

International Union of  
Air Pollution Prevention  
and Environmental  
Protection Associations



**Three Year Review  
2007-2010**

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### What We Do, and Why

*Air pollution causes over 800,000 advanced deaths and tens of millions of respiratory and other illnesses each year. It damages ecosystems and affects quality of life, reduces economic activity and reinforces the cycle of poverty in many areas of the world.*

*It does not respect national boundaries, and can be transported regionally, hemispherically and even globally.*

*Solutions require co-operation at all scales, from the local to the global, and these solutions must take account of other environmental, social and economic considerations.*

*IUAPPA helps to develop and promote such solutions. It brings together governmental and non-governmental organisations across the world, to share scientific and technical information in pursuit of more effective policies for pollution control and sustainable development.*

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## From the President

This report outlines the activities of the Union for the years 2007 - 2010. It records the main outcomes of our recent work, and discusses some of the issues likely to demand our attention in the next few years.

Three years is not long. Yet much has changed since our XIVth World Congress in Brisbane. In some areas progress in air and environmental quality has continued, but in others it has ground to a halt or gone into reverse. And in many of the areas of global policy linked to air pollution - climate change, crop damage, desertification and declining biodiversity - much of the optimism of a decade ago has receded. So the challenge of protecting and improving atmospheric quality remains as relevant and demanding as it has ever been.

Our values and goals must therefore remain unchanging. However, as I reflect back on the past few years I believe it should be clear to all of us that in order for IUAPPA to remain viable, our structure and ways of working must evolve - continuously and rapidly - to reflect radical changes in the environment in which we operate: in the science under-pinning our work; in our increasingly important links to changing environmental, social and economic policies; and in the shifting policy context within which a non-political and non-sectarian organisation must operate.

As this review shows there is much in IUAPPA's work over the past few years from which we can draw encouragement, such as the regional conferences in South Africa and Tunisia and our involvement with important and timely programmes related to transportation issues, pollutant co-benefits, and the global transport of air pollutants. Since Brisbane we have also had lively debates on how to widen our membership structure to ensure it is relevant and welcoming to the great diversity of organisations, institutions and individuals who share our aims: how to make our Congresses not just IUAPPA meetings but, as they should be, a central focus of the global atmospheric policy calendar; and how to promote broader and more direct communication and co-operation among all our member organisations.

I believe that a large measure of consensus has now emerged on these issues. Now is the time to build on that and resolve outstanding issues so that the Union can grow and move forward confidently with its work.

*Alan Gertler*



## Conferences and Meetings

*This triennium began in Australia, and ends in North America. Several meetings were held jointly with EFCA in Europe, and representatives of the Union addressed meetings in Asia and Latin America. But, for the first time, it was Africa - both North and South - that was host to the Union's main meetings and the focus of much of its activity.*

### South and Southern Africa

Over 270 participants attended our highly successful 2008 regional conference in South Africa's Mpumalanga Province - 'the place of the rising sun.' With the theme "Where did all the clean air go?" It highlighted air quality issues in Southern Africa, and included sessions on regional air quality, urban air quality, air quality management, modeling, monitoring methods, industrial air pollution and climate change.

The conference was opened by the Deputy Minister for Environment and Tourism, and the Director-General for Air Quality Management and Climate Change and his staff were engaged throughout. Overall, the conclusion was that, while Southern Africa faced challenging air quality problems, distinctive African solutions were emerging to local problems.

The conference included special sessions on two priority IUAPPA issues - transport in mega-cities and air pollution/climate co-benefits. Each session brought international and African regional perspectives to bear.

In the transport in mega-cities session, the current situation of urban air pollution in Africa and its impacts were reviewed and emerging solutions to the problems of air pollution in Africa's rapidly growing cities considered. In Africa, as in other world regions, rapid growth and development of urban centres remains a serious challenge to existing transport infrastructure. Public transport fleets have struggled to keep up with demand and private car fleets are expanding rapidly. The conference presented a timely opportunity to take stock.

Dr Alan Gertler introduced the session and spoke of his experiences in Cairo and Hyderabad where the monitoring networks

were revealing high levels of air pollution, with serious health impacts. The Southern African context was described by Dr J J Cumbane of the Eduaodo Modlane University in Mozambique. He stressed the urgent need to address the high pollution levels (notably fine particulate) in major Southern African cities which are the result of a combination of traffic and burning wood or coal for cooking and heating. He also emphasised the need for African solutions, and urged that imports of outdated vehicle technology from outside Africa should be resisted. Echoing the need for local solutions, Cornie Huizenga, of the Clean Air Initiative - Asia, described the expanding sales of electrically-powered scooters in China as an example of a locally developed solution to the problem of rapidly growing fleets of motor cycles and scooters in Asian cities.



*Sara Feresu on Co-Benefits in Southern Africa*

The importance of maintaining emission performance was emphasised by David Oliver of Cape Town Transport Department. Cape Town's roadside testing programme subjects non-compliant vehicles to heavy penalties and the numbers of failing vehicles have declined noticeably over five years of testing.





*IUAPPA Board meeting, Nelspruit, South Africa 2008*

Fuels also play an important role in managing vehicle pollution, and Anton Moldan of the South Africa Petroleum Industry Association described plans for improvement in fuel quality. There had been good progress in introducing unleaded petrol in South Africa, anticipating the introduction of cars with three-way catalysts. Regulatory certainty was a necessary condition for progress, backed by incentives for early implementation of new fuel standards.

Measures on vehicles are only part of the solution, and innovative solutions for overall transport systems were illustrated by Mrs Asteria Mlambo, Director of Transportation and Business Development at the Dar Rapid Transit (DART) Agency. The project provides a guided bus service, replacing thousands of mini buses and ensuring that the roadway is shared by all users. The initial 29-kilometre line is already enjoying high levels of ridership and there are ambitious plans for a further four lines over the next ten years. Emphasising the need for a range of solutions, Mrs Mlambo also spoke of her role in the Association for Advancing Low Cost Mobility, an NGO spearheading the development of non-motorised transport (in particular cycling).

In the concluding discussion the focus was on the need for integrated solutions, combining affordable mobility with low emissions transport.

Strict controls on imports of second-hand vehicles, together with progress on fuel quality, were highlighted as urgent priorities.

Opening the special plenary session on climate change/air pollution co-benefits in southern Africa, Jeff Clark of the IUAPPA Secretariat described the outcomes of the Global Atmospheric Pollution Forum's recent conference on the issue in Stockholm. Cornie Huizenga then provided an Asian perspective on co-benefits in the developing world, noting how approaches that work in Europe or North America are not necessarily applicable in Asia; for example, Asia has limited experience with cap and trade programmes and will need to pursue co-benefits using other means.

Dr Stuart Piketh from the University of the Witwatersrand, Johannesburg, gave a scientific overview of co-benefits and then identified several opportunities for pursuing co-benefits in southern Africa, including the reduction of emissions from wood burning for domestic heating and cooking which would have climate and health benefits. He also noted that controlling methane from landfill sites holds promise for climate/air pollution benefits.

He emphasised however that not all measures can produce 'win-win' scenarios. For example, implementing a policy to increase diesel vehicles

to reduce CO<sub>2</sub> would have a serious adverse effect on PM levels in the urban environment. He noted that in the South African context this could not only be a concern but could provoke a crisis. He also described how integrated GHG and air pollution emission management can significantly reduce the duplication of administrative load on both authorities and industries.

The concluding panel session agreed that it would be useful for many developing countries to build in climate change from the ground up as they develop their air pollution programmes, as was already happening in South Africa. However southern Africa contributes only a tiny fraction of global greenhouse gases, and air pollution is therefore the likely entry point to develop co-benefits approaches in the region. Overall, the session succeeded in driving home the importance of integrating climate change and air pollution policies, and highlighting some of the special circumstances facing Southern Africa.

## Better Air Quality for North Africa

The 2009 IUAPPA Regional Conference was a 'first' in two important respects. It was the first time that IUAPPA met in the North African region and it proved an opportunity to meet colleagues involved in environmental issues in the region and to find out more about their concerns. It was also the first time that IUAPPA had linked up with other international organisations for its



*Informal discussions after a long day*



*"Let's put our heads together to create clean air for Africa", IUAPPA Regional Conference, Tunis 2009*

regional meeting, co-operating in this case with UNEP and the Sahara-Sahel Observatory, two of its partners in the Global Forum. This partnership both strengthened the meeting and gave added weight to its conclusions.

The meeting was opened by H E Nadhir Hamada the Minister of Environment and Sustainable Development of Tunisia who underlined how important it would be to address sources of air pollution in North Africa and the benefits to health that would follow. Following this, there were four main sessions:

*1. Air pollution and the Urban Environment, an update on problems worldwide and progress in addressing them. This session focused in particular on the problems associated with managing the impacts of transport growth in mega cities, in particular in managing air quality. There were special contributions on the air quality situation in each of the North African countries.*

*2. Health Impacts of Air Pollution, with an assessment of impacts in North Africa and an analysis of international trends.*

*3. Reducing the Impact of Transport and Industrial Emissions, with an analysis of the international context and a particular emphasis on strategies that might best reduce pollution burdens in North Africa Increasing Public Awareness, with contributions from Government and NGOs.*





*Serious discussions on creating clean air for Africa*

*4. Opportunities for Regional Action, a session in which the wider issues of air management at a regional and global scale were considered.*

In all, participants included delegations from all six North African Countries, many other parts of Africa and representatives from some eight international bodies. They heard over 40 presentations during the three days of the Workshop. There were many common threads in the issues raised: rapid urban growth driving demand for transport and with it high levels of urban air pollution; high natural background levels of suspended particulate from arid areas and the intense sun light driving photochemical pollution. Clearly, given this, there is high regional concern about the health impacts of air pollution but for some countries, notably Mauritania, there are also concerns about the impacts of air pollution on food security. Photochemical pollution in these very arid parts of the world, exacerbated by intense heat, puts current, barely adequate, levels of production at risk.

There is, however, much activity in the search for regional solutions and it was pleasing to see so many civil societies at the meeting, including the IUAPPA Member organisation, Women

for Sustainable Development. There is clearly a strong interest in working together, growing both from commercial interests, in cleaner fuels for example, and from the recognition that air pollution issues have a transboundary component. The development of regional air monitoring systems with cooperation in sharing information is likely to be an initial outcome of the Workshop, following a contribution from a representative invited from the European Monitoring and Evaluation Programme. There is also the prospect of movement towards a regional agreement on air quality management. IUAPPA and the Global Forum will be there to support these initiatives and will no doubt wish to draw on the experience and expertise in member organisations.

The meeting ended with the preparation of conclusions on the frameworks and options for improving air quality in North Africa. These conclusions are being assembled into a paper for submission to the Arab Maghreb Union, arguing for the establishment of an Inter-Governmental Network on Air Pollution in North Africa, to spearhead regional initiatives for the improvement of air quality in the region.

# Promoting Science, Developing Policy

## Transport and Air Quality Seminar Programme; Drawing Conclusions

This year's Seminar in Vancouver marks a further stage in a journey, begun in Sao Paulo, which has taken in venues as diverse as Mexico City, Tokyo, Istanbul, Brisbane, London and South Africa. But the aims have always been the same: to bring together transport and air quality practitioners from different regions; to cast helpful light on the challenges facing the host city; and to provide an update on new developments in a field critical to air quality.

In spite of the diversity of the host cities and the wide range of conclusions the underlying message of the seminars has been the same. Improvements in emissions performance of individual vehicles are essential to deliver cleaner air in cities, but they are not alone enough. They have to be complemented by demand management measures, which could include incentives to early adoption of new technology, and the use of pricing mechanisms, parking controls or planning in ways which reduce the volume and impact of vehicles while maintaining or increasing mobility and access.

### From Latin America to Asia and Africa

For cities in Latin America, where the programme started, the characteristic strategy has included a major investment in Bus Rapid Transit systems, combined with fuel changes and retrofitting for public vehicles and freight transport, and new policies to improve public spaces, ease walking and cycling and provide other alternatives to car use. Such strategies, essential to maintain the liveability of cities, were often initially not popular nor easy to implement, and Latin American experience suggested that they required both exceptional political leadership and an effective - and probably unitary - structure of local government for the area subject to the strategy.

When we shifted the focus to Asian cities we expected that both the issues and the appropriate responses would differ. Certainly, Asian cities are, in general, more densely populated and often at a more advanced stage in motorisation, and with a different vehicle stock, including in particular very high volumes of motorcycles and similar vehicles. What the Tokyo seminar revealed, however, was that, in many respects, the conclusions for Latin America held good for Asia, although the presentations showed diversity in detail.

Asian presentations were marked by some notable examples where effective adoption of new fuels and technologies combined with strong measures to manage demand had yielded striking success, such as Singapore, Hong Kong and Tokyo. However, particulate pollution, particularly from rising numbers of diesel vehicles, was usually a challenging problem. Seoul, Tokyo and Beijing were implementing impressive retrofit programmes, but there remained cities where policies had been less successful, notably Bangkok, Jakarta and Manila. Jakarta and Manila also made clear the difficulty of introducing demand management measures against a background of earlier transport fuel subsidies.

When the focus moved to Africa, with presentations of experience in Mozambique, Tanzania and South Africa, many of the same themes emerged. However, what they contributed was a new sense of urgency in learning international lessons, as the continent faces an explosion of rapidly-emerging mega-cities.

### Highlights

What, at a more detailed level, have been the most important lessons? One has to be the presentation in Brisbane of a coherent and authoritative long-term road map on the likely availability of future fuels and technologies, potentially an invaluable tool for transport and air quality planners. Another was the opportunity at the Mexico



meeting to draw on the insights and experience of Sir Christopher Foster, the original proponent of Congestion Charging in London.

## Planning

But two others also stand out. The contribution of planning policy is normally long-term, so there has been great interest in presentations on how municipal authorities could use 'planning agreements' to require developers as a condition of planning consent to deliver a variety of air quality benefits, for instance improvements to their fleets, a low emission zone, or construction practices that minimised emissions and dust. Clearly these measures will work best where there is a strong planning system, and in a period of economic growth when development pressures are strong, but it was clear that the approach is of general significance.



*South bound congestion on the M25, London*

## Demand Management

Perhaps even more important was a presentation from Singapore on the role of demand management and the circumstances in which it can operate effectively. This set demand management in a broad economic framework, recognising that the need for it arose where consumers were not paying the full cost of road transport and therefore used vehicles more than was optimal for society. If the system was to operate within the available infrastructure it was essential that user costs were increased or that the costs of alternatives were reduced. In essence therefore that meant that governments had to explore the alternatives of pricing - taxation or user charges - or parking controls or other physical or planning measures to restrain actual use, such as low emission zones.

What emerged was that demand management measures were most likely to be effective if first introduced before motorisation has taken off; if presented not in terms of negative constraints but in a positive and visionary way which highlights beneficial outcomes (such as greener cities, more 'democratic' public space etc); and if the focus of policy is on mobility of goods and services rather than on traffic outcomes (vehicle movement, speed, congestion etc). The issue of how revenue obtained from motoring taxes and charges was subsequently used was also critical to public acceptability. Finally, it was no good waiting to introduce demand management measures until good public transport was in place: those cities that followed this line were still waiting.

A good many such lessons have emerged from the programme so far, and for that the Union owes a debt not only to our guest presenters but also to our partners, in particular the Molina Initiative in Mexico City and the EMBARQ programme in Istanbul, and - for invaluable financial assistance - to Johnson Matthey plc, The British Council and BP plc.

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## Air Pollution and Climate Change - Towards Integrated Strategies and Co-Benefits

### IUAPPA's Contribution

The relationship between air pollution and climate change - and the financial savings that integrated strategies could deliver - has become one of the central issues of air quality. IUAPPA has been closely involved in developing the issue at every stage.

The Union's World Congress in London in 2004, which took as its theme the interaction of climate and pollution, was among the first major international meetings to highlight the issue. In 2008, the Global Forum's Stockholm International Conference on Co-benefits - organised by IUAPPA and the Stockholm Environment Institute - brought the issue of co-benefits to prominence and resulted in a coherent policy framework focused on the critical role of the 'short-term climate forcers' - ozone, aerosols and methane - which are both major pollutants and important climate change agents.

Between these two landmarks a decisive step was the development of the GAINS model by IIASSA - an integrated assessment process for optimised strategies for air pollution and climate. This clearly indicated that integrated strategies could reduce the overall cost of delivering long-term climate and air pollution goals by as much as 20%. The inescapable conclusion for IUAPPA and its partners was that co-benefits should be a primary concern, and this has been increasingly reflected in our programmes.

### The Current Position

The conclusions of the Stockholm International Conference (see page 11) stand as the fullest and most coherent statement of the issues and opportunities, but in the last two years

there have been other important initiatives by members of the Union and organisations with which we co-operate:

- The European Federation for Clean Air has produced important recommendations on how the European Union could integrate its policy-making processes for air quality and climate. A key proposal is that whenever EU Air Quality Directives come up for review there should be an obligation to take account of implications for climate change.
- APPA, IUAPPA's French member organisation, is playing a significant role in promoting the French Government's strategy to integrate air pollution and climate policies at the regional and local scales.
- An 'Asian Co-Benefits Partnership' has been established by the Institute for Global Environmental Strategies in Japan, which works closely with the Global Forum.
- The Stockholm Conference concluded that countries newly introducing Air Quality Management Systems had an opportunity denied those with established systems to move directly and simply to integrated air quality-climate systems. The Union's regional conference in South Africa highlighted how this had been achieved in South Africa.
- The GAP Forum is promoting the potential value of the regional inter-governmental air pollution networks as vehicles for integrated co-benefits strategies at the regional scale.
- The LRTAP Convention is considering how far short-term climate forcers can be incorporated in the Review of the Gothenburg Protocol which currently regulates air pollution across the region. If this could be achieved it would provide an instrument for targeting resources on urgent climate and air pollution priorities, such as slowing the rate at which the Arctic Ice-cap is melting.



## Stockholm Conference On Climate-Air Pollution Co-Benefits: Key Conclusions

Current science emphasises the urgent need to address air pollution and climate change in an integrated way to achieve sustainable development and a low-carbon society.

Though commonly viewed as 'conventional' air pollutants, ozone, black carbon and methane together have an important warming effect on the climate. Urgent action to decrease atmospheric concentrations could not only yield significant benefits from reduced air pollution (eg to health and crop-yields) but also help slow global warming and avoid crossing critical temperature and environmental thresholds.

Air pollution abatement policies necessary to reduce aerosols to protect human health and the environment, will lead to the unwanted affect of accelerated warming, because of the removal of the 'cooling' effect of these aerosols on climate. This could be alleviated by reducing the short-lived warming agents (methane, ozone and black carbon), and emphasises the urgent need to decrease concentrations of these substances. Decreasing concentrations of methane, ground-level ozone and black carbon should occur alongside CO<sub>2</sub> emission cuts and the required climate change adaptation measures.

A range of integrated assessments and analyses around the world highlight that GHG mitigation costs are lower due to cost savings on air pollution control, and benefits of GHG mitigation are greater due to reduced air pollution impacts. For example, recent assessments for Europe and parts of Asia found that a 20 per cent decrease in CO<sub>2</sub> emissions could lead to about a 15 per cent fall in air pollution-induced deaths, with considerable associated cost savings.



*Discussions during coffee break*

The current priority for many developing countries is poverty eradication and sustained economic development, and, in support of this, improved air quality. This work should be integrated with the GHG mitigation to achieve win-win solutions.

The national level may be the most important for the development of co-benefit strategies. Countries which do not yet have well-established systems of air quality regulation have the opportunity to develop groundbreaking integrated systems more efficiently and cost-effectively than countries where well-established air pollution control systems are already in place.

Existing regional air pollution networks can play an important role in linking the climate and air pollution communities at different scales and in sharing expertise.



*Stockholm Conference participants, September 2008*





## GLOBAL ATMOSPHERIC POLLUTION FORUM

At the 13th World Congress in London in 2004, the Union brought together for the first time all the main inter-governmental and non-governmental organisations concerned with air pollution at the regional and hemispheric scale. The aim was to develop an informal network in which they could work together, harmonise their programmes and promote the development of more effective systems for the management of air quality at regional, hemispheric and global scales. In partnership with the Stockholm Environment Institute, and with the support of UNEP and the UNECE Convention on Long-Range Trans-boundary Air Pollution, the Forum has been developed as a major force for promoting more effective international co-operation on air pollution.

A key step in the development of the Forum was agreement by the Swedish International Co-operative Development Agency in 2006 to fund a major programme of work in the following fields:

*Promotion of regional cooperation on air pollution.*

*Technical cooperation and harmonisation between regional air pollution networks.*

*Cooperative action on hemispherical and global air pollution.*

Four years on, this phase of the Forum's work is coming to a culmination with the achievement of many of its goals in each of these fields. This report surveys the progress so far and describes the next challenges.

### Promotion of Regional Cooperation on Air Pollution

In co-operation with UNEP and other regional partners the Forum has now successfully promoted three regional air pollution agreements at ministerial level for Sub-Saharan Africa, resulting in the Lusaka Agreement in Southern Africa and the Nairobi Agreement in Eastern Africa in 2008, and the Abidjan Agreement in West and Central Africa in 2009. With these agreements in place, the next task for the Forum will be to consider how capacity building networks to underpin the agreements can be promoted and made sustainable, how links to climate change issues can be pursued, and to what extent the regional agreements can be harmonised.

In Asia the regional air pollution networks in Asia have agreed to establish a joint forum to work together in addressing air pollution issues. During 2010, countries will agree on an implementation plan for the Joint Forum for closer cooperation among regional air pollution networks in Asia-Pacific.

Two major steps remain, in North Africa and Latin America. Following the successful meeting of experts from North African states in Tunis last November 2009 proposals for a framework agreement and inter-governmental network will be



*Panama City 2009. First meeting of the Latin American and Caribbean Network on Air Pollution*



*Lusaka 2008. Ministerial meeting which produced the First Regional Policy Framework for Air Pollution in Southern Africa*

submitted to a forthcoming meeting of Ministers from the region. In Latin America, the Regional Forum of Environment Ministers has already agreed in principal a proposal for a Network. Following detailed discussions at two meetings of officials in 2009, interim recommendations went to Ministers earlier this year (2010). They have requested further work and preparation of a regional action plan for their next meeting.

At the same time the Forum is following - and contributing to - the debates within the LRTAP Convention on its future strategy. While there remain important air quality challenges for the Convention to address within the UNECE Region, it seems likely that the Convention will shift its focus increasingly to climate pollution interactions and co-benefits and to links with other conventions and with other regional air pollution organisations - steps which other Forum partners would warmly welcome.

### **Technical Cooperation and Harmonisation Between Regional Air Pollution Networks**

The Forum aims to promote convergence in the technical methods and guidelines used by the different regional initiatives around the world as the scientific basis for policy making, and to enhance international air quality management through the use of these guidelines in coordinated projects in different parts of the developing world.

Harmonised approaches are being developed for all stages in the air pollution policy cycle: emissions, monitoring, impact assessment and

policies, all of which are essential to underpin an effective policy process. The GAP Forum Emissions Manual has already been successfully launched and this is being followed in 2010 by manuals on monitoring air pollution to assess impacts, manuals for the assessment of crop and corrosion impacts, and on cost-effective epidemiological studies for assessing health impacts. All manuals are designed to be as compatible with best international practice as possible and targeted for implementation in developing countries.

### **Cooperative Action on Hemispherical and Global Air Pollution**

The aims of this series of activities is to build awareness and cooperation at regional, hemispheric and global scales between the different regional groupings, and to promote consensus among them on key common issues through sharing information and undertaking joint policy assessments.

Two key strands of this programme are set to come to fruition this year. The Global Assessment of Black Carbon and Ozone sponsored and led by UNEP, which was stimulated by the Forum's work on Climate-Pollution interactions and co-benefits, is expected to be completed during the year.

In addition the Forum will publish a discussion paper on proposals for strengthening international co-operation on air pollution. This will draw together conclusions from the Forum's work over the past six years. Its implications for the future programmes and priorities of IUAPPA and its partners in the Forum will then need further discussion.



# Looking Forward

*Major new scientific and policy issues relevant to IUAPPA's work are continually emerging. Here we highlight a number which are likely to require consideration in the next few years.*

## Regulation: Tackling the Key Issues

As economic pressures increase in the developed economies, so too will challenges to the value of environmental regulation. Its effectiveness may also be questioned as air quality in some cities fails to improve in the way forecast or targets prove impossible to meet. Here we identify some of the issues on which IUAPPA may need to focus in the next few years.

### Limit Values and Legal Enforcement

In the United States and more recently in the European Union we have gone down the route of seeking to require national and state administrations to achieve specific target values for air pollutants - rather than the softer approach of requiring authorities simply to use their best endeavours to attain them. Not infrequently - as now with NO<sub>2</sub> in Europe - these limits are found to be in practice unattainable, but amending legal obligations is fraught with delays and difficulties. Meanwhile important economic and infrastructure programmes (for example expansion at Heathrow and the Port of Rotterdam) risk being delayed by them. We are uncomfortably aware that monitoring is always partial and inexact, and single limits the result of negotiation as much as science. But is there any alternative if the pressure to reduce pollution is to be maintained?

### The Wider Issue of 'Personal Exposure' and 'Hotspots'

Our current strategies are mainly focussed on 'hotspots'. We aim to identify areas where air quality is regularly poor and concentrate improvement there. But personal exposure through time and space is more complex and few people are continually exposed through their lives in these areas. More importantly, making improvements in 'difficult' areas may be more costly and yield lower overall health benefits

than acting on air quality across a wider area. On a number of fronts in Europe - and to some extent in North America - regulators have been addressing this issue. Are the adjustments to the system working, and have they gone far enough?

### Dealing with 'Natural Background'

In the European Union most standards and limit values have been set, historically, on the basis of conditions in Northern and Western Europe. It has seemed a sufficient argument for their general application that limits and standards are 'health-based'. But what if those standards are simply inappropriate not just to desert areas but even to the more 'dusty' areas with predominate in Mediterranean Europe? This local European issue opens up a much wider and more general issue. Universal standards have an obvious allure, but climate and topography vary and races and cultures have adapted to their conditions over centuries and millennia. So perhaps we should accept more variability, accept 'horses or courses'. But in a globalised world of free movement and cultural convergence?

### Technology and the effects-based approach

Lurking behind these issues is one that has been there almost from the start. Should regulatory systems work fundamentally through technology, for instance by mandatory emission standards? Or should the emphasis be on the effects-based approach and ambient air quality. Regulatory systems must balance the two, but we know that emissions control technology remains overwhelmingly the most effective instrument in the hands of air quality planners, and that ambient quality is continuously varying and more difficult to measure and generalise. The two approaches may be a matter of looking through different ends of a telescope, but perspective is everything: are we getting the balance right?



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## Air Pollution and Eco-System Services

Ecosystem services are the benefits that humanity receives from the natural world. These include, at a most basic level, food, fuel and materials for building but there are also the benefits of protection against pests and of flood protection. The enjoyment people find in nature is another service that comes from ecosystems. The natural world provides things of extraordinary value; pollination is almost invisible to most people, but essential for food production and without it we would soon cease to exist.

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***“For IUAPPA and its member organisations, the preservation of ecosystem services is likely to become a major concern in the next three years”***

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Ecosystem services are essential for the future of mankind yet pressures on the ecosystems that provide them are intensifying. Ecosystems worldwide are under threat from human activity, from climate change, from increasing use of land and from pollution. The economic effects of this are large; the loss of bees in parts of America has had a devastating effect on agriculture as crops cannot be pollinated.

For IUAPPA and its member organisations, the preservation of ecosystem services is likely to become a major concern in the next three years. The issues links strongly to the IUAPPA agenda and provides yet more reason to be active in urging reduction of air pollution and the agents of climate change.

Not only are ecosystem services effected by high levels of air pollution and climate change but, under more normal conditions, nature itself provides the most cost effective possible regulation of air quality and climate. The effect of air pollution on natural systems was the main driver for agreements to control acid rain in Europe and remains one of the most important drivers of efforts to control photochemical pollution worldwide.

The natural systems at stake not only provided food but also provided a range of other services, including storage of carbon and protection against natural hazards, floods and landslides, for example.

Well maintained and healthy natural systems can also provide direct protection against environmental threat, for example trees play a major role in filtering out urban air pollution and protect people living in tree-lined streets from some of the effects of traffic fumes. As the climate warms, urban areas become particularly vulnerable but green spaces in towns and cities mitigate to some extent the worst of the urban “heat island”.

There is, then a good reason why IUAPPA should concern itself with ecosystem services; they are essential and protect against environmental threats but the ecosystems that provide them need protection themselves from overdevelopment and pollution. This is admittedly a complex issue but one well suited to the science based approach of IUAPPA and its member associations.

The questions that will naturally arise, for example, are about the ways in which needs for land can be satisfied without sacrificing ecosystem services and the ways in which the value of ecosystem service can be weighed into cost benefit analysis of pollution control strategies.

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## A New Framework for Global Atmospheric Pollution?

Since 2004 IUAPPA has played a leading role in promoting debate on strengthening international co-operation on air pollution at the regional, hemispheric and global scales and numerous other initiatives have since then served to emphasise the importance of the issue, including the Hemispheric Air Pollution Task Force, the Royal Commission Report on Ozone, the Atmospheric Brown Cloud Programme and the work of the GAP Forum. All make clear the increasing importance of this scale of air pollution policy.

It is clear that formidable challenges remain to be tackled: the absence of a framework for addressing the most damaging regional and hemispheric pollutants (aerosols, ozone and methane); the inadequate links between air pollution and climate change policy; and the absence of a 'global voice' to highlight the importance of air pollution, identify important emerging issues and speak for air pollution in international environmental and political fora.

Action in this area faces many difficulties: political constraints unrelated to air pollution; the costs of action, and the inevitable competition for economic advantage; the delays and complexities in all international processes; inter-organisational rivalries and vested interests; and the sheer complexity of the issues. But organisations such as IUAPPA must make the case for action - and there will be major opportunities in the next few years.

### The Starting Point

IUAPPA and its partners in the Global Forum have already started thinking hard. A forthcoming report identifies three broad possibilities which need to be further explored in the next few years.

The first, setting up a new, more comprehensive treaty system, has obvious appeal, but might just increase complexity and delay. Long and sometimes complex negotiations would be involved, with many vested interests, no certain prospect of success and, probably, little political priority.

By contrast, a second option, bringing air pollution within the remit of UNFCCC, would require relatively little institutional change, and would recognise that the main pollutants for which there are no adequate negotiating and policy mechanisms (ozone and aerosols) are also climate forcers. But already faltering climate negotiations would be over-burdened, the intractable political problems of climate policy might be imported into air pollution policy, and there would still be no obvious mechanism to address non-climate forcing pollutants.

A third - and probably more realistic option is to build on existing regional and global air quality networks and agreements. This might, for instance, involve moving the LRTAP Secretariat from UNECE to UNEP, to give a unitary air pollution body that might best be serviced through the UNEP Office in Geneva, to capitalise on existing expertise and allow links with WMO and other relevant atmospheric institutions. This institutional change could be complemented by a global framework agreement, perhaps achieved through opening up the LRTAP Convention to all UN member states.

### Opening Up Options

All these options need exploration and debate, which IUAPPA can continue to lead. But it will be important for IUAPPA and its partners to focus also on shorter-term measures where practical progress can be made, even if they fall short of providing the coherent global framework which will ultimately be needed. There are four, in particular, which the Union may need to keep on its agenda in the next few years:

- **Further strengthening of regional air pollution networks** - and exploring how far they should also cover climate-pollution interactions.

- **Promoting closer co-ordination among international monitoring and assessment programmes**, for example, between WMO and the European Monitoring and Evaluation Programme.

- **Defining the content of a Global Air Pollution Framework Agreement**. This could be easily done on the basis of a review of the effectiveness of provisions in current treaties and protocols.

- **Climate-Air Pollution Co-benefits**. Making clear to politicians and public the potential scale of cost saving from integrated strategies.

# Strengthening the Union

## The Review Process: Progress So Far

As the President emphasised in the introduction to this review, the Union is operating within an environment changing more rapidly than ever before. This makes it essential that the Union continually review the way it operates to ensure that it remains relevant and effective. Responding to an extensive survey of the activities and aims of member organisations prepared in preparation for the Brisbane Congress, the International Board established a Review Committee to explore ways to strengthen and expand the Union's activities, membership and structure.

Over the last two years a broad consensus has been emerging on some of the important issues and it is hoped to reach agreement on further developments at the 2010 Board Meeting. Some of these issues are, inevitably, detailed matters of organisation and practice of little general interest, but here we summarise three of the main conclusions which are likely to influence the Union's general style and approach over the next few years.

### Expanded Membership

Widening IUAPPA's membership is essential to its ability to achieve its objectives. It is also important that they be drawn from a wider range than at present, to reflect the way environmental organisations have changed and diversified in the last 40 years. In addition to allowing more than one member organisation from any given country, consideration should be given to welcoming government and inter-governmental entities, international research institutes, regional NGOs, and other bodies committed to clean air, including appropriate international companies and other commercial organisations which can demonstrate such commitment.

It is important, however, that widening and diversifying membership in this way should not make the Union's membership structure more complex and cumbersome. Simplicity and clarity should be priorities.

## Meetings

The Review Committee saw great merit in the Union's regional conferences, but potentially in a variety of other kinds of meeting also, including workshops, speciality meetings and seminar programmes. The implication is that in designing meetings there is no reason why the Union should restrict itself to one or two models, though they will clearly want to replicate and build on successful approaches. More fundamentally, the implication is that the essential criterion should not be that the project design fits specific pre-existing criteria, but that what is proposed is relevant and effective in terms of the Union's objectives for the meeting.

*“Widening IUAPPA's membership is essential to its ability to achieve its objectives”*

## World Congresses

Broadly similar conclusions have emerged on Congresses:

- There should be flexibility in the timing - a three year interval should not be regarded as mandatory but timing could be adjusted to reflect circumstances and opportunities.
- The Secretariat should take a stronger role in the organisation of the World Congress, to allow greater consistency and continuity in the programme and more flexibility in the choice of venues.
- The global relevance of the meeting should be enhanced by taking opportunities to involve other international organisations - governmental and non-governmental - as sponsors and partners.

There was however no doubt as to the value of the World Congresses. Much of this importance rests on the fact that they are one of the few major meetings which covers all aspects of atmospheric science and policy - and indeed some other environmental issues as well. In a world of increasing specialisation they allow the participant to take a broad view of the whole field of atmospheric science and policy and to identify opportunities and priorities.



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## Moving Forward

The Union's development is inevitably seen to flow in the three year periods which lie between World Congresses and mark Presidential terms. History is never so neat. There are issues and programmes covered in this report which will continue for some years, and many elements of the programme for the next period are already settled.

The Gap Forum through which the Union has pursued many of its aims and goals on international and trans-boundary pollution has achieved much in the last three years, but cannot claim that its work is even near to completion. As is evident from the report in this review, our seminar programme on reducing the impact of transport on air pollution in mega-cities has covered much ground but, as the Board decided last year, there remain useful ways in which it could, and should develop. With many of our member associations firmly persuaded of the importance of climate-air pollution co-benefits, this must surely remain a central feature of our agenda. In turn, these major initiatives are built upon an enduring bedrock of scientific presentations and policy discussions across all aspects of air and environment quality.

.....  
***“How the Union can become more relevant and effective is an issue that needs to be continuously reassessed”***  
.....

Yet it is important to ask whether there are new issues and problems which should become priorities for us, or, at least enter our agenda for the next few years. This is a question that can only be determined by the Board and member associations over the coming months, but this, at least, is the place to pose some of the questions.

The last section of this review identified three such issues:

- Are there fundamental issues in the way in which we seek to regulate air quality which need to be readdressed?
- The concept of 'Ecosystem Services' could have a major impact on the way we think about our environment, economy and society. How should air quality be positioned in this debate?
- There is increasing evidence of hemispheric and global transport of air pollution. Some of the pollutants transported at these scales have damaging impacts on health but remain largely unregulated at the international scale. Where should the Union stand on this?

We could have focused on many others, some equally deserving. The world faces an unparalleled crisis in biodiversity, possibly the most serious of all environmental challenges. Air Pollution plays a part - albeit modest - in this. Is there anything our World association should be doing or saying about this? The links between air pollution and energy and waste are profound: should our conference programmes and policy initiatives more fully reflect this?

At least in our internal organisation immediate priorities are clear. As the President has emphasised, after three years exploring and seeking consensus on such matters as our membership and structure it is now time to take clear decisions and implement them. That will not of course put an end to organisational issues. There are other issues which have still not yet received adequate discussion or credible answers - perhaps most notably how bilateral links and co-operation between member organisations can best be promoted.

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# World Atlas of Atmospheric Pollution

The World Atlas of Atmospheric Pollution was developed in conjunction with the International Union of Air Pollution Prevention and Environmental Protection Associations (IUAPPA) and the Global Atmospheric Pollution Forum (GAPForum) and published by Anthem Press in 2008, to bring together key scientists in the field to provide a global overview of air pollution and its impacts.

Edited by Professor Ranjeet Sokhi of the Centre for Atmospheric and Instrumentation Research at the University of Hertfordshire in the United Kingdom, the World Atlas provides a fascinating overview of air pollution in the 21st century.

The Forward to the World Atlas was written by Nobel Laureate, Mario Molina, and each of the Atlas' seven chapters were written by leading authorities from around the world. Wherever possible, each chapter gives a worldwide view of the state of the atmosphere.

## History of Air Pollution

Dr Peter Brimblecombe, University of East Anglia (UK)

## Air Pollution in Towns and Cities

Drs Ranjeet S Sokhi, (University of Hertfordshire, UK), Nutthida Kitwiroon, (University of Hertfordshire, UK)

## Long-Range Transport of Atmospheric Pollutants and Transboundary Pollution

Coordinating author: Dr S T Rao, (National Oceanic and Atmospheric Administration/U.S. Environmental Protection Agency, USA)

Co-authors: Drs Christian Hogrefe (University at Albany, USA), T Holloway (University of Wisconsin-Madison, USA) and George Kallos (University of Athens, Athens, Greece)

## Global Air Pollution

Dr Ding Yihui, (IPCC, National Climate Centre, China)

## Ozone Depletion

Dr Richard S. Stolarski, (NASA Goddard Space Flight Center, USA)

## Environmental and Health Impacts of Atmospheric Pollution

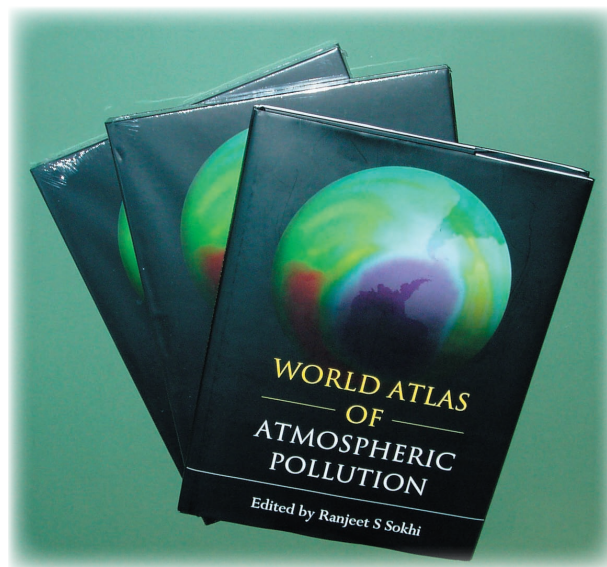
Coordinating author: Dr Mike Ashmore (University of York, UK)

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Centre, The Netherlands), L van Bree (Netherlands Environmental Assessment Agency, The Netherlands), and K Hicks (Stockholm Environment Institute, University of York, UK)

## Future Trends in Air Pollution

Dr Markus Amann (International Institute for Applied Systems Analysis - IIASA, Austria), Janusz Cofala (IIASA, Austria), Wolfgang Schöpp (IIASA, Austria), Frank Dentener (Institute for Environment and Sustainability, Italy)



The World Atlas of Atmospheric Pollution is an important source of information for environmental professionals, scientists, consultants, city officials, air quality experts, industrialists, students, and policy-makers across the world. Topics in the Atlas are presented in a way that makes it accessible to the non-expert as well as to the more informed reader.

The World Atlas is full colour throughout its 144 pages, with over 150 maps, photographs and illustrations. It is comprehensively referenced and indexed. The World Atlas is published in hard cover, 363 mm x 269 mm. ISBN 978 184331 289 5.

**The World Atlas is available from IUAPPA at the discounted price of £98.00 including worldwide postage and packing.**

To order one or more copies of the World Atlas on Atmospheric Pollution anywhere in the world outside of North America, using a debit or credit card, log on at [www.iuappa.com](http://www.iuappa.com) and follow the on screen instructions. To order copies in North America, visit the Air and Waste Management Association website, [www.awma.org](http://www.awma.org).

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