Global Atmospheric Pollution Forum

Air Pollution and Climate Change: Developing a Framework for Integrated Co-Benefits Strategies

Conclusions and recommendations from an international conference of experts held in Stockholm in September 2008 under the auspices of UNEP and the UN ECE Convention on Long-range Transboundary Air Pollution, and in consultation with the UN FCCC secretariat

1. Current science emphasizes the urgent need to address air pollution and climate change in an integrated way. In both developing and industrialized countries, abatement of air pollution and mitigation of climate change have generally been treated separately. There are, however, large benefits in considering the control options together as we strive to achieve sustainable development and a low carbon society; such approaches would mostly lead to increased health and/or climate benefits and decreased costs.

2. Global climate change results primarily from 150 years of carbon dioxide (CO_2) and emissions of other climate warming substances many of which are air pollutants. Recent studies indicate that 13 to 90 per cent, with a central value of 40 per cent, of the warming by GHGs in the atmosphere is presently being masked by certain aerosols (and aerosol-cloud interactions) that increase the reflection of sunlight. These aerosols result from air pollution emissions (see para. 9 below).

3. The current priority for many developing countries is poverty eradication and sustained economic development and, in that context, to improve air quality and the health of its citizens as part of development policies. An integrated co-benefits approach could achieve win-win solutions and, indeed, some countries in different regions are already explicitly integrating air pollution controls and GHG mitigation.

4. A range of integrated assessments and analyses around the world highlight that GHG mitigation net 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_2 emissions could lead to about a 15 per cent fall in air pollution-induced deaths, with considerable associated cost savings.

5. Ground-level ozone and black carbon aerosols are air pollutants that also act as warming agents (see para. 8 below). Methane is a precursor of the formation of ground-level ozone as well as a GHG. Urgent action to decrease the concentrations of ozone, black carbon and methane in the atmosphere could provide opportunities, not only for significant air pollution benefits (e.g. health and environmental benefits) but also for rapid climate benefits by helping to slow global warming and avoid crossing critical temperature and environmental thresholds. The substances are relatively short-lived in the atmosphere (compared to CO_2), lasting from days to weeks (ozone and black carbon) to a decade (methane) and so decreasing their concentrations by cutting emissions could produce relatively quick climate benefits. However, achieving this would require careful consideration, extensive commitment, and regional and global cooperation.

6. Together, methane, ozone and black carbon aerosols comprise a major warming component compared with CO_2. According to the Intergovernmental Panel on Climate Change (IPCC), the mean anthropogenic radiative forcing resulting from all GHGs is estimated to be +3.05 W m^{-2} of which methane accounts for +0.48 W m^{-2} and tropospheric ozone for +0.35 W m^{-2}. In addition, it is estimated that black carbon accounts for +0.34 W m^{-2} in the atmosphere and an additional +0.1 W m^{-2} on snow. Regionally, however, black carbon heating effects can rival that due to increases in CO_2, for example, in the Arctic and the Himalayan-Tibetan glacier regions.

7. Decreasing black carbon emissions from the majority of diesel engines is effective and practical and there are other promising opportunities for black carbon reductions in both industrial processes and the uncontrolled burning of biomass. Opportunities for decreasing emissions of methane and other ozone precursors in industry, agriculture, mining and transport are widely recognized and relatively inexpensive. Ozone reductions are best achieved

by cutting emissions of all precursors which include nitrogen oxides and volatile organic compounds as well as methane. Studies show that reduction in nitrogen oxides alone, without reduction in methane or volatile organic compounds, does not result in climate benefits.

8. Decreasing concentrations of methane, ground-level ozone and black carbon should occur alongside (not in lieu of) CO_2 emission cuts and the required climate change adaptation measures.

9. Air pollution abatement policies that decrease sulphate and some other aerosols to help protect human health and the environment, will produce unwanted acceleration of warming because of the 'cooling' effect of these aerosols on climate. This warming could be alleviated to some degree by reducing the short-lived warming agents, methane, ozone and black carbon, as described above (para. 7), and emphasizes the urgent need to decrease concentrations of these substances.

10. Among air quality policies, structural change, for example through replacement of fossil fuels by renewable energy sources, could provide greater climate and air pollution co-benefits than the traditional end-of-pipe technologies.

11. The national level may be the most important for the development of co-benefit strategies, since the content and focus of such strategies are likely to differ from region to region and country to country. Countries which do not yet have well established systems of air quality regulation have the opportunity to develop ground-breaking integrated systems more efficiently and cost-effectively than countries where well established air pollution control systems are already in place.

12. Existing regional air pollution networks, climate networks, inter-governmental agencies and agreements can play an important role in linking the climate and air pollution communities at different scales and in sharing expertise.

13. Potential co-benefits might have implications for the future development of international air pollution and climate change negotiating and policy processes. It is important that these conclusions be made available to the UNFCCC and relevant air pollution conventions and networks. This could be achieved through their secretariats.

14. It is also critical that these important climate and air pollution co-benefits are made known to negotiators and relevant policy makers at the national level as soon as possible, since they may affect future decisions on abatement and mitigation. The conclusions should be considered and promoted at national and local scales. In the UNECE region, the Convention could play a lead role. In other regions the established networks and agreements could take the lead.

15. To promote broader understanding of the issues it would be helpful if an early, comprehensive review of the issues and available evidence could be undertaken. For example, a body such as the IPCC or other scientific bodies or networks could be invited to develop authoritative reports which draw upon relevant information from the climate change and air pollution communities.

16. To develop co-benefits strategies, enhanced collaboration and communication between key climate change and air pollution stakeholders is essential at international, national and local scales; these may include government departments and industry.

17. A substantial programme would be needed to enhance and build capacity to implement co-benefits approaches; this should start with raising awareness and understanding among key stakeholders. As part of this programme, there would be a need to provide the necessary tools and assistance for work at regional and national scales to undertake the necessary modelling, assessments, planning, etc.

18. Addressing all of these issues would require the urgent mobilization of significant resources. However, such investment will be highly cost-effective.