

Policy Implications of the HTAP 2010 Assessment

A technical note prepared for the 28th session of the Executive Body by the Co-Chairs of the Task Force on Hemispheric Transport of Air Pollution (TF HTAP) upon request of the EMEP Steering Body 47th session (13th to 15th September 2010)

The TF THAP has finalized its HTAP 2010 assessment on intercontinental transport of air pollution in the Northern Hemisphere.¹ This scientific assessment covers ozone and particulate matter (Part A), mercury (Part B) and persistent organic pollutants (Part C). In addition, a synthesis report (Part D) provides answers to policy relevant science questions identified by the TF HTAP. An Executive Summary of the assessment has been submitted to the Executive Body for its consideration (see ECE/EB.Air.2010/10). This technical note further extracts the policy messages for the Executive Body relevant for consideration in the revision of the protocols, the Long-Term Strategy, and the EMEP work plan. This note has been reviewed by the EMEP Bureau before being submitted as an informal document to the Executive Body.

Gothenburg Protocol (GP)

Decreases in emissions of NO_x, VOC, CH₄, CO, SO₂, PM, and black carbon will contribute to the achievement of the goals of the Gothenburg Protocol and the Convention. Reporting and mitigation of anthropogenic emissions of these pollutants merit further consideration.

Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOC)

Further decreases in emissions of NO_x and VOC are needed within and outside the UNECE to achieve the ecosystem and human health protection objectives in the Gothenburg Protocol.

Methane (CH₄)

Methane is an important precursor for tropospheric ozone. The benefits of methane reductions are global, do not depend on location of emissions, and take several decades to be fully realized.

The TF HTAP has not assessed the availability and cost of methane controls within or outside the UNECE. From other studies, however, it is known that significant methane emission reductions are available globally at a low cost or net savings.

Recognizing that methane is being addressed under the UNFCCC, the LRTAP Convention should consider means and potential of addressing methane as an ozone precursor within the context of the Convention.

Carbon Monoxide (CO)

CO emissions contribute to the intercontinental transport of ozone, but the contribution is smaller than for CH₄, NO_x, and VOC. Land transportation is the largest source of CO emissions within the UNECE. The LRTAP Convention should consider means and potential of addressing CO as an ozone precursor within the context of the Convention.

¹ The full report is available on the TF HTAP website at <http://htap.icg.fz-juelich.de/data/Assess2010>

Particulate Matter (PM) and Black Carbon (BC)

Model results indicate that intercontinental transport of BC (and other PM components) has a relatively small impact on annual, region-wide average ground-level concentrations and deposition, but a more significant impact on total column burdens and, hence, on radiative forcing. Observational evidence suggests that the impacts of BC transport can be large during transport events associated with open biomass burning, e.g. forest fires and agricultural waste burning.

Model results suggest that emissions within the UNECE region are the largest sources of BC deposition in the Arctic, where BC contributes significantly to climate warming. About half of the contribution from the UNECE region to the Arctic comes from open biomass burning and the other half comes from other anthropogenic sources.

These findings corroborate the findings of the Expert Group on Black Carbon along with their relevance for the Gothenburg protocol revision.

Heavy Metals Protocol

The HTAP 2010 assessment acknowledges the global nature of mercury transport. The impact of mercury depends on the chemical species of mercury emissions, since reactive mercury tends to be deposited more regionally than gaseous elemental mercury. Furthermore, human exposure to mercury is primarily through the consumption of contaminated fish, which may come from local or very distant water bodies, adding complexity to the assessment of the benefits of mitigation measures.

Mercury emissions outside the UNECE play a dominant role in the global transport of mercury. In particular, increased use of coal without abatement of mercury emissions may increase the global atmospheric mercury burden significantly.

The benefits of decreasing emissions of reactive mercury species, which deposit within the UNECE region, warrant further consideration. Information on speciation of mercury emissions should be collected in view of the importance of such species for regional deposition of mercury.

The findings of the TF HTAP 2010 assessment should be communicated to UNEP Chemicals, in particular in the context of the ongoing negotiations for a legally binding instrument. Further the Executive Body should consider ways to enhance the science and policy cooperation with UNEP on "un-intentional releases" of mercury.

POPs Protocol

The findings of the 2010 HTAP assessment confirm the global nature of transport of POPs. The integrated approach combining data on emission inventories, basic chemical-physical characteristics and observations with multi-compartment models can provide policy relevant information on the potential of intercontinental transport of legacy and new POPs.

The work of the TF HTAP is closely interlinked with Stockholm Convention (and EU REACH regulation) which focused mainly on emissions from commercial production and use of chemical products.

The Executive Body should acknowledge the global nature of POPs transport and the important inter-linkages with the Stockholm Convention on POPs.

The findings of the HTAP 2010 assessment should be communicated to the Stockholm Convention, inviting that Convention to close cooperation on science and policy.

Releases of POPs that fall outside of the scope of the Stockholm Convention warrant further consideration within the UNECE for future action.

Long Term Strategy of the Convention

The UNECE region has more than 30 years of experience in dealing with air pollution issues at the regional scale, and the Convention has worked to share this experience with other regions, which face common issues as well as challenges particular to their regions. The TF HTAP has engaged extensively with experts and organizations outside the UNECE region. This informal cooperation has been of mutual interest and benefit for the Convention and other organizations.

Although emissions are likely to decrease in the UNECE region over the next 20 to 40 years, they may increase globally. The relevance of intercontinental transport of air pollution is therefore likely to increase in the near future. To decrease sources of intercontinental transport of air pollution into the UNECE, the Parties to the Convention, individually and through the Convention's subsidiary bodies should work to strengthen air quality management efforts in other regions of the world.

The formation of a global framework for cooperation on air pollution issues and the Convention's role in such a framework merit further consideration. Such a framework may take the form of a confederation of, or partnership between, existing regional efforts that could facilitate information exchange, provide mutual support, and facilitate linkages between relevant regional and global institutions.

The Executive Body should consider developing an explicit information management strategy to improve the interoperability and efficiency of data systems developed and maintained by subsidiary bodies of the Convention and to improve the exchange of information with relevant efforts outside the Convention, contributing to and benefiting from the development of the evolving Global Earth Observations System of Systems.

2011 Work Program

The TF HTAP has explored the use of source receptor relationships and source apportionment in the assessment of intercontinental transport, predominantly with the aid of global models. The TF HTAP has also compiled and assessed relevant observational evidence from surface networks, field campaigns, and satellites, as well as a new global emissions inventory incorporating information from national and regional inventories. The TF HTAP has also begun to develop automated linkages between relevant information systems to facilitate integrated analysis and information exchange. Furthering our understanding of the importance of intercontinental transport will require significant joint efforts between experts on emission inventories, field and laboratory studies, monitoring, modeling, and impact assessment, all of which are activities covered by the Convention's work program.

The Executive Body should consider amending the Convention's work program to target specific questions and recommendations identified by the HTAP 2010 assessment. These include:

Emissions (Section 2.1)

Contribute to the development and evaluation of emission inventories at the global scale, including the use of ground-based and satellite-based observations and inverse modeling to develop comparative emissions or trends estimates

Atmospheric measurements and modeling (Section 2.2)

Prioritize monitoring efforts that are key for understanding and tracking intercontinental transport, including measurements of the vertical distribution of pollution, at high altitude sites, and in areas of continental inflow.

Develop capabilities to perform source apportionment analysis applicable to intercontinental transport

Interlink global and regional models to analyse key processes for intercontinental transport and to assess the role of present and future boundary conditions on regional air quality and deposition levels

Evaluate the performance of regional and global models with data from inventories and observations, including ground-based networks, field campaigns, and satellites and other sources of information not necessarily part of EMEP.

Investigate the importance of shipping and aviation emissions for ozone and PM pollution (including impacts on the Arctic), and share the results of this analysis with IMO and ICAO.

Integrated assessment modeling (Section 2.3)

Analyse and evaluate the availability, effectiveness and costs for control options for ozone and PM pollution across the continents

International cooperative programme on modelling and mapping of critical levels and loads and air pollution loads and air pollution effects, risks and trends (Section 3.7)

Further link the analysis of intercontinental transport to effects work.

Outreach by the CLRTAP

The HTAP 2010 assessment covers a range of air pollution issues with direct or indirect relevance for many national and international organizations. In addition the work of the TF HTAP is directly linked to applied atmospheric science and technology, presently under rapid development. The findings of the TF HTAP are of relevance for these organizations for their further work.

Other organizations should be informed of the work performed under the TF HTAP. Organizations to be considered include

- ***National and regional research programs***
- ***Other regional intergovernmental organizations, such as AMAP, EANET, Malé Declaration, the ASEAN Transboundary Haze Agreement***
- ***Global intergovernmental and nongovernmental organizations, such as UNEP, UNFCCC, WMO, GEO, ICSU, IPCC, IGBP, WCRP***