European Nitrogen Assessment

Chapter 4: Nitrogen in current European policies

Supplementary Material: International treaties and conventions

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International treaties and conventions

International conventions have played major roles in the establishment of EU policies aimed at decreasing emissions of N to and N concentrations in atmosphere and water bodies. These conventions and their protocols are briefly summarized in this supplementary information to chapter 4 of the European Nitrogen Assessment.

4.S1. Convention on Long-Range Transboundary Air Pollution (CLRTAP)

The establishment of the Convention on Long-Range Transboundary Air Pollution (CLRTAP) laid the ground for policies aimed at protecting air pollution in Europe (UNECE, 2010). The Convention was signed in Geneva in 1979 by 34 Governments (there are now 51 parties) and the European Community, and was the first international legally binding instrument to deal with problems of air pollution on a broad regional basis (UNECE, 2004). A historic overview of the Convention was compiled by Sliggers and Kakebeeke (2004) on the occasion of its 25th anniversary

Table 4.S1. Protocols of the Convention on Long-Range Transboundary Air Pollution (CLRTAP) addressing nitrogen emissions (source: UNECE, 2010).

Protocols	Description / Objectives	Recommendations / Decisions / Targets
Sophia Protocol (NO_X)	Implementation of effective measures to control and/or reduce national annual emissions of nitrogen oxides from stationary and mobile sources.	• National standards should be based on best available techniques; • Specifications in the Technical Annex of the Protocol are recommendatory in character.
Gothenburg Protocol (SO_2, NO_X, NH_3, VOCs)	To control and reduce emissions of SO_2, NO_X, NH_3, VOCs that are likely to cause adverse effects on human health, natural ecosystems, materials and crops, due to acidification, eutrophication or ground-level ozone	• To ensure that in the long term atmospheric depositions or concentrations do not exceed critical loads of nitrogen as specified in Annex I of the protocol; • To reduce emissions in accordance with national emissions ceilings specified in Annex II and VII of the protocol. • To apply limit values for NO_X specified in annexes V and VIII of the protocol. • To apply the ammonia control measures specified in Annex of the protocol IX;

The Convention was established as a framework for future action. It did not contain any specific targets for emissions reduction as there was a political reluctance to enter into binding obligations to reduce emissions (Haigh, 1991). However, as the awareness of serious regional effects of air pollution grew, and as it was realized that more and more countries were affected by transboundary air pollution, the political tide turned. The vehicles chosen to achieve emission reductions were protocols to the Convention (Table 4.S1). Each protocol constitutes an international agreement with signatures that vary from protocol to protocol. The first protocol under the Convention was the 1985 Helsinki Protocol on the Reduction of Sulphur Emissions (also known as the 1985 SO_2 Protocol) (UNECE, 1985). This was followed by the 1988 Sofia protocol on Nitrogen oxide (NO_X)

emissions (UNECE, 1988). The 1988 NO_X Protocol introduced the application of national standards based on Best Available Techniques (BATs).

The 1999 Gothenburg Protocol is a multi-pollutant, effects-based protocol, directed to abate acidification, eutrophication and ground-level ozone (vegetation and human health) (UNECE, 1999). Targets were set for all four environmental problems and cost-effective emission ceilings were calculated on the basis of integrated assessment modelling for each pollutant. Subsequently, these calculated ceilings were negotiated. With a few exceptions, each of the Parties that have ratified the Protocol has so-called basic obligations related to nitrogen, including (i) achieving the set emission ceilings according to the set time-scale, (ii) applying limit values to stationary and mobile sources of emission according to the set time-scale, and (iii) applying, as a minimum, the NH_3 control measures specified in annex IX of the Protocol (Table 4.S1).

The interlinkages between pollutants and effects highlight the importance of understanding the nitrogen cycle as well as the need to coordinate with other institutions that have interests in nitrogen management. The preamble to the Gothenburg Protocol notes "that measures taken to reduce the emissions of nitrogen oxides and ammonia should involve consideration of the full biogeochemical nitrogen cycle and, so far as possible, not increase emissions of reactive nitrogen including nitrous oxide which could aggravate other nitrogen-related problems" (UNECE, 1999).

With a target date for emission limits in the Gothenburg Protocol set for 2010, the Parties to the Convention are currently negotiating a new instrument which is likely to have more stringent controls for the gases covered by the Gothenburg Protocol. They are now even more aware of the synergies and trade-offs between air pollution and greenhouse gas controls. All of the protocols signed under the CLRTAP have been translated into EU Directives (see Section 4.3.3.).

4.S2. UNFCCC Kyoto Protocol

The United Nations Framework Convention on Climate Change (UNFCCC) is the main international agreement addressing the issue of climate change (UNFCCC, 2010). It came into force in 1994. The Kyoto Protocol is an international agreement linked to UNFCC; it was adopted on 11 December 1997 and entered into force on 16 February 2005. UNFCCC requires parties to use the Revised 1996 IPCC (Intergovernmental Panel on Climate Change) Guidelines for National Greenhouse Gas Inventories. Targets have been set for the total emissions of six greenhouse gases, one of which is nitrous oxide (N_2O). Under the Kyoto Protocol, the EU is required to reduce greenhouse gas emissions (specified in "CO_2 equivalents") to 8% below 1990 levels by 2008-2012 (EC, 2002). No specific targets have been set for abating N_2O emissions, and the EU reduction targets may be achieved through other greenhouse gases than N_2O in order to achieve an equivalent CO_2 decrease. Several other European states - Switzerland, Norway, and Croatia - have committed to meet the same target.

4.S3. International Conventions on the protection of the marine area

The main international agreements about the loading of nitrogen into the marine environment are summarized in Table 4.S2. The Helsinki Commission (HELCOM) deals with the environment of the Baltic Sea and aims at decreasing pollutions from surrounding countries (Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden; HELCOM (2010). The HELCOM Baltic Sea Action Plan aims at to restore the good ecological status of the Baltic marine environment by 2021, and addresses especially eutrophication and pollution. Reductions in N and P inputs have so far mainly been achieved through improvements at major point sources, such as sewage treatment plants and industrial wastewater outlets (HELCOM, 2005; 2009).

The aim of the OSPAR Convention is to conserve marine ecosystems and safeguard human health in the North-East Atlantic by (i) preventing and eliminating pollution, (ii) protecting the marine environment from the adverse effects of human activities, and (iii) by contributing to the sustainable use of the seas (OSPAR, 2010a). The Eutrophication Strategy is focused on decreasing N and P inputs (Table 4.S2). Agriculture is seen as the main anthropogenic source for releases of N and P to the environment, and it is believed that a further reduction of nutrient inputs best can be realized through adequate implementation of the EU Water Framework Directive, the EU Nitrates Directive and the EU Urban Waste Water Treatment Directive (see section 4.4.2).

In addition to the OSPAR Convention dealing with the North-East Atlantic, including the North Sea, a series of conferences were held specifically addressing the North Sea (OSPAR, 2010b). The first International North Sea Conference took place in Bremen in 1984 and the sixth and last in Gothenborg in 2006. The Progress Report to the 5th North Sea Conference in Bergen in 2002 provides an overview of the history of the North Sea Conferences and the progress made (CONSSO, 2002). For nitrogen, the main decisions were:

- A 50% reduction of the nutrient supply to the North Sea, both from point sources and non-point sources, and
- Taking efficient measures to decrease nutrient emissions where these emissions are damaging.

The 1976 Barcelona Convention for Protection against Pollution in the Mediterranean Sea aimed to prevent and abate pollution from ships, aircraft and land-based sources in the area of the Mediterranean Sea (UNEP, 2010a). The Barcelona Convention, has established 5 protocols, as well as the Mediterranean Action Plan (UNEP, 2010b), and these form part of the Regional Seas Program of the United Nations Environment Program. There are no quantitative targets and or limit values (Table 4.S2).

Table 4.S2. Overview of International Conventions related to the protection of the marine environment in Europe, and which address directly or indirectly nitrogen loadings (see also EC, 2009).

Convention	Description / objectives	Recommendation/Decision/Targets

Helsinki Convention (HELCOM)	To protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental co-operation between Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.	Ministerial Declaration on the Protection of the Baltic Sea in Helsinki on 15 February 1988 (recalled and strengthened by recent declarations): • A reduction of the load of heavy metals, toxic organic substances and nutrients of 50% not later than in 1995. • Minimize the deposition of air-borne pollutants
OSPAR Convention/ PARCOM + OSCOM;	To conserve marine ecosystems and safeguard human health in the North-East Atlantic by preventing and eliminating pollution. The work is guided and supported by: • The precautionary principle • The polluter pays principle; • Best available techniques (BAT) & best environmental practice (BEP).	PARCOM Recommendation 88/2 to: • take effective national steps in order to reduce nutrient inputs into areas where these inputs are likely, directly or indirectly, to cause pollution; • aim to achieve a substantial reduction (of the order of 50%) in inputs of phosphorus and nitrogen into these areas between 1985 and 1995, or earlier if possible
Barcelona Convention/ Mediterranean Action Plan	• to assess and control marine pollution; • to ensure sustainable management of natural marine and coastal resources; • to protect the marine environment through prevention and reduction/elimination of pollution	Protocol for the protection of the Mediterranean Sea against pollution from Land-Based sources (LBS Protocol), agreed in 1980: • Establishment of Action Plans; • Use of best available techniques and measures; • No quantitative targets and limit values for nitrogen
Bucharest Convention	To prevent, reduce and control the pollution in the Black Sea in order to protect and preserve the marine environment.	Protocol on the protection of the Black Sea against pollution from Land Based sources: • To reduce pollution, including nitrogen (but without specific targets)

The Convention on the protection of the Black Sea against pollution (Bucharest Convention) was signed in 1992 (BSC, 2010). It has three Protocols, of which the 'Protocol on the control of land-based sources of pollution' addresses nutrients and eutrophication.

4.S4. The Convention on Biological Diversity

The 1992 Convention on Biological Diversity (CBD, 2010) has much relevance to nitrogen controls because of the multiple impacts of nitrogen on all forms of biodiversity, although the text of the Convention does not specifically make reference to nitrogen. The Convention has 193 Parties, including EU Member States and most other countries of Europe, e.g. Norway, Switzerland.

In 2002, the Conference of the CBD Parties adopted a Strategic Plan that includes the target of achieving by 2010 a significant reduction of the current rate of biodiversity loss. In 2004, the CBD Conference agreed on a framework to evaluate progress towards the 2010 target, including a set of goals and sub-targets under seven focal areas for action, including measures to address the threats to biodiversity. Under this focal area, target 7.2 aims to reduce pollution and its impacts on biodiversity. Based on preparatory work by an ad hoc expert group on indicators, the Convention's Subsidiary Body on Scientific, Technical and Technological Advice considered documentation on indicators for assessing progress towards the 2010 target, including "Nitrogen deposition" (CBD, 2004). The Conference of the Parties adopted 'Nitrogen deposition' as an indicator that could be immediately tested.

The 2nd edition of Global Biodiversity Outlook (CBD, 2006) addressed also the impacts of excessive reactive nitrogen on terrestrial and aquatic biodiversity, showed the geographic distribution of nitrogen deposition from the atmosphere and discussed the trade-offs between conservation goals and the need to increase food production. The 3rd edition of Global Biodiversity Outlook, due to be launched in May 2010, will assess the achievements of the 2010 biodiversity target, including updated information on nitrogen deposition.

4.S5. Convention on Transboundary Waters and International Lakes

The UNECE Convention on Transboundary Waters and International Lakes ('Water Convention', UNECE, 1992) sets out to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and ground waters. Once again, it is strongly linked to EU legislation, and EU countries play a major role in its implementation. While the Convention text makes numerous references to pollution in general, it makes no specific reference to nitrogen issues (UNECE, 1992). The first assessment report provides an integrated assessment of 140 transboundary rivers and 30 transboundary lakes in the European and Asian parts of the UNECE region (UNECE, 2007).

4.S6. Intergovernmental organizations

Intergovernmental organizations (IGOs), whilst not specifically legislative bodies, influence policy internationally. They are distinguished from treaties by virtue of their "international legal personality". Many treaties do not establish an "organization", but rely on the parties for their administration. Other treaties have established an administrative apparatus, but this is not necessarily an international legal personality.

There are large numbers of IGOs, which differ in function, membership and membership criteria. They have various goals and scopes, often outlined in their treaty or charter. Many IGOs have interests related to the environment and nitrogen management. These may operate at regional or global levels. Some global institutions, such as the United Nations Environment Programme (UNEP), also have regional bodies (Regional Offices)

to meet the different challenges of the different regions of the world. They play an important role in developing international environmental policy.

The United Nations and its five regional Commissions were established in the 1940's to act as global and regional over-arching bodies for the countries of the world. The UN has spawned many agencies and organizations. Those with interests in nitrogen management include the following.

The United Nations Environment Programme (UNEP) was founded as a result of the 1972 UN Conference on the Human Environment. Its mission encompasses all environmental issues and UNEP's work inevitably overlaps with that of many other IGOs, including those with interests in nitrogen. Its work addresses 6 priority environmental challenges (UNEP, 2010c). It is worth noting that, with WMO (see below) it established the IPCC (see below). UNEP also launched the Global Partnership on Nutrient Management (UNEP, 2010d).

The World Health Organization (WHO) is the directing and coordinating authority for health within the UN (WHO, 2010). Its Constitution came into force in 1948 and since that time it has been responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries, and monitoring and assessing health trends. It cooperates with governments and other IGOs to provide expert advice on human health issues (e.g. to CLRTAP and the Water Convention).

The Food and Agriculture Organization (FAO) of the UN was founded in 1945 to lead international efforts to defeat hunger. It aims to acts as a neutral forum where all nations, developed and developing, meet to negotiate agreements and debate policy (FAO, 2010). FAO is also a source of knowledge and information and helps developing countries and countries in transition to modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. Because of the importance of nitrogen for agriculture and forestry, FAO has a considerable interest in nitrogen management.

The World Meteorological Organization (WMO) originated from the International Meteorological Organization, which was founded in 1873. Established in 1950, WMO became the specialized agency of the UN in 1951 for meteorology (weather and climate), operational hydrology and related geophysical sciences (WMO, 2010). WMO works closely with a number of regional and global MEAs and IGOs and was co-founder of the IPCC.

The Intergovernmental Panel on Climate Change (IPCC) was established by UNEP and WMO in 1988 to assess the state of existing knowledge about climate change: its science, the environmental, economic and social impacts and possible response strategies (IPCC, 2010). Its close links to UNFCCC have been described above.

The Arctic Council is an IGO focused on the Arctic region (Arctic Council, 2010). It was established in 1996 by decision of the eight governments of the Arctic region as a high-

level forum for promoting cooperation, coordination and interaction among the arctic States, with the involvement of the arctic indigenous communities and other arctic inhabitants on common arctic issues, in particular issues of sustainable development and environmental protection in the Arctic. The Council's *Arctic Monitoring and Assessment Programme* (AMAP), established as a Working Group, has produced a number of reports that consider the impacts of air pollution on the Arctic (AMAP, 2006); these have been produced in cooperation with EMEP and CLRTAP ensuring a harmonized approach to the analysis of deposition and impacts.

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