thus in elaborating and in testing new indicators and integrated tools to evaluate the real impacts of the implementation of such air pollution abatement measures.

A call for proposals of research (CPR) on ZAPA was launched in January 2011 by the Ministry of Sustainable Development and ADEME within the framework of the national French programme PRIMEQUAL, an inter-agency research programme to improve local air quality (http://www.primequal.fr). It aims at gathering as many multidisciplinary scientific skills around ZAPAs before implementing them. The main objective of this CPR is to evaluate their future efficiency and to identify key factors that will explain the success from an environmental, health, economical and social point of view. Three project areas were selected. They cover the topics methodologies for the assessment of air quality and traffic-related pollutant emissions, new generation of tools for diagnosis and evaluation of health and economic benefits related to traffic restriction, as well as the acceptance of the ZAPAs.

Conclusion

With the "Particles Plan", the French government has set an ambitious "system" to reduce air emissions, to improve the knowledge on these emissions and their impacts, and to prevent air pollution effects on health and environment. The impact of this plan and the effectiveness of its respective implementation measures at the local and national level will be monitored and evaluated by the National Air Council (CNA) that brings together key players in the field of air quality, such as administrations, public institutions, elected officials, qualified individuals, industrialists, trade unions, associations.

Authors

Isabelle Derville and Nicholas Michelot, Ministry of Sustainable Development
Marie Pouponneau, Environment and Energy Management Agency, ADEME
Marie Fiori, Ministry of Health

Contact

Isabelle Derville
Ministry for Ecology, Sustainable Development, Transport and Housing
Grande Arche, Tour Pascal A et B, 92055 La Défense CEDEX, France

e-mail: isabelle.derville[at]developpement-durable.gouv.fr.

AN ASSESSMENT OF THE AIR QUALITY SITUATION IN EUROPE

Frank de Leeuw

According to the directive 2008/50/EC on ambient air quality and cleaner air for Europe (AQ Directive, EC 2008) the European Commission shall review in 2013 the provisions related to particulate matter and other ambient air pollutants. This article will inform on a base of this review, which is an assessment of limit and target values, information and alert thresholds for selected ambient air pollutants. The complete evaluation was published by de Leeuw and Ruyssenaars as Technical Paper 2011/3 of the European Topic Centre on Air Pollution and Climate Change Mitigation (bibliographics, see 'other publications', page 19).

The following assessment is focused on values for sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter (PM_{10}) and ozone (O_3) set for the protection of human health. With three years of data (2006–2008) and, depending on the pollutant 1,800-2,800 operational monitoring stations (including stations outside the EU), up to 5,000-8,000 data points are incorporated in this assessment.

Sulphur dioxide (SO_2)

The number of exceedances of both SO_2 limit values set for the protection of human health is small. Over the period 2006-2008 in 1.6% of the cases an exceedance of the daily limit value is observed; the hourly limit value is slightly less exceeded: in 1.1% of the cases. In general it is the daily limit value that is the most limiting; only in 13 occasions (0.2%) the hourly limit value is exceeded while no exceedance of the daily limit value is observed. Thus, one may conclude that assessment of exceedances of the SO_2 daily limit value will be sufficient in the future.

The WHO Air Quality Guideline (AQG) level for the daily period is substantially lower than the EU limit value (20 µg/m³ as 24h average). If a similar methodology as in the EEA Core Set Indicator on urban air quality (CSI004) is applied, it is estimated that 70-85% of the urban population within the EU-27 is exposed to levels above the WHO AQG.

Table 1: Reference values for sulphur dioxide as given in the AQ Directive

objective	period	limit or threshold value	number of allowed exceedances
human health	one hour	350 µg/m³	24 hours/year
human health	one day	125 µg/m³	3 days/year
alert (a)	one hour	500 µg/m³	

(a): to be measured over three consecutive hours at locations representative of air quality over at least 100 km² or an entire zone or agglomeration, whichever is the smaller.

Nitrogen Dioxide (NO_2)

For nitrogen dioxide (NO_2) the situation is even clearer. On the one hand the hourly limit value is exceeded in less than 3% of the cases. Furthermore the hourly mean limit value is rarely exceeded, if the annual mean comply with the limit value (during 2006-2008 this is observed for 0.2% of the cases). A general problem all over Europe exists in complying with the annual limit value, because in 19% of the cases the annual limit value is exceeded.

Table 2: Reference values for nitrogen dioxide and oxides of nitrogen as given in the AQ Directive

objective	period	limit or threshold value	number of allowed exceedances
human health	one hour	200 µg/m^3	18 hours/year
human health	calendar year	40 µg/m^3	
alert (a)	one hour	400 µg/m^3	

(a): to be measured over three consecutive hours at locations representative of air quality over at least 100 km^2 or an entire zone or agglomeration, whichever is the smaller.

Particulate Matter (PM_{10} and $PM_{2.5}$)

For particulate matter (PM_{10} and $PM_{2.5}$) various limit and target values for protection of human health are defined (Table 3). A statistical analysis of monitoring data indicates that the daily PM_{10} limit value corresponds to an annual mean concentration of about 28-33 µg/m^3 depending on location. The daily and annual PM_{10} limit value has been exceeded in 34% and 10% of the 803 air quality assessment zones, respectively. Of the EU 27 population 43% (16%) live in zones where the daily (annual) limit value is exceeded in 2009. Note that these population numbers refer to the total population in a zone. The fraction actually exposed will be lower as exceedances may occur only in certain areas within a zone. Applying a similar methodology as used for the EEA CSI004 Urban Air Quality Indicator, 9-14% of the urban population is exposed to an annual mean of 40 µg/m^3 or more; 18-40% are exposed to concentrations above the daily limit value. If the daily PM_{10} limit value is exceeded, there is a probability of 35% to have a concurrent exceedance of the annual limit value.

Table 3: Reference values for PM_{10} and $PM_{2.5}$ as given in the AQ Directive

size fraction	period	value	comments
PM_{10}, limit value	one day	50 µg/m^3	Not to be exceeded on more than 35 days/year
PM_{10}, limit value	calendar year	40 µg/m^3	
$PM_{2.5}$, target value	calendar year	25 µg/m^3	To be met by 1-1-2010
$PM_{2.5}$, limit value	calendar year	25 µg/m^3	To be met by 1-1-2015
$PM_{2.5}$, limit value (a)	calendar year	20 µg/m^3	To be met by 1-1-2020

(a): indicative limit value (Stage 2) to be reviewed by the Commission in 2013

In the AQ Directive a $PM_{2.5}$ reference level of 25 µg/m^3 is set, initially as target value to be met by 2010 and as limit value to be met by 2015. Information from $PM_{2.5}$ monitoring stations is still limited when compared to the available PM_{10} information. In the EU 27 the number of operational stations with a data coverage of 75% or more was 2,400 (PM_{10}) and 570 ($PM_{2.5}$) in 2009. The assessment shows that at 3%, 9% and 7% of the rural, urban background and traffic stations the $PM_{2.5}$ target value is exceeded. Exceedance is also observed at 6% of the industrial sites. The limit value plus Margin of Tolerance (for 2009, 29 µg/m^3) is exceeded at 3% of the stations.

The WHO has recommended guidelines for annual mean levels; the given daily limit values are based on the relation between 24-hour and annual PM levels. The EU limit value for PM_{10} falls between the WHO interim target 2 and 3, the $PM_{2.5}$ target values equals the WHO interim target 2. During the period 2006-2009, 80-90% of the urban population in EU 27 was exposed to annual mean PM_{10} levels above the WHO AQG.

Ozone (O_3)

For ozone (O_3) target values as well as information and alert thresholds for the protection of human health have been defined. Additionally, the AQ Directive defines long-term objectives (LTO). While in the previous ozone directive the LTO should be met by 2020, in the current AQ Directive no date is specified. In 2009, the health related target was exceeded at 36% of the 482 operational rural background stations. In urban areas were the observed concentrations at about 22% of the in total 1,001 stations above the target value. Standards for hourly as well as for 8-hourly concentrations have been set. The AirBase data show a high correlation between the maximum hourly and maximum 8-hourly averaged concentrations with an averaged ratio of the two concentrations of 0.85–0.90. The WHO AQG value is 100 µg/m^3 (8-hourly mean), which is met in a very few cases only. In addition to the AQG, the WHO recommends an interim target (IT-1) of 160 µg/m^3 (8-hour). The EU target value of 120 µg/m^3 which might be exceeded during 25 days per year, corresponds to a maximum 8-hour concentration of about 160 µg/m^3 and corresponds to the WHO interim target value.

Table 4: Reference values for ozone as given in the AQ Directive

objective	period	threshold or target value	number of allowed exceedances
information	one hour	180 µg/m^3	
alert	one hour	240 µg/m^3	
target	max. 8-hour-mean	120 µg/m^3	25 days/year averaged over three years
long-term	max. 8-hour-mean	120 µg/m^3	

Assessment of urban population exposure

Table 5 gives an overview of the most stringent EU limit or target value set for the protection of human health. The EU value is compared with the AQG recommended by the WHO. A rough estimate of the urban population exposed to concentrations above the EU reference value and the AQG is given. This estimate refers to the situation for the period 2006-2008 and it is based on the methodology for the Urban Air Quality Indicator CSI004. Even if the urban population exposure estimates look quite satisfactory for EU reference values, there are still big challenges to meet the WHO AQG.

Table 5: The most stringent EU limit or target levels compared to the WHO Air Quality Guidelines (average period and concentartion, in µg/m^3). Estimate of the fraction of the urban population exposed to level above the reference level. Coulor coding:

<10%	10-50%	50-90%	>90%

Component	EU reference value	Exposure estimate (%)	WHO AQG	Exposure estimate (%)
SO_2	day (125)	0.3-2.3	day (20)	68-85
NO_2	year (40)	7-19	year (40)	7-19
PM_{10}	day (50)	18-40	year (20)	80-90
Ozone	8-hour (120)	16-50	8-hour (100)	>95

Contact

Frank de Leeuw
European Topic Centre for Air Pollution and Climate Change Mitigation (ETC/ACM)
PO Box 1, 3720 BA Bilthoven, The Netherlands
e-mail: etcacm[at]rivm.nl

TRANSPHORM – AN INTEGRATED ASSESSMENT OF THE HEALTH IMPACTS OF TRANSPORT RELATED AIR POLLUTION

Nicholas Good and Ranjeet S. Sokhi

TRANSPHORM is an EU framework 7 funded collaborative project bringing together researchers from 21 institutions with expertise in air quality science and its impact on human health. The ultimate aim of TRANSPHORM is to develop a tool for policymakers to assess the effectiveness of air pollution reduction strategies in improving public health. The main focus of TRANSPHORM is on transport related air pollution, one of the single largest contributors to particulate mass concentrations (PM) in European cities.

The project is currently in its second year and will run until the end of 2014. The focus of the first two years work has been on characterising transport pollution sources, developing transport emission databases, model development and policy analysis. As the project moves past the half way stage the different strands of the project are beginning to be integrated. A major milestone in the project will be the demonstration of a health impact assessment tool at the annual meeting in December 2011. The tool will allow policy makers to assess the effectiveness of strategies for reducing the health impacts of air pollution.

New source characterisation

It is well established that exposure to high concentrations of PM has significant adverse health effects. It is less well understood how the composition, size and number of the particulates is linked to specific health outcomes. One of the first goals of the project has been to provide new physical and chemical characterisation of particulates emitted by different modes of transport in European cities, notably shipping, aviation and road traffic.

Figure 1: European particle number emissions produced by project partner Netherlands Organization for Applied Scientific Research (TNO).

These new measurements as well as existing datasets will be used in TRANSPHORM to help develop new speciated primary particulate number and mass emissions factors for the European transport sector and will ultimately be used to estimate the PM related burden of disease in European cities. Obtaining a more complete and accurate chemical characterisation of transport related emissions is one of the key aims of the TRANSPHORM project. The chemical analysis is targeted at species of specific relevance to human health and those with significant uncertainties in their existing emission quantification, for example heavy metals and poly-aromatic-hydrocarbons.

The main measurement campaigns in TRANSPHORM have taken place in and around airport, motorway and shipping ports. By sampling the air up and down-wind of source areas the enhancement in pollution levels can be calculated. Another focus of the project has been micro-environment measurements. These are measurements of the pollution levels a person experiences whilst in a particular place or performing a specific activity. Micro-environment measurements in TRANSPHORM have, for example, been performed inside cars and on bicycle journeys.

Transport activity

Quantifying traffic levels is necessary not only to assess current emissions but also to project future emissions based on changes in behaviour. A database of transport activity will be developed for EU countries that will include details of the transport types, age and technology. For the test case cities transport activity data will be spatially disaggregated. The transport activity dataset will include past and projected activity for 1990 to 2030. The historical data will be used to develop a dose-response function and the future years will be used as a baseline reference against which mitigation measures will be assessed.

Working with ESCAPE

TRANSPHORM will be collaborating with the ESCAPE study which is investigating the long-term effects on human health of exposure to air pollution. ESCAPE will utilise health data from existing European cohort studies combined with measurement data of PM and NO_X to model the exposure of study participants to pollution at their home addresses.

Data will be available to TRANSPHORM from the ESCAPE project. Specifically, it will provide information on source contributions from different modes of transport. This information will then be used to relate the health outcomes of the cohort participants to their exposure to transport related pollution. This work will ultimately lead to the development of concentration-response functions for transport-related PM metrics. ESCAPE involves sampling campaigns in more than 20 cities in Europe over a one-year period. TRANSPHORM will also analyse additional samples in 10 selected cities for the traffic particulate markers.

The ESCAPE project includes a study involving 33 cohorts, subdivided in four major groups:

1) Birth cohorts where pregnancy outcomes, allergies and asthma will be investigated;
2) Neuro-developmental effects cohorts on adult respiratory disease outcomes;
3) Cohorts on adult cardiovascular disease outcomes;
4) Cohorts on cancer incidence and mortality outcomes.

The evaluation of the cohort data will look at the spatial contrasts in particulate matter and NO_X from road transport experienced by the different cohort members and its impact on outcomes.

Health impact

In order to assess the contrasts in the study areas, measurements of $PM_{2.5}$, PM_{10} and NO_X are being conducted in a number of target areas. PM measurements are being conducted at 20 different sites in each area and NO_X is measured at 40 sites per area. Spatial regression models developed within ESCAPE will be further developed in TRANSPHORM to include detailed geographic data on location of ports, shipping lanes and airports. Analysis will be performed on the PM samples to identify characteristic 'markers' for transport related PM. This information will be used to identify sources and estimate the exposure of the cohorts to PM from different transport sectors, using the exposure models developed from the augmented Land Use Regression (LUR) models, dispersion models and the integrated approach.

The health impacts of airports on the local population have not been studied extensively before. ESCAPE cohorts are located in eight of the busiest airports in Europe. A number of cohorts are also located in residential areas close to smaller airports, thus providing the basis to study the health impacts of airports. Similarly the impact of ports and shipping lanes will be assessed on cohorts in their vicinity.

Modelling pollution

A range of models will be utilised in the project to describe regional through to location specific air pollution concentrations. These will include advanced state of the science models, air quality management models and simplified models. This strategy provides state of the art, advanced models to treat complex situations involving non-linear and multiple scale interactions whilst benefiting from the operational capabilities of air quality management systems. Land use regression models will be used to calculate exposure resulting from different transport source sectors. The simple models will allow scenario analysis to be conducted quickly and for a wide number of cases, which can be computationally expensive with more complex models.

This new information on exposure response functions for long term and short term effects will allow the assessment of impacts of transport related PM pollution on health. TRANSPHORM will develop new functions for acute exposures providing a unique comprehensive treatment of short and long term effects resulting from PM air pollution.

TRANSPHORM will develop methods for estimating the health impacts and associated disease burden of transport-related PM attributable to changes in transport emissions in a year. This will give a methodological basis for assessing the effects of policies and measures that involve sustained pollution changes.

Integrated assessment

The aim is to develop a tool to analyse how changes in emissions of pollutants particularly in cities but also on a wider scale feed through to impact human health. The model will consider the drivers of pollutions and their associated emissions, how the emissions are transported, the human exposure to the pollution and the disease metrics related to the exposure.

The methodology will be implemented in two ways; as a suite of state-of-the-art models and as a suite of simplified models. The assessment tool will be implemented around a central core model. The core model will be used to define a given scenario. Once a scenario is defined the core will call the state-of-the-art atmospheric models, which will model the baseline case. The core will contain all the models needed to assess the health implications for a given scenario.

There will then be the option to run the simplified version which will not call the complex atmospheric models, but use parameterisations of the processes they model in more detail. The fast simplified option will be geared at policy analysis such as assessing the likely effectiveness of different measures. Once a short-list of feasible and potentially effective policies and measures have been identified the state-of-the-art option can be used to thoroughly assess their health impacts. The extent to which the more complex model will need to be run will vary depending upon the changes being implemented, particularly the scale of the changes.

Strategies

Policies are implemented by public authorities with a range of aim, including reducing pollution levels. Policies that impact pollution levels may include toll roads or emissions thresholds for vehicles. A measure is the response to a policy for example; switching to public transport or fitting filters to vehicle exhaust pipes. A pollution reduction strategy may contain a number of policies and measures in order to obtain its aim. Policies can be implemented at different levels (e.g. EU, national and city), it is therefore key to develop a model framework which can account for policies on multiply levels. One of the first tasks performed in TRANSPHORM has been to collate a comprehensive list of strategies that could be employed to tackle air pollution. The list includes not only strategies currently in use but also hypothetical strategies that could be implemented in the future when for example new technologies become viable.

Test cities

To test the health impact assessment tool it will be applied to selected target cities. The cities it will be applied to are Helsinki, Rotterdam and Thessaloniki. In order to ensure the tool and strategies it applies are relevant TRANSPHORM has been working with city authorities.

As well as the three target cities, the London and Oslo city authorities are working in partnership with TRANSPHORM helping to ensure the assessment tool is suitable for their needs.

More information on the TRANSPHORM project can be found at:

www.transphorm.eu.

Information on ESCAPE can be found at:

www.escapeproject.eu.

Figure 2: TRANSPHORM cities

Acknowledgements

- TRANSPHORM is an EC funded FP7 project (ID243406).
- Hugo Denier van Der Gon (TNO) for supplying the particle number emissions figure. NOAA coastline and political borders.
- All TRANSPHORM project partners for their on going work.

Disclaimer

The views expressed in this article are those of the author's only, the EC is not liable for any use that may be made of the information contained within it.

Authors

Nicholas Good and Ranjeet S. Sokhi
University of Hertfordshire, United Kingdom

Contact

Ranjeet S. Sokhi
Centre for Atmospheric and Instrumentation Research (CAIR)
University of Hertfordshire
College Lane, Hatfield, United Kingdom

e-mail: r.s.sokhi[at]herts.ac.uk
website: http://strc.herts.ac.uk/cair/

WHO database shows poor air quality in cities

The World Health Organization/WHO estimates more than 2 million people die every year from breathing in fine particles present in indoor and outdoor air pollution. PM_{10}, which can penetrate into the lungs and may enter the bloodstream, can cause heart disease, lung cancer, asthma, and acute lower respiratory infections. In many cities air pollution is reaching levels that threaten people's health. In September 2011 the WHO headquarters in Geneva, Switzerland, has launched a global compilation of air quality data (http://www.who.int/mediacentre/news/releases/2011/air_pollution_20110926/en/index.html). The database contains results of urban outdoor air pollution monitoring from almost 1,100 cities in 91 countries, including capital cities and cities with more than 100,000 residents. Air quality is represented by annual mean concentration of particulate matter (PM_{10} and $PM_{2.5}$).

The database covers the period from 2003 to 2010, with the majority of values for the years 2008 and 2009 (http://www.who.int/phe/health_topics/outdoorair/databases/en/index.html). The primary sources of data include publicly available national/subnational reports and web sites, regional networks such as the Asian Clean Air Initiative and the European database 'Airbase', and selected publications. The database aims to be representative for human exposure. The main findings contained in the new compilation are:

- Persistently elevated levels of particulate matter pollution are common across many urban areas globally.
- The great majority of urban populations are exposed to an average annual PM_{10} value in excess of the WHO Air Quality Guideline recommended maximum level of 20 $\mu g/m^3$. On average, only a few cities currently meet the WHO guideline values.
- For 2008, the estimated mortality attributable to ambient air pollution in cities amounts to 1.34 million premature deaths. If the WHO guidelines had been universally met, an estimated 1.09 million deaths could have been prevented in 2008. The number of deaths attributable to air pollution in cities has increased from the previous estimation of 1.15 million deaths in 2004. The increase in the mortality estimated to be attributable to urban air pollution is linked to recent increases in air pollution concentrations and in urban population size, as well as improved data availability and methods employed.

Co-benefits to health and greenhouse gas mitigation – Health in the green economy

Many strategies to reduce the amount of greenhouse gas emissions, which slow down the process of and climate change, have large, immediate benefits on human health. Others may pose health risks or tradeoffs. Examined systematically, a powerful new dimension of measures to address climate change emerges. WHO's Health in the Green Economy series, published since spring 2011 (http://www.who.int/hia/green_economy/en/index.html), is reviewing the evidence about expected health impacts of greenhouse gas mitigation strategies in light of mitigation options for key economic sectors considered in the Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007 (IPCC).

The aim is to propose important health co-benefits for sector and health policy-makers, and for consideration in the next round of IPCC mitigation reviews (Working Group III – Fifth Assessment Report). Opportunities for potential health and environment synergies are identified for key economic sectors, including the housing, health, household energy and transport sector.

Following gains refer to the transport sector:

- A shift from private motorized transport to active transport (walking and cycling) and rapid transit/public transport combined with improved land use can yield much greater immediate health "co-benefits" (such as reduced respiratory and cardiovascular disease from air pollution and less exposure to risks of noise stress) compared with improving fuel and vehicle efficiency. In addition, large benefits are expected from increased physical activity leading to the prevention of obesity, diabetes, heart disease and cancer, as well as greater health equity achieved by better access to goods and services among groups without private motor vehicles.
- Transport-related health risks currently affect millions of people. Besides urban air pollution traffic injuries together kill about 2.5 million people every year, mostly in low- and middle-income countries. Active transport can help prevent the 3.2 million deaths annually attributable to physical inactivity.
- Healthy transport mitigation can improve access to jobs, goods and services for disadvantaged economic and social groups. Most of the world's people have limited access to private motorized transport, yet are exposed to transport-related risks such as air pollution and traffic injury. Cities that are accessible by walking, cycling and public transport can particularly improve access to safe mobility and basic services for women, older adults and children, thus improving health equity. The same strategies also generate better health for all socio-economic groups.

How to tackle the Health Problems of Ultrafine Particles in the Air?

Information on health effects of ultrafine particles (UFP, defined as particles with a diameter of 0.1 µm and smaller able to reach the lower airways/alveoli and to pass into the blood) is still limited, especially on the spatial distribution. Recently the new EC INTERREG III project "Ultrafine particle – cooperation with environmental and health policy/UFIREG (from July 2011 to December 2014)" has been established to investigate the short-term health impacts of size-fractioned UFP on mortality and morbidity in Germany, the Czech Republic, Slovenia, and the Ukraine.

Within UFIREG environment and health experts wants to measure UFP and analyze their impact on human health in the cities of Augsburg and Dresden, Prague, Ljubljana, and Chernivsti, derive recommendations to air pollution policies in Europe, and publish the results to health insurances, national and local policy makers, environmental and health authorities and the public. The project UFIREG aims to improve air quality and to save health in Europe.

One of the first tasks is the installation of UFP measuring instruments in the five cities. Measurements have to be prepared, monitoring personnel should be trained. Data availability of air pollution, socio-demographic and epidemiological data will be checked and harmonized in the cities. UFIREG refers to and benefits from the previous EU project UFIPOLNET (Ultrafine particle size Distribution in Air Pollution Monitoring Networks), finished in 2008. Further information can be obtained from www.ufireg-central.eu or from:

Ms Anja Zscheppang
Technical University of Dresden, Medical Faculty
Institute for Clinical Pharmacology, Dresden, Germany
e-mail: anja.zscheppang[at]tu-dresden.de

Human Biomonitoring for Europe – a harmonised Approach

Human biomonitoring (HBM) is an effective tool to assess human exposure to environmental substances, including e.g. ambient and indoor air, and in some cases their potential health risks. It is seen as an essential element in a strategy for environmental health impact assessment.

Supporting the European Environment and Health Action Plan 2004-2010, European scientists and stakeholders from 35 institutions in 27 countries formed a Consortium to perform Human biomonitoring on a European Scale (COPHES 2009-2012), funded within the EC FP7 programme (2007-2013). The project objectives include

- a functional framework allowing the collection of comparable HBM data throughout Europe,
- testing out more harmonized study protocols taking into account similarities and discrepancies in current and planned HBM studies,
- a training and capacity building programme, and
- a communication strategy targeting the scientific community, the individual study participants, policymakers, stakeholders and the population at large.

Testing a coordinated approach in 16 European Member States the EC LIFE+ pilot project DEMOCOPHES will take up a study protocol, functionalities and trainings provided by COPHES, and serve as a central helpdesk.

Within a feasibility study DEMOCOPHES (2010-2012) focus will be given to urinary cadmium, phthalates and cotinine as well as mercury in hair, including 120 mother-child pairs per country. DEMOCOPHES will report back results and lessons learned to enable COPHES to prepare recommendations and conclusions for future EU HBM.

A first joint COPHES-DEMOCOPHES Newsletter was released in summer 2011 (contact: eu-hbm.newsletter[at]hpa.org.uk). Further information can be obtained from www.eu-hbm.info or eu-hbm[at]bipro.de.

JRC Campaign on QA/QC for PM Measurements in Europe

For the purpose of harmonizing PM measurement methods, the European Commission's Joint Research Centre (JRC) and the AQUILA Network of National Air Quality Reference Laboratories have organized a PM quality assurance / quality control programme in Europe.

From 2006 until 2009, 18 measurement campaigns have been organized in European Member States through carrying out parallel measurements with the JRC mobile laboratory next to the Member States National Reference Laboratories and routine monitoring networks. For the campaign's purpose the JRC mobile PM laboratory was equipped with reference samplers for PM_{10}, $PM_{2,5}$, PM_{1}, a continuous PM_{10} instrument and a semi-continuous elemental and organic carbon analyzer.

The campaigns took place during spring and autumn in order to avoid extreme weather situations. Most of the campaigns were set up in urban background locations.

The primary objectives of the programme were

- to provide information on the comparability of PM_{10} measurements as implemented by the national reference laboratories with those of the JRC (ERLAP);
- to investigate the comparability of routine PM_{10} measurements at network monitoring stations with those of the JRC;
- to assess, in the field, the comparability of reference and equivalent methods and the achievements of the data quality objectives (DQO),
- to assess the state of implementation and use of correction factors for automatic monitors in the monitoring networks that are used in reporting under the Directive 20008/50/EC.

In addition, a considerable amount of "secondary" information was aquired throughout the implementation and evaluation of the programme.

For more information, see this issue's publications or contact:

Friedrich Lagler
e-mail: friedrich.lagler[at]jrc.ec.europe.eu

AIR PROTECTION '11 - 7th Croatian scientific and professional Assembly 13-17 September 2011 in Šibenik, Croatia

As a follow up of six successful biannual national conferences (1997-2009) and one international Air Protection conference (2003), the Croatian Air Pollution Prevention Association (CAPPA), together with the Zagreb Institute for Medical Research and Occupational Health (IMROH) and the Zagreb Meteorological and Hydrological Service of Croatia (MHS) organized under the auspices of the Ministry of Science, Education and Sports and the Ministry of Environmental Protection, Physical Planning and Construction of the Republic of Croatia the 7th Croatian scientific and professional Assembly "Air Protection '11", held in Šibenik, 13-17 September 2011.

Out of forty-seven, there were forty oral presentations, while seven investigations were chosen to be presented as posters. Introductory lectures covered the most important aspects of air pollution investigation and abatement:

- WHO activities to abate health impacts of air pollution (H.-G. Mücke, WHO Collaborating Centre, Berlin, Germany);
- Pollutant emission reduction through implementation of international agreements (J. Nećak, Ministry of Environmental Protection);
- Experiences in accreditation of laboratories in the field of air protection in Croatia (Z. Franić, IMROH, Zagreb);
- Modelling of $PM_{2.5}$ particle fraction concentration effects on mortality in Zagreb and Republic of Croatia (K. Šega, IMROH, Zagreb);
- Emission of greenhouse gases from thermal power plants of the Croatian electricity company (D. Lovrić, HEP).

After introductory lectures, the presentations were divided accordingly into the six following topics:

- Air quality management, inspection and control;
- Emissions of air pollutants into the atmosphere;
- Ambient air pollution (immission);
- Development and validation of measurement methods;
- Assessment of exposure and effects to human health and the environment;
- Asbestos in air.

Series of presentations dealt with different fractions of PM pollution (PM_{10}, $PM_{2.5}$ and PM_{1} fractions), their mass concentrations as well as metal, total, organic and elemental carbon, PAH and acid anion content of particles. Among the presentations related to air pollutant emissions, results obtained in the city/region of Zenica (Bosnia and Herzegowina) revealed serious pollution problems due to a number of different industries located in a deep mountain valley with specific meteorological conditions.

The validation of methods was elaborated by: determination of equivalence between different methods to reference ones, comparison of sampler equivalence tests, proficiency testing of air quality laboratories by inter-laboratory comparisons and determination of uncertainties of type approved instruments under field and laboratory conditions. Three of the lectures were dedicated to the investigation of pollen in ambient air, elaborating pollen count, spread, and its historical sequence. The results of metal content in moss as a consequence of air pollution, measured in samples covering equally the state territory were presented, showing an alternative biomonitoring approach to investigate air pollution.

During the course of the meeting, three short movies were shown to the participants, two of them related to the asbestos problem. The third, an animated film, told the story about the predicted influence of global warming to the life of future generations in an artistic view.

A round table discussion at the last day of the meeting dealt with the proposal of the new Air Protection Law which is in the process of adoption by the Croatian Parliament. The role of national reference laboratories and their participation in Croatian air pollution monitoring and conducting monitoring within the State air pollution monitoring network were the main issues. Discussing and elaborating complaints and proposals, the participants concluded in the name of CAPPA to prepare a brief with conclusions and recommendations for the Ministry of environment as the proponent of the law.

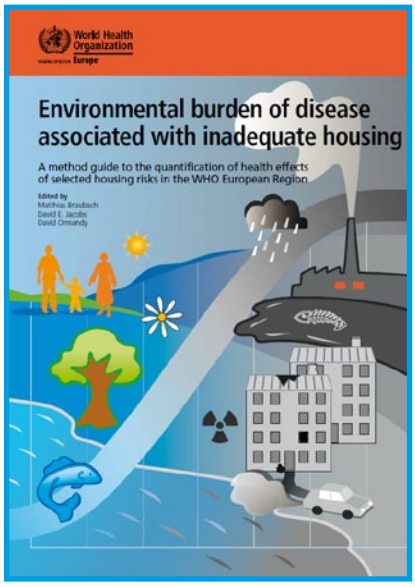
An abstract book (ed. K. Šega) containing presentation abstracts, both in Croatian and English language, was distributed to the participants along with other materials and can, as well as presentations, photographs and three short films shown during the conference, be found at the CAPPA web-page: http://www.huzz.hr/index.html.

Krešimir Šega
Environmental Hygiene Unit
Institute for Medical Research and Occupational Health
Zagreb, Croatia

e-mail: ksega[at]imi.hr

Environmental Burden of Disease associated with inadequate Housing – A Method Guide to the Quantification of Health Effects of selected Housing Risks in the WHO Euro Region

Edited by M. Braubach et al., WHO European Centre for Environment and Health, Bonn Office, published by WHO Regional Office for Europe, Copenhagen, Denmark 2011, 238 pages, available online only: http://www.euro.who.int/__data/assets/pdf_file/0003/142077/e95004.pdf.



This guide describes how to estimate the disease burden caused by inadequate housing conditions for the WHO European Region as well as for subregional and national levels. It contributes to the WHO series of guides that describe how to estimate the burden of disease caused by environmental and occupational risk factors. An introductory volume to the series outlines the general methodology.

In this context, the WHO Regional Office for Europe took up the challenge to quantify the health effects of inadequate housing and convened an international working group to quantify the health impacts of selected housing risk factors, applying the environmental burden of disease (EBD) approach.

The guide outlines, using European data, the evidence linking housing conditions to health, and the methods for assessing housing impacts on population health.

This is done for twelve housing risk factors in a practical step-by-step approach that can be adapted to local circumstances and knowledge. This guide also summarizes the recent evidence on the health implications of housing renewal, and provides a national example on assessing the economic implications of inadequate housing. The findings confirm that housing is a significant public health issue. However, to realize the large health potential associated with adequate, safe and healthy homes, joint action of health and nonhealth sectors is required.

World Health Statistics 2011

WHO Publications, Geneva, Switzerland 2011, 170 pages, ISBN 978 92 4 156419 9, available online in English, French and Spanish language: http://www.who.int/whosis/whostat/2011/en/index.html.

"World Health Statistics 2011" contains WHO's annual compilation of health-related data for its 193 Member States. The Report includes a summary of the progress made towards achieving the health-related Millennium Development Goals (MDGs) and associated targets. Infant and child mortality estimates are computed by the WHO in collaboration with other international agencies using standard categories and criteria for data and standard methods to ensure cross-national comparebility.

PUBLICATIONS — PUBLICATIONS — PUBLICATIONS — PUBLICATIONS — PUBLICATIONS — PUBLICATIOPNS — PUBLICATIONS — PUBLICATIONS

A Quality Assurance and Control Program for $PM_{2.5}$ and PM_{10} Measurements in European Air Quality Monitoring Networks

F. Lagler, C. Belis and A. Borowiak, European Commission, Joint Research Centre, Institute for Environment and Sustainability, Ispra, Italy 2011, 118 pages, EUR 24851 EN - 2011, also available online: http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/22257/2/lbna24851enn.pdf.

To harmonize PM measurements in the European Union, the JRC together with the AQUILA Network of National Air Quality Reference Laboratories organized a PM QA/QC programme. From 2006 – 2009, the JRC, equipped with a mobile laboratory, measured in 18 Member States, for a duration of two weeks each, PM_{10} and $PM_{2.5}$ in parallel to measurement sites of local networks and to the National Reference Laboratories. The main goals of the project were to find out to which degree PM measurements performed in the Member States agree with the requirements of the relevant EU directive and how correction factors for automatic analyzers were applied. For additional information, please see Notes & News, page 14.

European Air Quality Maps of Ozone and PM_{10} for 2008 and their uncertainty Analysis - ETC/ACC Technical Paper 2010/10

European Topic Centre on Air and Climate Change, Bilthoven, The Netherlands 2011, 55 pages, available online: http://acm.eionet.europa.eu/reports/docs/ETCACC_TP_2010_10_AQMaps2008.pdf.

This paper provides an update of the European air quality concentrations of selected pollutants, their exceedance probability and population exposure estimates for another consecutive year, 2008. The analysis is based on interpolation of annual statistics of the 2008 observational data reported by EEA Member countries in 2009 and stored in AirBase. The paper presents the mapping results and includes an uncertainty analysis of the interpolated maps, building upon the latest methodological developments. These maps, with their spatial exceedance and exposure estimates are intended to be used for the assessment of European air quality by the EEA and its ETC/ACC, and for (interactive visual) public information purposes through the EEA website.

Air Pollution by Ozone across Europe during Summer 2010 - EEA Technical Report 6/2011

European Environment Agency, Copenhagen, Denmark 2011, 38 pages, ISBN 978 92 9213 210 1, available online: http://www.eea.europa.eu/publications/air-pollution-by-ozone-across.

This report gives an overview of exceedances of EU ozone threshold values for April to Seprtember 2010. It shows that the long-term objective to protect human health (maximum daily eight-hour mean concentration of 120 µg/m^3) was exceeded in all EU Member States and in most of the other reporting European countries at least once during summer 2010. As in previous years, the most widespread concentrations occurred in the Mediterranean area. However, areas of western and central Europe experienced higher ozone concentrations than in 2009.

Preliminary results show that 17 EU Member States (Austria, Bulgaria, Cyprus, the Czech Republic, France, Germany, Greece, Hungary, Italy, Luxembourg, Malta, Poland, Portugal, Romania, the Slovak Republic, Slovenia and Spain) are facing difficulties in meeting the target value for protecting human health, applicable as of 2010. In all these countries, the maximum daily eight-hour mean ozone concentration of 120 µg/m^3 was exceeded on more than 25 days during summer 2010.

European Exchange of Monitoring Information and State of the Air Quality in 2009 - ETC/ACC Technical Paper 2011/1

European Topic Centre on Air and Climate Change, Bilthoven, The Netherlands 2011, 77 pages, available online: http://acm.eionet.europa.eu/docs/ETCACM_TP_2011_1_eoi2010_2009aqdata.pdf.

Current EU air quality legislation, Council Decision (97/101/EC), requires the European Commission to prepare yearly a technical report on the meta information and air quality data that have been exchanged among the EU Member States and the Commission. Besides, the member and collaborating countries of the European Environment Agency, which include EU (potential) candidate countries and EFTA states, have agreed to follow this reporting procedure as well. All this information is made available in the AirBase database. This technical report provides an overview of the reporting cycle on the data for 2009.

Evaluation of current limit and target Values as set in the EU Air Quality Directive - ETC/ACC Technical Paper 2011/3

European Topic Centre on Air and Climate Change, Bilthoven, The Netherlands 2011, 38 pages, available online: http://acm.eionet.europa.eu/docs/ETCACM_TP_2011_3_evaluation_AQ_LT_TV.pdf.

According to directive 2008/50/EC on ambient air quality and cleaner air for Europe the Commission shall review in 2013 the provisions related to $PM_{2.5}$ and, as appropriate, other pollutants. This report aims to inform this review by assessing current information on limit values, target values, information and alert thresholds. It discusses briefly the application area of the AQ Directive and for each of the components an assessment of the air quality in the European Union is presented. It highlights for each pollutant (i) the current situation of air quality in Europe and, if more than one standard is defined, which is the more stringent one; (ii) a short comparison of EU values with other international air quality standards. The results are discussed and a number of points which could be considered in the review of the Air Quality Directive are presented. You will find more detailed information on this issue's page 8.

Institute for Medical Research and Occupational Health - Annual Report 2010

Institute for Medical Research and Occupational Health, Zagreb, Croatia 2011, 88 pages, ISSN 1847 294X, available online: http://www.imi.hr/file_download.php?fileID=194.

In its research section, this bilingual (Croatian and English) report gives a short review of projects financed by the Ministry of Science, Education and Sports. The second section includes Institute's professional, teaching, and publishing activities, a list of meetings and colloquia organised at the Institute, and the Institute's structure with a list of employees and their position. It concludes with a list of publications released in 2010.

COMING EVENTS — COMING EVENTS — COMING EVENTS — COMING EVENTS — COMING EVENTS

2012

Eighth International Conference on Air Quality – Science and Application (formerly Urban Air Quality Conference)
19-23 March, Athens, Greece, http://www.airqualityconference.org/.

Urban Transport 2012 – 18th International Conference on Urban Transport and the Environment
15-17 May, La Coruña, Spain, http://www.wessex.ac.uk/12-conferences/urban-transport-2012.html.

Air Pollution 2012 – 20th International Conference on Modelling, Monitoring and Management of Air Pollution
16-18 May, La Coruña, Spain, http://www.wessex.ac.uk/12-conferences/airpollution-2012.html.

44th Annual Air Pollution Workshop and Joint Meeting
18-27 May, Kaunas, Lithuania, http://www.apworkshop.org.

Forest Fires 2012 – Third International Conference on Modelling, Monitoring and Management of Forest Fires
22-24 May, New Forest, United Kingdom, http://www.wessex.ac.uk/fires2012rem1.html.

Urban Environmental Pollution – Creating Healthy, Liveable Cities
17-20 June, Amsterdam, The Netherlands, http://www.uepconference.com.

Environmental Impact 2012 – First International Conference on Environmental and Economic Impact on Sustainable Development
2-4 July, New Forest, United Kingdom, http://www.wessex.ac.uk/impact2012cfp.html.

Healthy Buildings 2012 – 10th International Conference on Indoor Air Quality and Climate
8-12 July, Brisbane, Queensland, Australia, http://www.hb2012.org.

Fourth Air Quality Management and IUAPPA Conference
4-7 September, Istanbul, Turkey, http://www.iuappa.org/index.html.

2013

AQE 2013 – The Air Quality Show; Conference, Exhibition and Workshops
13-14 March, Telford, United Kingdom, http://www.aqeshow.com/index/.

16th IUAPPA World Clean Air Congress
September 2013, Cape Town, South Africa, more information coming soon: http://www.iuappa.org.