HELSINKI COMMISSION
Baltic Marine Environment Protection Commission

Implementing the HELCOM Objective with regard to Hazardous Substances

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Guidance Document on Dioxins

Presented by Finland

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Guidance for policy makers to select and apply appropriate instruments in order to achieve cessation of emission, losses and discharges of certain hazardous substances in the Baltic Sea Area.

CONTENTS

0. BACKGROUND

Hazardous substances are substances or groups of substances that are persistent and liable to bioaccumulate and toxic or other substances or groups of substances, which are agreed by the Helsinki Commission as requiring a similar approach even if they do not meet all the criteria for toxicity, persistence and bioaccumulation, but which also give grounds for concern. These could for example be endocrine disrupters and substances that can damage immune systems.

The HELCOM Objective with regard to Hazardous Substances, as adopted in 1998 within HELCOM Recommendation 19/5, is to prevent pollution of the Convention Area by continuously reducing discharges, emissions and losses of hazardous substances towards the target of their cessation by the year 2020, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.

Based on a list of numerous potential substances of concern, 43 were selected for immediate priority action, among them e.g. mercury and its compounds, cadmium and its compounds, short-chained chlorinated paraffins (SCCP), nonylphenol and nonylphenolethoxylates (NP/NPE), and dioxins (HELCOM Recommendation 19/5, ATTACHMENT, Appendix 3).

A Project Team for the implementation of the HELCOM Objective with regard to Hazardous Substances held its 1st meeting in October 1998 and since then meets twice a year in Helsinki. It consists of members from all Contracting Parties (Denmark, Estonia, European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden) and representatives of NGOs (e.g. CEFIC, EuroChlor, WWF).

The Project Team decided on a pilot programme for a subset of the hazardous substances for immediate priority action to

- identify sources (incl. stockpiles), pathways and fate
- survey the legislative and the market situation
- initiate and promote development of policy instruments and measures aiming at cessation of emissions, losses and discharges, e.g. by substitution and/or minimised use.

The Contracting Parties with the help of a questionnaire submitted available information on the occurrence and regulation of those substances. This information is used to assess the exposure situation and thus to assess the risk. After these assessments relevant measures have to be identified and applied.

The Extraordinary Meeting of the Project Team for the Implementation of the HELCOM Objective with regard to Hazardous Substances, held in May 2001, in Berlin/Germany, decided to prepare guidance documents on certain substances, which should take into account the available information from EU, OSPAR, HELCOM (e.g. 4th PA), CEFIC and EuroChlor. In case no data are available realistic assumptions/estimations of application areas and amount of uses should be made. Risk reduction measures should be identified.

The presented guidance document contains available information on production and use of dioxins, sources of emissions and discharges, possible pathways to the marine environment, and monitoring data. It assesses the extent of the problem caused by dioxins, identifies possible measures to reach reduction and cessation of emissions, discharges and losses and instruments to implement these measures. Finally, proposals for possible HELCOM actions are discussed.

The document aims to provide guidance to policy makers with regard to

- Identification of relevant sources of release
- Prioritisation among sources
- Identification of appropriate measures to cease these releases
- Identification of appropriate policy instruments to implement these measures
- Making the choice among the available instruments and measures aiming to get the best outcome for the efforts taken

1. IDENTIFICATION AND QUANTIFICATION OF SOURCES

1.1 Production and Use

Polyhalogenated dibenzo-p-dioxins and dibenzofurans are tricyclic aromatic halogen ethers, of which the most examined ones are chlorinated compounds, usually called simply dioxins and furans. There are 210 different chlorinated dibenzo-p-dioxin (PCDD) and dibenzofuran (PCDF) compounds, of which 75 are PCDD congeners and 135 PCDF congeners. The best-known and most harmful congener is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD).

Polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans have never intentionally been produced, but they are formed as by-products or impurities in several industrial processes as well as in most combustion processes. There is no use of dioxins and furans either. Average consumers are exposed to dioxins because these compounds occur as contaminants in some products.

In recent years concern has also been shown for other compounds that have similar effects to dioxins. These kinds of substances include at least some polychlorinated biphenyls (PCB). United Nations World Health Organisation WHO has suggested that such PCBs should be included in risk assessments of dioxins.

1.2 Sources of emissions and discharges

There are many chemical or pyrochemical processes that are known to be potential sources for dioxin emissions. There are also natural events or processes that can cause dioxin emissions, for example forest or steppe fires and volcanic eruptions. Many research programmes have improved the knowledge about dioxin air emissions so that there are quite good measurements or estimations available from some countries. However, it seems that the knowledge concerning dioxin concentrations in wastewater or wastes is not on the same level. The estimated emissions, collected in table 1 (chapter 2.2), show the most significant sources in HELCOM countries.

Besides the known present sources there are remaining pollutants from historical emissions and incidents (accidental emissions, fires), which can cause remarkable dioxin or furan fluxes to and within the environment. The fluxes may be estimated to occur via industrial and municipal wastewater and they can reach the Baltic Sea, depending on the hydrological conditions of the fluxes. So it is important to examine and evaluate this kind of historical episodes and their releases and present impacts in each member country.

For some activities, which are generally referred to as point sources of dioxin emissions, emission factors have been elaborated. It seems evident that there is less knowledge concerning the formation of dioxins from non-point sources and natural events. Emission

estimations are often made by using available measured data, which is complemented with calculations and expert assessments.

2. PATHWAYS TO THE MARINE ENVIRONMENT, MONITORING DATA, AND ASSESSMENT OF THE EXTENT OF PROBLEMS

2.1 Pathways to the marine environment

The pathways of dioxins to the Baltic Sea can vary according to the original source. The major route is via the atmosphere but considerable pollution also occurs via the wastewater of the dioxins forming sources or the waste processing. There are some estimations concerning dioxin transportation to the marine environment, although remarkable uncertainties have been reported.

When estimating the pathways of dioxins from their sources to the Baltic Sea, it would be necessary to know the situations at the sources in addition to the total emission rates of the country. For example it could be estimated that only some parts of the dioxin emissions from sources in Russia and Germany reach the Baltic Sea. The degree of transitions of dioxins into the sea can depend at least on the types of the catchment areas and the dominant wind directions.

Soils and sediments are mentioned to be important reservoir sources due to the persistence of these pollutants in the environment. The most important route for human exposure to dioxins is food consumption, contributing for more than 90 % to total human exposure. Products of fish and other products of animal origin account for approximately 80 % of the overall dietary dioxin exposure (Commission of the European Communities 2001 b).

2.2 Monitoring data

The amounts of dioxins and furans are usually reported as “I-TEQ grams”, which means the compiled emission of 17 isomers (congeners) of PCDD and PCDF related to the most toxic isomer 2,3,7,8-TCDD. The relevant isomers are converted using toxicity equivalence factors in order to get one single value called the International Toxic Equivalent (I-TEQ). The factors and isomers taken into account are defined by NATO's Committee on the Challenges of Modern Society (CCMS). WHO has suggested to include some PCB compounds that have effects like dioxin in the risk assessments of dioxins. This approach has resulted in the development of the WHO Toxicity Equivalency Factors.

Comprehensive monitoring data available on dioxin emissions or pollution in waters in the Baltic region is quite limited. One apparent reason is substantial costs related to the monitoring and analyses of different dioxin or furan congeners in air emissions, effluents and environment. There are some more or less regular ongoing reporting procedures linked to the activities of UNECE/LRTAP (Convention on Long-range Transboundary Air Pollution), the EMEP programme under LRTAP, UNEP (organised by UNEP Chemicals) and the European Union (e.g. Commission Decision on EPER register). Some enquiries for harmful chemicals have also been carried out within PARCOM and HELCOM.

In 1996 HELCOM collected data on heavy metals and persistent organic pollutants (POPs) in order to assess the national reports on measures to reduce discharges of these substances. Data on dioxins/furans (on air emissions) were submitted only by Germany and Latvia. Contracting Parties were asked in 1999 to report on changes in the discharges, emissions and

losses of various hazardous substances between the late 1980ies and late 1990ies. The results were reported in the document "The Implementation of the 1988 Ministerial Declaration on the Protection of the Marine Environment of the Baltic Sea Area with regard to Hazardous Substances. A final overall conclusion including the new goals." (HELCOM 2001a). A rough estimation of whether the intended 50 % reduction goal for emissions, discharges and losses of hazardous substances has been reached by the Contracting Parties shows successful reduction for dioxins only for Germany. Pollution load compilations (PLC) made by HELCOM have not included data on the amounts of persistent organic compounds.

In the following tables emission data from different data sources are compiled. Table 1 shows the most important estimated sources in HELCOM countries and table 2 shows total dioxin air emissions in different years. Generally the emission estimates have been made by the countries themselves (for UNECE and UNEP) and by the experts in the same time for different countries using emission factors and available production data (TNO Institute of Environmental Sciences, AEA Technology, Landesumweltamt Nordrhein-Westfalen). Sometimes the estimates differ significantly from each other.

Table 1: Dioxin/furan –emissions to air [%] by type of sources in 1990 in HELCOM countries. (Umweltbundesamt and TNO Institute of Environmental Sciences 1997)

Main branch	Specified sub-branch	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Russia	Sweden
Total [%]		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Stationary combustion (incl. industry)		27.3	93.2	69.8	37.2	82.2	87.4	59.9	63.9	1.2
Production processes				25.3	61.6			28.4	26.9	59.3
	Iron and steel industry			25.3	51.3			28.1	26.6	33.5
	Of that: Sinter plants			23.6	48.2			16.0	24.8	27.2
Road transport					0.8			0.5		
Other mobile sources and machinery		1.8	0.8	1.1		4.8	1.9		2.3	10.8
Waste treatment and disposal		70.8	5.9	3.8	0.3	13.1	10.7	11.4	6.9	28.7
	Waste incineration	70.8	5.9	3.8		13.1	10.7	11.4	6.9	12.0
	Cremation				0.3					
Note: The data from Germany, Poland and Sweden are submitted by the countries. Others are **estimated by TNO**.										

Table 2: Dioxin/furan –emissions from HELCOM countries to air expressed in gram International Toxic Equivalents per year (g I-TEQ/a, see the explanation in the chapter 2.2.).

Country	1990	1991	1992	1993	1994	1995	1993-95¤¤¤¤	1996	1997	1998	1999
Denmark	70,6*				15****	14**** 50 ¤¤	50	21****	20****	19-170¤¤¤	95****
Estonia	17,7*										
Finland	53,3* 30,0**	33,2**	31,2**	31,9**	32,7**	33,8**	68	31,7**	32**	32,1**	32,2**
Germany	1196***					309****	840				
Latvia	13,5*										
Lithuania	23*								5,62****	5,97****	5,03****
Poland	359*, 368****	349****	338****	397****	361****	388****		366****	348****	290****	287****
Russia	1412*, 1020 ¤, 991****	947****	901****	878****	825****	769****		637****	614****	606****	625****
Sweden	83,5* (58-127)****			19-46****			89				

* Umweltbundesamt and TNO (1997)

** Updated information delivered to UNECE/LRTAP in february 2002

*** Umweltbundesamt and TNO (1997) and UNECE/LRTAP. 6,5 % of Germanys area belongs to catchment area of the Baltic Sea

****UNECE/LRTAP (situation from UNECE home pages 7 December 2001. (For Russia EMEP area / European part)

¤ Estimated share of emissions from the European part; Bulgakov et al (1998).

¤¤ Jensen A-A (1997)

¤¤¤ Hansen E. (2000) (For UNECE/LRTAP reported 20 g)

¤¤¤¤ The European Dioxin Emission Inventory Stage II, Volume 3 / Landesumweltamt Nordhein-Westfalen (1997)

There are only a few published estimations of dioxin emissions to land. The estimations presented in the report “Releases of Dioxins and Furans to Land and Water in Europe”, (AEA Technology Environment in 1999, authors: Wenborn M. et al.) are presented in table 3. The report is available at **http://europa.eu.int/comm/environment/dioxin/index.htm)**. We quote chapter "*4.3. Uncertainty*" of the report: “*There are very limited quantities of data available relating to PCDD/F releases to land and water and the estimates in this inventory are therefore very uncertain*” and ”*There is a particular lack of information on releases to water and, therefore, few quantitative estimates have been made for this medium. However, this inventory of releases of PCDD/F to land and water, together with the inventory of releases of PCDD/F to air (Umweltbundesamt and TNO Institute 1997), is the first integrated inventory for releases of any POP in Europe. It represents a good starting point for improvement of the inventory and ultimately for appropriate development of future policy to further reduce or control releases of PCDD/Fs into the environment*.” The report focuses on the inventory and no risk analysis concerning human health or environment has been made.

Table 3: Summary of ‘best estimates’ of releases of PCDD/F to land in 1994.
(AEA Technology Environment 1999)

Country	g I-TEQ/a
Denmark	450
Estonia	Not estimated
Finland	370
Germany	5700
Latvia	Not estimated
Lithuania	Not estimated
Poland	Not estimated
Russia	Not estimated
Sweden	660

Concerning specially dioxin releases to water the above mentioned report by AEA Technology states: “*There are far less data available to enable releases to water to be estimated and for most sources an indication of whether the source is likely to release a high, medium or low emission to water has been given, rather than an estimate of the release quantified*.” As possible important dioxin sources pesticide production, chemical production, accidental fires, disposal of municipal solid waste (MSW) to landfill and pesticide use are mentioned. The only emission figure for what is called “high potential sources” is from one PVC process, the estimated release being 0,15-50 g I-TEQ. Releases from such sources are estimated to be decreasing after 1994, except for accidental fires and disposal of MSW to landfill. It is evident that at least landfills are still important possible dioxin sources to waters and possibly also to the Baltic Sea. Concerning the total dioxin emissions to the water, the AEA Technology report states that “While not quantified, total releases to water are likely to be significantly less than both releases to land and to air. This is because wastewater treatment is likely to concentrate the PCDD/Fs in sludge. However, the extent of waste water treatment is likely to vary between sectors and between countries.” Accordingly the releases to water would have mainly local effects and increasing levels are caused via other emission routes.

The Russian delegation has forwarded a communication referring to a report called "The Environmental situation in Russian Federation". According to this report the dioxin content in the snow cover during 1993-1997 was in the Karelia region 4,3 ng TEQ/kg (minimum 0,6) and in the Leningrad region 8,0 ng TEQ/kg (minimum 1,6). In the same report the concentrations in soils

were in Karelia 5,9 ng TEQ/kg (minimum 0,5), in Leningrad region 5,0 ng TEQ/kg (minimum 1,7) and in Kaliningrad region 1,5 ng TEQ/kg (minimum 0,7.

According to studies made in the Baltic area, dioxin concentrations in sediments and biota in some affected areas have been higher than in other parts of the region. Generally speaking no area is unaffected because of air borne dioxin/furan emissions but the most affected areas are in the vicinity of some point sources (e.g. pulp and paper mills or chemical plants like vinyl chloride or biocide manufacturing). Some areas are still polluted by old emissions, which have already decreased or stopped several years ago. Moreover, some decreases of the environmental concentrations of dioxins have been reported since the 1970s, although the rate of decrease possibly has slowed down lately or reached a steady state at some level. Anyhow, concentrations in herrings from the Baltic Sea have remained so high that Finland and Sweden have got exemptions for domestic marketing of fish from the Baltic Sea from the general threshold values recently agreed upon in the European Union (see chapter 3.1.2 concerning the EU strategy). The Nordic Council of Ministers recommended in 1988 a tolerable weekly intake (TWI) of 35 TEQ pg/kg body weight.

Documented concentrations in sediments, far from the coast, have generally varied between 25-68 ng I-TEQ/kg, although values up to over one thousand ng I-TEQ/kg have been reported for sediments near the coast and known sources of pollution. No really extensive researches on sediment concentrations during the years have been found. Some studies concerning PCBs refer to a positive development in dioxin and furan concentrations (decreasing values). The dioxin concentrations in birds' eggs, in the central Baltic Proper, have been decreasing from the seventies up to the nineties.

2.3 Assessment of the extent of problems

The problems caused to people by dioxin/furan emissions are linked to the possibilities for exposure to the substances, for example through dietary intake. The biota may be affected even more constantly. Some animals, e.g. seals, have been shown to be able to metabolise dioxins. Generally dioxins and furans are recognised to be very harmful to people and the whole biota.

According to the background material used by the EU Scientific Committee on Food, the dioxin intake of people varies in EU countries. For example the share of fish and fish products in Finland is about 60 % while the corresponding figure in Germany is only approximately 10 %. The differences can, naturally, depend both on the overall diet composition and on the dioxin concentrations. It is well known that the levels of dioxin in Baltic herring, and especially in older fish can be quite high. An overall assessment of the dietary risks would be useful in all countries around the Baltic Sea.

There seems to be a need for comprehensive risk assessments in the Baltic Sea area concerning the harms caused by dioxins and furans. One of the biggest problems is still the lack of extensive knowledge concerning emissions to different media (air, waters, waste) and concentrations in the environment.

3. IDENTIFICATION OF POSSIBLE MEASURES AND INSTRUMENTS

3.1 Measures required by EU legislation or international agreements

The problems of dioxins and required measures to solve them have been discussed in different fora of the international environmental co-operation (EU, PARCOM, United Nations organisations, OECD).

3.1.1 The legislation and obligatory measures

There are many obligations concerning polychlorinated dibenzodioxins and dibenzofurans in international agreements and the EU legislation. The following EU directives and international agreements concern dioxins specifically, or as part of more general commitments on hazardous chemicals or emissions.

EU Directives

- 89/369/EEC on the prevention of air pollution from new municipal waste incineration plants.
- 89/429/EEC on the reduction of air pollution from existing municipal waste-incineration plants.
- 94/67/EC on the incineration of hazardous waste. The directive contains a threshold concentration for dioxins in waste gases (0,1 ng/m3).
- 2000/76/EC on the incineration of waste. The directive contains emission limits for emissions to air and water. The previously mentioned directives will be replaced by 2000/76/EC on 28 December 2005.
- Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control. The permit for the installations specified in the directive shall include emission limit values for pollutants, in particular those listed in Annex III (e.g. dioxins and furans).
- Commission Decision 2000/479/EC of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC. One of the pollutants/substances to be reported is dioxins and furans (PCDD + PCDF).
- Directive 2000/60/EC establishing a framework for Community action in the field of water policy. The directive does not lay down direct obligations concerning dioxins.
- Council Directive 96/82/EC of 9 December 1996 on the control of major accident hazards involving dangerous substances.
- Draft Directive on Large Combustion Plants (LCP) (PE-CONS 3640/01) doesn't include obligations for dioxin/furan emissions. The directive does not concern the plants that use wastes as fuel. The plants using treated waste wood that may contain halogenated organic compounds or heavy metals, are covered by the directive on the incineration of waste. However LCPs are potential dioxin sources and obligations for particulate emissions may have beneficial effect on the dioxin emissions of LCPs.

Oslo and Paris Commission (OSPAR/PARCOM) decisions and recommendations

- PARCOM Recommendation 91/3 on measures to be taken and investigations to be carried out in order to reduce pollution from secondary iron and steel production. Actions needed: The situation regarding e.g. dioxin emissions to be presented.

– OSPAR Decision 98/4 on Emission and Discharge Limit Values for the Manufacture of Vinyl Chloride Monomer (VCM) including the Manufacture of 1,2-dichloroethane (EDC). The decision contains emission limits for emissions to the air and for effluents.

UNECE

The UNECE POPs Protocol to the Convention on Long-Range Transboundary Air Pollution, signed by the EU in Aarhus in June 1998 obliges the Parties to reduce their emissions of dioxins, furans, PAHs and HCB below their levels in 1990 (or an alternative year between 1985 and 1995). For the incineration of municipal, hazardous and medical waste, it lays down specific limit values.

The Convention of the Protection and Use of Transboundary Watercourses and International Lakes (signed in 1992) is intended to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and groundwater. According to the convention the parties shall take all appropriate measures to prevent, control and reduce any transboundary impact. For this aim they shall develop, adopt, implement and, as far as possible, render compatible relevant legal, administrative, economic, financial and technical measures. One detailed measure is to ensure that limits for wastewater discharges stated in permits are based on the best available technology (BAT) for discharges of hazardous substances.

HELCOM

– Recommendation 16/8, Limitation of emissions into atmosphere and discharges into water from incineration of household waste. The Recommendation contains limits for atmospheric emissions.
– Recommendation 13/4, Atmospheric pollution related to the use of scrap materials in the iron and steel industry. The Recommendation doesn't contain limits for emissions, but calls for measures e.g. to reduce chlorinated substances in scrap and the emissions to be reported.
– Recommendation 6/1 regarding the elimination of the use of PCBs and PCTs. The Recommendation affects indirectly dioxin emissions.
– Recommendation 19/5 with regard to hazardous substances.
– Persistent, toxic or bioaccumulative substances are addressed, in general, in Recommendations 9/8, 11/7, 13/2, 13/4, 14/3, 17/5.

UNEP

Stockholm Convention on persistent organic pollutants (May 2001) seeks, *inter alia*, measures to reduce or eliminate releases from unintentional production. Dioxins, furans and PCBs belong to these releases. Among the measures is development of national, regional or subregional action plans designed to identify, characterize and address the releases of the listed chemicals and to facilitate, *inter alia*, implementation of measures for achieving release reduction or source elimination. Further the parties shall develop plans for implementation of their obligation under the Convention.

3.1.2 Programmes and strategies

EUROPEAN UNION (EU)

The Commission of the European Communities has in October 2001 prepared a strategy called "Community Strategy for Dioxins, Furans and Polychlorinated Biphenyls". The objectives of the strategy are:

- to assess the current state of the environment and the ecosystem
- to reduce human exposure to dioxins and PCBs in the short-term and to maintain human exposure at safe levels in the medium to long term;
- to reduce environmental effects from dioxins and PCBs.

The quantitative objective is to reduce human intake levels below 14 picograms WHO-TEQ per kg bodyweight per week. The Scientific Committee on Food (SCF) established this level in May 2001 in its opinion on the risk assessment of dioxins and dioxin-like PCBs in food.

The proposed strategy of EU states "a set of actions has to be identified for the short- to medium-term and for the long-term". In this way it is possible "to reduce the sources of environmental contamination with these compounds to the lowest possible as the most appropriate way to reduce human exposure". To the short- to medium-term actions (5 years) belong actions divided under the titles "Hazard identification", "Risk assessment", "Risk management", "Research", "Communication to the public" and "Co-operation with third countries and international organisations". Long-term actions (10 years) are grouped under the titles "Data collection on the level of dioxin/PCB contamination in air, water (sediment) and soil", "Monitoring and surveillance of the level of dioxin/PCB contamination in air, water (sediment) and soil" and "Identification of measures". To "Risk management" belong "prevention measures" (e.g. actions preventing the formation and release of dioxins and PCB), "control of emissions" and "control of the quality of the environment".

The proposed strategy states under the subtitle "Co-operation with third countries and international organisations" that "co-operation with WHO is essential to avoid duplication of work and will continue in the future", and goes on: "as a contracting party to several conventions in the field of dioxins and PCBs the Commission will continue international co-operation on this subject". The strategy states that "emissions in the accession countries are likely to be higher than in the EU", so "the Commission intends to launch a project in order to identify important dioxin sources and to carry out measurements in the accession countries".

On 13 December 2001 The Council of the European Union has given the conclusions concerning the communication of the Commission (the proposed strategy). The Council supports the initiative of the Commission. The Council requests, among other things, coherent ratification of international conventions by the European Community and its Member States and the development of implementation instruments for these international commitments. Further the Council requests the Commission to propose Community-wide emission limit values in accordance with the IPPC directive whenever a need for limits is identified.

OSPAR

In the OSPAR Strategy with regard to Hazardous Substances dioxins, furans and PCBs are included in the list of Chemicals for Priority Action. According to the strategy:
"With regard to hazardous substances identified by the Commission for action, such action should include:

a) identifying the sources of hazardous substances and their pathways to the marine environment, using, *inter alia*, information derived from monitoring, research, specific surveys and assessment activities;
b) establishing with the help of an appropriate combination of monitoring, modelling, risk characterisation and risk assessment techniques, whether these sources represent either a widespread problem or a problem restricted to regional or local environments within the maritime area; and, as a result,
c) the identification of relevant measures to deal with the problem, including the adoption of measures to reduce discharges, emissions and losses of hazardous substances and taking into account the sources and pathways of hazardous substances."

UNEP

The second session of the Intergovernmental Negotiating Committee for an International Legally Binding Instrument on POPs requested the Secretariat (of UNEP) to gather and synthesise national inventory information. The report, named "Dioxin and furan inventories. National and regional emissions of PCDD/PCDF", summarizes the information on releases of PCDD/PCDF from different sources available and help countries to establish their own dioxin inventories as asked in the decisions adopted by UNEP's Governing Council.

NORDIC COUNCIL OF MINISTERS

The Nordic Council of Ministers has in its work emphasised support to the development to control chemicals in the Nordic region and its so-called "adjacent areas". The declared "general objectives" are that "the use of chemicals must not entail any risk of negative impacts on human health and the environment, and discharges of chemicals constituting a threat to human health and the environment must be discontinued within one generation (25 years)". The Council has also supported the researches on POP concentrations in biota (including dioxins). The Nordic Council of Ministers recommended in 1988 a tolerable weekly intake (TWI) of 35 TEQ pg/kg body weight (Nordic Council 2001, 1996 and 1988).

In many HELCOM countries there are individual environment protection programmes, which can deal directly with hazardous substances or help indirectly via more general environmental actions to lessen the problems of hazardous chemicals.

3.2 Other or new measures and instruments

There is some co-operation concerning dioxin problems just going on in international fora, for example organised by UNEP (connected to Stockholm Convention on POPs). According to a generally accepted opinion among many scientists specific measures should be planned according to the situation in each country. Very often the reductions of emissions from the point sources have been remarkable (concerning e.g. waste incineration) and the problem now is fugitive emissions. To decrease those emissions more research should be made and actions needed should be decided upon according to the results.

4. PROPOSALS FOR POSSIBLE HELCOM ACTIONS

4.1 Evaluation of the need for actions at HELCOM level

The problem of dioxin and furans is topical in EU and also in other fora. As the problem concerns measures particularly for the Baltic region actions decided by HELCOM are without doubt beneficial. As long as EU measures do not apply to all of the countries of the Baltic region, it is useful to have specific actions in the area. Actions should, if possible, be compatible with EU actions.

The most urgent need seems to be filling knowledge gaps concerning emissions and concentrations in the environment including biota. As mentioned before, the EU Commissions has plans to start programmes to identify important dioxin sources and to carry out measurements in the accession countries. The same kind of project is just going on initiated by Denmark with a goal to carry out a survey of dioxin in the Central and Eastern European Countries (CEE) in the Baltic region (Poland, Estonia, Latvia, Lithuania and Russia). That project will probably generate new emission data, which can also be used by HELCOM.

4.2 Proposals for such HELCOM actions

One evident conclusion is that more data on dioxin emissions and concentrations in the Baltic region is needed. If new investigations show remarkable sources (point or diffuse), administrative or informative actions should be focused on them. The air emission estimations for the countries, made by TNO, indicate for example that small residential combustion is an important source of dioxins. Although there were no emissions estimated for landfilling it is worth studying if there are such fires or substances in landfills that can result in substantial dioxin emissions. Furthermore there is little if any comprehensive knowledge at all of possible dioxin fluxes in discharged or drainage waters. The knowledge on the dioxin amounts in wastes and previously polluted areas is not comprehensive either.

The following principles would be useful, when HELCOM Recommendations or other actions are planned:

- The Community Strategy for Dioxins, Furans and Polychlorinated Biphenyls prepared by the European Commission is a good basis for further research and measures, in HELCOM co-operation, to reduce dioxin formation, emission and exposure.
- The actions within HELCOM should be co-ordinated with measures taken by other international parties or fora (PARCOM, OECD, UNEP, and UNECE).

Detailed proposals:

- The knowledge concerning dioxin/furan sources, emissions and concentrations in the environment has to be improved. Especially country specific information about potential point sources of halogenated hydrocarbons should be searched for in co-operation.
- Activities related to local and regional risk assessments and risk reduction measures should be planned, drafted and possibly even to some extent decided without unnecessary delay. The HELCOM strategy for risk management and preliminary decisions on Recommendations for risk reduction measures may be specified later when the improved (and country specific) research data is made available.
- Measures aiming at a broad reduction of emissions of halogenated hydrocarbons from waste treatment and from combustion processes in industry should be promoted by HELCOM using its available means.
- The measures necessitated by EU legislation and obligations or recommendations, probably to be set as follow-up actions according to the Community Strategy for Dioxins, Furans and

PCBs, should be taken into account when formulating HELCOM Recommendations concerning the legislation or practice in EU applicant countries as soon as possible. Russia should be recommended to apply the same standards and strategies for risk reduction.

- Other new international conventions of relevance to dioxins and furans (UNECE POP, UNEP POP) should be ratified by the HELCOM countries without delay.
- Pollution load compilations (PLC), by HELCOM, should in future include data on the amounts of persistent organic compounds including dioxins and furans.

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6. ABBREVIATIONS

a	annum (year)
CEEC	Central and Eastern European Countries
CEFIC	European Chemical Industry Council
CPs	Contracting Parties
EC	European Community
e.g.	exempli gratia / for example
EMEP	European Monitoring and Evaluation Programme
EPER	European Pollutant Emission Register
EU	European Union
EuroChlor	European Chlor-Alkali Industry
g	gram
HELCOM	Helsinki Commission (Baltic Marine Environment Protection Commission)
IPPC	Integrated Pollution Prevention and Control
I-TEQ	International Toxic Equivalent
kg	Kilogram
MSW	municipal solid waste
ng	Nanogram
NP/NPE	Nonylphenol/Nonylphenolethoxylates
OECD	Organisation for Economic Cooperation and Development
OSPAR	Oslo and Paris Commissions
PARCOM	Paris Commission
PCB	Polychlorinated Biphenyls
PCDD	Polychlorinated dibenzo-p-dioxins
PCDF	Polychlorinated dibenzofurans
pg	Pikogram
PLC	Pollution Load Compilation
POP	Persistent Organic Pollutants
PVC	Polyvinyl Chloride
SCCP	Short Chained Chlorinated Paraffins
TCDD	tetrachlorodioxin
TWI	tolerable weekly intake
UBA	Umweltbundesamt (German Federal Environmental Agency)
UN/ECE	United Nations Economic Commission for Europe
UNECE/LRTAP	Convention on Long-range Transboundary Air Pollution
UNEP	United Nations Environment Programme
WHO	World Health Organisation
WWF	World Wide Fund for Nature