Overview of CLRTAP activities in Book on Environmental Treaties

Dear colleagues,

Last August a comprehensive book was published on international environmental treaties, conferences and regulatory institutions with regard to chemicals. In this book an overview of the activities of the Convention on LRTAP is given in chapter 10 of the book. Please note that the chapter in the book represents a personal view and has not been approved by the Convention as a whole.

With this informal document I offer you the complete chapter as an informative document and for further use. You may use the text freely as long as you reference it. The complete reference of the CLRTAP chapter of the book is:

Johan Sliggers, 2011, Chemicals, Environment, Health - A Global Management Perspective, Philip Wexler, Jan van der Kolk, Asish Mohapatra and Ravi Agarwal editors, ISBN: 978-1-4200-8469-6, Chapter 10 - Convention on Long-Range Transboundary Air Pollution, pp 155-169.

I hope you find the document not too far beside the truth and easy to read. And, as said, I hope you may use the text for the further advancement of our Convention.

With kind regards,

Johan Sliggers

10. Convention on Long-range Transboundary Air Pollution

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Introduction

The 1979 Convention on Long-range Transboundary Air Pollution (CLRTAP) celebrated its thirtieth anniversary in 2009. The Convention on LRTAP is the oldest multilateral environmental agreement (MEA) addressing air pollution. It is also a very successful Convention. Under the Convention there are eight protocols, all of which have entered into force. These protocols have helped bring about drastic cuts in air pollution in the UNECE region (United Nations Economic Commission for Europe).

All Parties to the Convention on LRTAP are committed to reducing air pollution in general, and in particular long-range transboundary air pollution. Article 2 of the Convention sets out the objective of the Convention (The Conventions Web page):

'The Contracting Parties, taking due account of the facts and problems involved, are determined to protect man and his environment against air pollution and shall endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution' (text of the Convention, p. 2).

The Convention entered into force in 1983. There are currently 51 Parties to the Convention, including almost all UNECE member countries (56). The UNECE region consists of all European countries, extending to the east as far as Kazakhstan and to the west to the United States of America and Canada. The European Community is also Party to the Convention and all of its protocols.

The first section of this chapter on the Convention on Long-range Transboundary Air Pollution outlines the eight protocols under the Convention, and is followed by a description of the organisation and operation of the Convention. The third section deals with the science under the Convention and how policy makes use of this science. The last section looks into the future and discusses the challenges ahead.

Protocols

The EMEP Protocol (Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollution in Europe) is the first of the Convention's protocols. This Protocol, to which almost all Parties to the Convention are Party, secures the funding of the international coordination work of the five programme centres under the EMEP Steering Body. The budget for the coordination costs is shared between the Parties, which pay mandatory contributions according to the UN scale of assessment based on each country's GDP.

The other seven protocols deal with the reduction of emissions of air pollutants. They gradually step up to more advanced protocols with higher ambitions. The first Sulphur Protocol and the NOx Protocol called for an initial cut in SO_2 and NOx emissions to abate acidification, and were followed by the VOC Protocol, which addressed ozone. The Second Sulphur Protocol increased the reduction in SO_2 emissions by setting national ceilings. The Gothenburg Protocol targeted acidification, eutrophication and ground-level ozone. This protocol included reductions for ammonia and further reduced emissions of the substances

covered by the first three reduction protocols by setting national emission ceilings. The Heavy Metals Protocol and Persistent Organic Pollutants Protocol focused on reducing the effects of these substances by banning, restricting and abating them. After the signing of these two protocols the Executive Body wrote to UNEP to encourage it to develop global legally binding instruments for POPs and cadmium, lead and mercury. (See table 10.1 for more information on the reduction protocols.)

Table 10.1. Protocols under the Convention on LRTAP

Protocol	*Key obligations*	*Remarks*
EMEP Protocol, Geneva, 1984	**Financing of EMEP programme by mandatory contributions from the Parties to the Protocol. The EMEP budget covers the coordination costs of the monitoring network, emission data collection, modelling concentrations and depositions and integrated assessment modelling.**	**The scientific cooperation started many years before the Convention was signed in 1979 and could be seen as the forerunner of the Convention. At that time this cooperation was unique in the Cold War era.**
Sulphur Protocol, Helsinki, 1985	**Reduction of 30% SO_2 by 1993 from the base year 1980.**	**The first 'flat rate' reduction protocol. Protocols of this kind with uniform reduction percentages could be called 'first generation protocols'.**
NOx Protocol, Sofia, 1988	**Stabilisation of 1987 NOx emissions by 1994. Mandatory emission limit values (ELVs) for new combustion plants and application of best available techniques (BAT) for new and existing large combustion plants and new mobile sources.**	**Twelve countries declared at the signing of the Protocol that they would reduce their NOx emissions by 30% by 1998.**
VOC Protocol, Geneva, 1991	**Emission reduction of 30% of VOC by 1999 compared to 1988 for all countries except Bulgaria, Greece and Ukraine (stabilisation). Application of ELVs based on BAT for new large combustion plants and new mobile sources. Existing large combustion installations are required to apply BAT. Measures to prevent vapour losses in fuel distribution for motor**	**VOC is defined as all volatile organic compounds except methane. Methane does contribute to ozone formation, however, and both gases are greenhouse gases. Methane falls under the Kyoto Protocol, ozone does not. Of the substances contributing to the greenhouse effect, ozone is third in line after CO_2 and**

Protocol	*Key obligations*	*Remarks*
	vehicles and for products containing solvents.	**methane.**
Second Sulphur Protocol, Oslo, 1994	**Emission ceilings for all member states in 2000/2005/2010. ELVs for large stationary sources and restrictions on fuels.**	**The first protocol with differentiated emission obligations based on the 'critical loads approach', a 'second generation protocol'.**
Heavy Metals (HMs) Protocol, Aarhus, 1998	**National emission levels of cadmium (Cd), lead (Pb) and mercury (Hg) are to be reduced below 1990 levels (or an alternative base year between 1985 and 1995). Mandatory ELVs and BAT for major stationary sources and unleaded petrol and restrictions on mercury in batteries.**	**ELVs are directed towards dust/particles and therefore also reduce other HMs. Apart from the chlor-alkali industry the Protocol does not address mercury from stationary sources.** **After the signing of the HMs Protocol UNEP explored global measures for Hg, Cd and Pb. In February 2009 the Governing Council agreed to initiate a process aimed at producing a legally binding agreement for mercury in 2013.**
Persistent Organic Pollutants (POPs) Protocol, Aarhus, 1998	**Elimination of production and use restrictions for 11 pesticides and 2 industrial chemicals. Mandatory BAT for major sources of 3 unintentionally released substances (dioxins/furans, PAHs and hexachlorobenzene) and reduction of national emission levels of these substances to below 1990 levels (or an alternative base year between 1985 and 1995). ELVs for waste incineration.** **The POPs Protocol has been revised considerably. The amended Protocol has been adopted by the EB in December 2009 (see section 'Challenges and the future')**	**The POPs Protocol can be seen as the father of the UNEP Stockholm Convention on POPs. The Stockholm Convention is clearly inspired by the Protocol. Its structure resembles that of the Protocol. Yet there are clear differences such as the number of substances (now 23 for the Protocol and 19[1)] for the Stockholm Convention, with 5 and 3 in the pipeline respectively), the submission of new substances (review of a dossier or of a substance),** **the extent of the measures and a financial mechanism to dispose of stocks.**
Protocol to Abate Acidification, Eutrophication and	**National emission ceilings for SO_2, NOx, NH_3 and VOC in 2010 for all**	**Like the Second Sulphur Protocol, the emission ceilings are based on**

Protocol	*Key obligations*	*Remarks*
Ground-level Ozone, Gothenburg, 1999	**member states (except Canada and the USA which have no ceilings for NH_3). Mandatory ELVs for new and existing stationary sources and new mobile sources. Restrictions on fuels. Mandatory application of BAT for stationary and new mobile sources. Measures to reduce NH_3 from intensive cattle, pig and poultry breeding.**	**effects (acidification, eutrophication and ozone) and cost-effectiveness, the so-called 'critical loads approach'. The EU National Emission Ceilings (NEC) Directive of 2001 implements the emission ceilings of the Protocol. The NEC directive does not cover the ELVs and BAT of the Gothenburg Protocol.**

[1)] All 19 substances of the Stockholm Convention are all covered by the POPs Protocol. The three isomers of hexachlorocyclohexane (HCH) are counted as one substance (see table 10.3).

Organisation and operation

Executive Body and its main subsidiary bodies

Figure 10.1 shows the organisation of the Convention of LRTAP. At the top is the Convention's decision-making body, the Executive Body. The Executive Body, which is the Conference of Parties to the Convention, normally meets once a year in December. The Parties to the protocols in force also use the Executive Body meetings to take decisions on matters such as evaluations of the protocols or amendments to the protocols.

The Implementation Committee assists the Executive Body. The nine members of the Implementation Committee are appointed by the Executive Body and act on a personal title. The Committee monitors compliance with the obligations in the protocols by the Parties and reports to the Executive Body. As with all international environmental conventions, the tools for enforcing obligations are limited. Nonetheless, the Convention has a good record with respect to the implementation of obligations, and the number of cases of Parties failing to comply is falling steadily. The Committee operates on the principle that a cooperative and facilitative approach to those in breach of their protocol commitments is more likely to produce positive results for the Convention and for the environment than a confrontational approach. For the EU countries, compliance is somewhat different. Since the European Community is Party to the Convention and all of its protocols, the European Commission implements all of its obligations in EU legislation. EU member states are thus also bound to the protocol obligations through EU legislation. It is important to note that EU countries do not ratify protocols as a whole. Each EU country is responsible for its own implementation and ratification.

The three main subsidiary bodies under the Executive Body are the Working Group on Effects, the EMEP Steering Body and the Working Group on Strategies and Review. The first two bodies focus on providing scientific grounds for the decisions of the strategy group, which is the policy-making body and therefore negotiates the development and review of protocols. The Convention is well known for its policy-making in close cooperation with science and is often held up as an example (Raes and Swart, 2007). The three bodies and the task forces and coordinating centres under them are discussed in the section 'Science and Policy'.

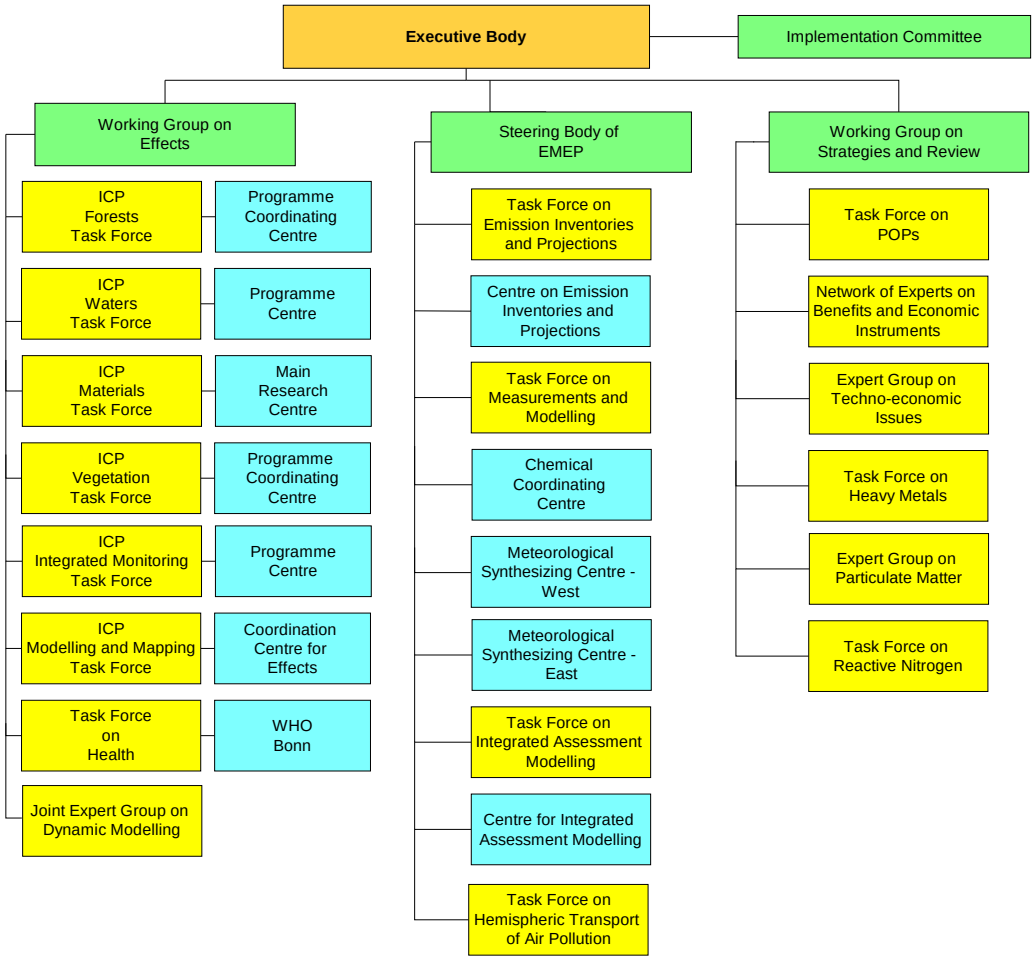

Figure 10.1. Organisational set-up of the Convention on Long-range Transboundary Air Pollution (as of September 2009).

Reporting

The Parties to the Convention and its protocols report their emissions every year. Every two years they also report their implementation of the obligations in the protocols. The Implementation Committee is an important user of these reports.

To assist the Parties with emission reporting, the Convention regularly updates the Emission Inventory Guidebook in which Parties can find simple and more advanced methodologies and emission factors for calculating emissions and emission projections for many substances. The Guidebook provides information on how to calculate emissions. The Guidelines on Emission Inventories specify what data should be delivered and when. From 2009 onwards, the Parties are obliged to produce an Informative Inventory Report to underpin their emission figures. The EU uses the same emission data for its National Emission Ceilings Directive. The Parties also report emission data to the Climate Change Convention. Because there is a significant overlap with climate change emission reporting (some substances are reported to both the CLRTAP and UNFCCC, energy use, activities,

sources etc.), the methodology, the emission data and the inventory report required under the Convention are fully harmonised with UNFCCC requirements.

A 'Strategies and Policies' questionnaire is used for reporting on compliance. Part I of the questionnaire contains questions on the implementation of the obligations of the protocols and has to be answered every two years. Part II of the questionnaire is more general and only has to be answered every four years. Information related to more general policies, such as types of fuels used, energy conservation, economic instruments etc. is collected in this part. In both types of reporting use is made of electronic aids such as templates, the Internet etc.

Consensus decisions

From the start decisions have been taken by consensus, although decision-making in the Convention is officially by majority voting unless the Convention or its protocols specify that consensus decision is warranted, e.g. for the adoption of amendments to protocols. Despite its tendency to dilute and slow down action in tackling the major environmental problems, consensus decision-making is 'efficient' because the Parties are more likely to respect an Executive Body decision if they subscribe to its terms than if they are driven reluctantly into observance by means of a majority vote. Consensus decision-making has proven itself but it can only work if Parties use it to find solutions. It often means that one has to find innovative and flexible solutions and the Convention is well known for that. However, sometimes Parties use it as a veto to block progress.

Implementation and ratification

The strength of the Convention and its protocols can be deduced from its implementation at the national level (see table 10.2). Prior to ratification, countries take all legal and other appropriate measures to implement the obligations in order to ensure compliance with them at the time of entry into force. Ratification is therefore a simple indicator for demonstrating implementation of the legal obligations. The contents of table 10.2 are discussed in more depth in the section 'Challenges and the future'.

Table 10.2. Ratification of the Convention and protocols in different UNECE sub regions (as of 2 September 2009)(ECE, 2007)

Instrument – year of adoption	*EU [1] (28)*	*EECCA[11] (12)*	*SEE[12] (7)*	*Other Europe (7)*	*North America[2](2)*	*Total (56)*
LRTAP – 1979	**28**	**9**	**7**	**5**	**2**	**51**
EMEP[3] – 1983	**28**	**3**	**5**	**4**	**2**	**42**
1st sulphur[4] – 1985	**16**	**3**	**1**	**3**	**1**	**24**
NOx[5] – 1988	**23**	**3**	**2**	**3**	**2**	**33**
VOC[6] – 1991	**18**	**0**	**1**	**4**	**0**	**23**
2nd sulphur[7] – 1994	**22**	**0**	**1**	**4**	**1**	**28**
HMs[8] – 1998	**21**	**1**	**1**	**4**	**2**	**29**
POPs[9] – 1998	**22**	**1**	**1**	**4**	**1**	**29**
Gothenburg[10] – 1999	**21**	**0**	**1**	**2**	**1**	**25**

Numbers indicate the number of states that have ratified each instrument. Numbers in parentheses show the total number of countries in each sub region.

1 These figures include the European Community.
2 The United States has existing national instruments with similar provisions.
3 Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollution in Europe (EMEP).
4 Protocol on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by at least 30%.
5 Protocol Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Fluxes.
6 Protocol Concerning the Control of Emissions of Volatile Organic Compounds or Their Transboundary Fluxes.
7 Protocol on Further Reduction of Sulphur Emissions.
8 Protocol on Heavy Metals.
9 Protocol on Persistent Organic Pollutants.
10 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone.
11 Eastern Europe, Caucasus and Central Asia (EECCA)
12 South East Europe (SEE)

Methodology

The Convention is serviced by a small UNECE secretariat, which administers the sessions and their documentation and helps the bodies carry out their activities under the Convention. What makes the Convention tick is the motivation of the Parties and the people taking initiatives and taking the lead in the work to be done. The work plans of all the working groups, task forces, expert groups and centres are discussed annually throughout the Convention and adopted by the Executive Body. The work in the groups and task forces is usually led by one or two Parties who often contribute significantly to its work, both in terms of manpower and financially. In addition, Parties hosting centres usually contribute additional manpower and financial resources. One can say that the Convention really works bottom-up. Parties' initiatives are usually taken up in scientific programmes and policy-making (protocols, guidelines etc). Parties that are active are rewarded by their influence on the course the Convention is taking.

Financing

The Convention has two important financial mechanisms to support the scientific work being carried out under it: the EMEP Protocol with its compulsory contributions, and the voluntary Trust Fund for the core activities not covered by the EMEP Protocol. The EMEP Protocol sets the financial requirements of EMEP and divides the budget for the coordination work of the five centres under the EMEP programme into Party contributions. Currently, the budget for EMEP is almost $2.4 million per year.

The voluntary Trust Fund sets the budget for the seven centres for effects-oriented work and integrated assessment modelling activities. This Fund also divides its budget into contributions by the Parties, but not all Parties to the Convention pay their attributed contributions. The hosting countries usually pay directly to the centre they host. This accounts for 50% of the total budget of the centres. Roughly 25% of the budget is donated by other Parties directly to the fund. This 25% entering the voluntary Trust Fund has up to now been distributed evenly between the centres. The resulting situation is that some centres receive most of their budget while others are not so well off. The budget for this fund is just over $2.1 million per year.

A third Trust Fund provides support for countries with economies in transition (EECCA and SEE countries) to facilitate their participation in the activities and their implementation and ratification of the protocols. This Fund pays the travel expenses of participants from countries with economies in transition to enable them to take part in the Executive Body and the Working Groups, as well as funding workshops, translations of documents, and so on. The Fund is made up of voluntary donations. However, only a few Parties donate to this

Fund. The Trust Fund is also used for some bilateral projects between several member states of the Convention.

Science and policy

EMEP *Steering Body*

Science has always underpinned the Convention. As long ago as 1974, well before the Convention on LRTAP was signed in 1979, there were meetings of a task force charged with developing a programme for monitoring and evaluating the long-range transmission of air pollutants. Since then the work of the EMEP Steering Body has evolved to what it is today: an important scientific network on emissions, dispersion modelling, coordination of air monitoring networks and integrated assessment modelling, covering five centres (see figure 10.1). The Centre on Emission Inventories and Projections (Austria) collects the Parties' emission data and coordinates the review of the data. The two Meteorological Synthesizing Centres (MSC-West, Norway, and MSC-East, Moscow) use the emission data to model concentrations and depositions of air pollutants, the West centre focusing on traditional air pollutants and the East centre focusing on HMs and POPs. The models are verified and calibrated using monitoring data collected by the Chemical Coordination Centre in Norway. This centre coordinates the pan-European monitoring network. The budget of the EMEP Protocol is for the coordination of the work. The Parties participate at their own expense, i.e. they pay their own travel expenses for attending Task Force meetings**. The Parties also pay for the monitoring sites themselves.**

Integrated assessment modelling

The Centre for Integrated Assessment Modelling is located at the International Institute for Applied Systems Analysis (IIASA) in Austria. IIASA operates the well-known RAINS/GAINS model for calculating cost-effective scenarios, which are used for policy-making (IIASA, 2009). Both the Convention and the EU use this model, which brings together all the knowledge assembled in the Convention. The model consists of the EMEP dispersion model for calculating concentrations and depositions. The model is fed with activities like energy use, types of industrial plant, cars, lorries, livestock farming etc., together with their emissions and abatement possibilities, including costs and emission reductions. The model also contains data on critical loads and levels (sustainable depositions and sustainable concentration levels) for the whole of Europe. The model can calculate the most cost-efficient abatement solution for all kinds of environmental targets. The RAINS model has been used for the Second Sulphur Protocol, the Gothenburg Protocol and the European Union's NEC Directive. In recent years the RAINS model, which covers the major traditional air pollutants, has been expanded to include greenhouse gases - the GAINS model - with the result that it is now possible to calculate integral solutions for both problems or map out the consequences of air pollution policy measures on climate change and, conversely, of climate change measures on air pollution.

Working Group on Effects

Soon after the signing of the first SO2 Protocol in 1985, the Convention started work on the effects of air pollutants. The Working Group on Effects (WGE) is in charge of the effects work under the Convention and is assisted by six International Cooperative Programmes and a Task Force on Health. The Task Force on Health is led by the WHO in Bonn (Germany). Five of the six programmes coordinate an effects monitoring network: Forests, Waters, Vegetation, Materials and Integrated Monitoring. The coordinating centres for these monitoring networks are hosted by Germany (Forests), Norway (Waters), United Kingdom (Vegetation), Sweden (Materials) and Finland (Integrated Monitoring). The ICP

on Mapping and Modelling is responsible for 'critical loads' maps that are used for policy-making. The Coordinating Centre for Effects hosted by the Netherlands gathers the information from its national focal centres (NFCs) and partly from other ICPs, fills in the gaps and produces pan-European maps that are used in integrated assessment modelling. Again, the budget of the voluntary Trust Fund only covers the coordinating activities. The Parties participate at their own expense, i.e. they pay their own travel expenses for attending Task Force meetings. And again, the Parties pay for the monitoring sites themselves. The effects networks play an important role in the policy process. They produce the critical loads and levels that are the basis for further reductions. Also, they monitor the effects related to concentrations and depositions and thus show trends and assess whether policy is successful. Other activities include dynamic modelling to incorporate the time needed for ecosystems to recover, dose-response functions, stock at risk and valuation of stock. These data can be used to calculate damage in monetary terms and thus also the benefits to be obtained when concentrations and depositions decrease.

The EMEP Steering Body and the Working Group on Effects hold regular joint bureaux meetings to harmonise their scientific work. Both bodies have developed a new long-term strategy for 2010-2019. For this purpose they consult the Working Group on Strategy and Review and the Executive Body who set the priorities from a policy point of view. These two scientific legs under the Convention therefore deliver the scientific basis that is used to design and assess policies to abate transboundary air pollution.

Working Group on Strategies and Review

All policy matters are negotiated under the Working Group on Strategies and Review (WGSR). The main task of the WGSR is to review and revise existing protocols and develop new ones. The WGSR also deals with other matters involving policy choices, such as the Guidelines on Emission Inventories and the Guidelines on Effects. The WGSR is supported by the Task Forces on POPs and HMs in respect of matters related to these two protocols. The other four groups play a role in the more traditional air pollutants covered by the Gothenburg Protocol.

Challenges and the future

After thirty years one can say that the Convention is mature and has proved to be an important instrument in the abatement of air pollution in the UNECE region. Many initiatives developed under the Convention have found their way into other conventions and other regions of the world. This is a satisfying observation, but it should not be an excuse to rest on one's laurels. Air pollution is not solved yet. Among the immediate challenges lying ahead for the Convention is the failure of countries with economies in transition to implement and ratify protocols and the revision of the three last protocols. Looking further ahead, when these protocols are revised the Convention will need to update its strategy to cope with the future, the interaction with climate change being the most pressing issue.

Improving the participation of EECCA and SEE countries

An important challenge for the Convention is to encourage Eastern and South-eastern European countries to participate. These countries have emerged from the collapse of the Soviet system, and their current geopolitical context is completely different from what it was in the first ten years of the Convention. These new countries have had to contend with serious economic problems and political instability. As a consequence, they lag behind in implementing and ratifying the protocols of the Convention (See EECCA (Eastern Europe, Caucasus and Central Asia) and SEE (South-Eastern Europe) in table 10.2). The Convention is taking up this challenge in many ways, with projects, bilateral cooperation,

capacity building, meetings in these countries, and above all with the EECCA action plan. A project to stimulate five SEE countries to ratify the three most recent protocols was developed in 2007. Another important initiative to help EECCA and SEE countries sign up to the protocols is to introduce greater flexibility (e.g. more time to implement ELVs for existing installations) in the three most recent protocols, which are currently being revised. A special questionnaire for EECCA and SEE countries published at the beginning of 2009 has initiated momentum in this respect.

The Convention and the European Union

Since the start of the Convention the EU has grown from 6 to 27 countries all of which are Party to the Convention and most of its protocols. Also, the European Community is Party to the Convention and its protocols. The European Commission sees to it that all EU Member States implement all the provisions of the protocols. This growing EU clearly influences the operation of the Convention. With half of the total Parties the EU dominates what happens in the Convention. Most initiatives in the Convention are taken by individual EU countries that first have to persuade the other EU countries and the European Commission before the EU as a whole can submit for instance an amendment to a protocol. EU rules prescribe this just as 'speaking with one tongue' in negotiations. This development over the last few years resulted in much pre-work and coordination between EU Member States and the European Commission. Yet, the Convention largely depends on the EU. Reasons for this are that:

-the countries East and Southeast of the EU have faced severe problems in their economic development and have difficulty in setting up their environmental laws and regulations;

-the United States and Canada often find it hard to agree to international regulations; and

-Norway and Switzerland, the largest of the rest of the countries within the ECE, already follow the directives and regulation of the EU related to environment.

The European Commission increasingly questions the added value of the Convention. As a first priority the Commission feels that especially the EECCA and SEE countries should implement and ratify the existing protocols. Many EU countries share the vision that more ratifications are essential but they also feel that there is still an important role to play for the Convention both in the further development of policy as in the development of the science under the Convention.

Revision of the protocols

The Convention is in the process of updating the three most recent protocols, the POPs Protocol, the HMs Protocol and the Gothenburg Protocol. The objective is to further reduce the effects of air pollutants by taking more measures, updating BAT and ELVs, modernising and streamlining obligations, building in more flexibility for countries with economies in transition, and soon.

The negotiations to amend the POPs Protocol have been finalised in 2009. The Executive Body adopted an amended Protocol in December 2009. The major revisions are: the incorporation of seven substances (the Protocol now covers 23 substances), the updating of Best Available Techniques (BAT) and Emission Limit Values (ELVs) including ELVs for a few new sources, the introduction of flexibility for EECCA and SEE countries, and an expedited procedure to amend annexes in the future. This expedited procedure will enable Parties to opt out of the amendment instead of ratifying it (opting in). Five new substances that were submitted by the EU and Norway in 2008 are currently under review and will therefore not form part of the current amendment of the POPs Protocol. The review of these five substances will be finalised in 2010, after which their inclusion in the annexes of the

Protocol will be negotiated. The expedited procedure to amend annexes will be used for these five substances. The POPs Protocol is the father of the Stockholm Convention (2004), which is modelled after the POPs Protocol. The POPs Protocol continues to drive the Stockholm Convention as can be seen by the substances overview in table 10.3. In this respect it is peculiar to see that the European Commission and some Member States of the European Union question the further progress of the Protocol. One could judge this as a typical example of parricide. Yet, if the Stockholm Convention develops into a well functioning institution and encompasses the substances of the POPs Protocol then there is no more need to update the Protocol with more substances in the future after the incorporation of the five substances in the pipeline.

Table 10.3. Substances in the POPs Protocol and in the Stockholm Convention

Substance	*Type of substance*[1)]	*POPs Protocol*[2)]	*Stockholm Convention*[2)]
Aldrin	**P**	**X**	**X**
Chlordane	**P**	**X**	**X**
Chlordecone	**P**	**X**	**X**
DDT	**P**	**X**	**X**
Dieldrin	**P**	**X**	**X**
Endrin	**P**	**X**	**X**
Heptachlor	**P**	**X**	**X**
Hexabromobiphenyl	**C**	**X**	**X**
Hexachlorobenzene	**C, U**	**X**	**X**
Mirex	**P**	**X**	**X**
Polychlorinated biphenyls (PCBs)	**C, U**	**X**	**X**
Toxaphene	**P**	**X**	**X**
Lindane (γ-HCH) and α- and β-HCH	**P**	**X**	**X**
Polycyclic aromatic hydrocarbons (PAHs)	**C, U**	**X**	
Dioxins/Furans	**U**	**X**	**X**
Hexachlorobutadiene (HCBD)	**P, C**	**X**	
Polychlorinated naftalenes ((PCNs)	**P, C, U**	**X**	
Pentachlorobenzene (PeCB)	**P, C, U**	**X**	**X**

Substance	*Type of substance*[1)]	*POPs Protocol*[2)]	*Stockholm Convention*[2)]
Pentabromodiphenylether (PeBDE)[3)]	**C**	**X**	**X**
Perfluorooctanesulfonate (PFOS)[4)]	**C**	**X**	**X**
Octabromodiphenylether (OctaBDE)[5)]	**C**	**X**	**X**
Short chain chlorinated paraffins (SCCP)	**C**	**X**	**Under review**
Dicofol	**P**	**A**	
Endosulfan	**P**	**A**	**Under review**
Hexabromocyclododecane (HBCD)	**C**	**A**	**Under review**
Pentachlorophenol	**P**	**Under review**	
Trifluralin	**P**	**Under review**	

[1)] The substances can be categorised as P=pesticide, C=chemical use e.g. flame retardant and/or U=unintentional release e.g. burning of wastes.
[2)] X=incorporated in one of the annexes of the POP Protocol or Stockholm Convention. A=accepted as POP but not yet taken up in the POP Protocol.
[3)]Tetrabromodiphenyl ethers and pentabromodiphenyl ethers present in commercial-PentaBDE.
[4)] PFOS and related substances.
[5)] Hexabromodiphenyl ethers and heptadiphenyl ethers present in commercial-OctaBDE.

The review of the HMs Protocol was completed in 2006. Work started on the costs and benefits for a revised HMs Protocol in 2007. In 2008 further work was done to update BAT and ELVs and to address mercury emissions from stationary sources, which are currently not included in the Protocol. In 2008 the EU submitted a proposal to add a number of mercury-containing products to the Protocol. Furthermore, in 2009 the EU and Switzerland submitted proposals to update the HMs Protocol. In December 2009 the Executive Body mandated the WGSR to start negotiations to revise and amend the HMs Protocol in 2010. A revision of the Protocol could be finalised rather quickly, since all the preparatory work has already been done. Furthermore, negotiations for the revision could benefit from the work done for the amended POPs Protocol. The revision could potentially lead to the same kind of improvements as for the POPs Protocol: the updating of Best Available Techniques (BAT) and Emission Limit Values (ELVs) including ELVs for mercury from stationary sources, the addition of certain mercury containing products, the introduction of flexibility for EECCA and SEE countries and an expedited procedure to amend annexes in the future. A revised HMs Protocol with mercury ELVs for stationary sources and more mercury product measures would lead to substantial reductions of mercury emissions in the UNECE region. In addition, the revised HMs Protocol could again have a major impact on the UNEP process to address mercury emissions. UNEP started work on heavy metals after the 1998 HMs Protocol, and in February 2009 the Governing Council of UNEP opted for a legally binding instrument to be finalised in 2013.

In 2007 the review of the Gothenburg Protocol was finalised and work started on its revision. The Parties stated that they wished to incorporate particulate matter (PM) in the Protocol. It is intended that the revised Protocol will have national emission ceilings for 2020 for five substances: SO_2, NO_x, VOC, NH_3 and $PM_{2,5}$. The Parties also called for the synergies and trade-offs with climate change to be taken into account and the Nitrogen

cycle included in the scenario calculations. In terms of the five substances, this would mean a second (NH_3), third (NOx, VOC) or even fourth (SO_2) round of reductions for land-based sources. This is in contrast to emission from ships, an area in which little has so far been done to abate emissions. Further reductions for land-based sources would have been difficult had this situation persisted. Fortunately, IMO decided in 2008 to reduce ship emissions at sea. Two new developments are to attempt to set non-binding aspirational targets for 2050 in line with targets set for climate change and to explore a climate goal for air pollutants because some air pollutants effect our climate as 'short-lives climate substances'. The GAINS model will be used to prepare for the negotiations on the national emission ceilings for 2020. And, of course, the Protocol will be revised with the updated Best Available Techniques (BAT) and Emission Limit Values, flexibility for EECCA and SEE countries and an expedited procedure to amend annexes in the future. The revised Gothenburg Protocol should be ready for adoption by the Executive Body by the end of 2011.

Long-term strategy

In 1999, after the finalisation of the three most recent protocols, the Convention produced a long-term strategy. Following the revision of the POPs, Heavy Metals and Gothenburg Protocols in 2009-2011, this strategy needs to be modified. The first few years would obviously be devoted to the implementation and ratification of the revised protocols with special attention to the EECCA and SEE countries. Now that acidification to a large extend is solved the Convention will need to focus more on health (ozone, particles), nitrogen (biodiversity) and climate change. This calls for a new set-up of the effects related work under the Convention also to contribute more to integrated assessment modelling and cost/benefit analyses. The Convention also has to evaluate how to continue with POPs and HMs. An interesting idea is to follow up on the three protocols around 2020 with just one 'Multi-effects/Multi-pollutants (M&M) Protocol' with BAT and ELVs per sector but without the provisions on the production and use of POPs of the current POPs Protocol. Such a 'M&M Protocol' would also have national ceilings for the major pollutants for 2030 based on integrated assessment modelling and cost/benefit analyses. A very important element in the new strategy would be the relationship between and linkage of air pollution policy with climate change policy. An interesting question in this respect is whether there should still be separate policies for air pollution and climate change in 2030.

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References

The Conventions web page (**http://www.unece.org/env/lrtap/welcome.html**) has a link to the text of the Convention and the text of the protocols. It also provides information on the state of ratifications of the Convention and its protocols and has separate sections on the Executive Body and all the Working Groups and Task Forces under it, including their session documents. There is also a link to the scientific centres under the Convention.

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