HELSINKI COMMISSION
Baltic Marine Environment Protection Commission

Implementing the HELCOM Objective with regard to Hazardous Substances

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"Implementation of the HELCOM Objective with regard to Hazardous Substances" – Project funded by European Communities (Subv 99/79391), Sweden and HELCOM.

Guidance Document on
Short Chained Chlorinated Paraffins (SCCP)

Presented by Sweden

June 2002

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.

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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 short chained chlorinated paraffins, sources of emissions and discharges, possible pathways to the marine environment, and monitoring data. It assesses the extent of the problem caused by short-chained chlorinated paraffins, 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

Production and use of SCCP has declined in all countries being member of EU, mainly due to voluntary agreements of industry. However, data for countries not (or not yet) being members of EU are scarce.

1.1.1 Contracting Parties

Information on production and use of nonylphenol and nonylphenolethoxylates has been provided by the Contracting Parties to the Helsinki Convention and compiled in a report "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 conclusion including the new goals. (May 2001)". Further details are listed in table I in the Annex.

Denmark: The emission, discharges and losses of SCCP are reduced due to a voluntary agreement with the Danish EPA and the PVC-industry in 1991. Discharging licenses have to be granted. Another source of reduction are the main metal processing industries. The consumption of SCCPs in the early 90ies was approx. 75 t/y, in the late 90ies approx. 23 t/y (20 t lubricants and cutting fluids; 3 t other application areas). Thus the consumption was reduced by 69 %. Denmark will amend her national legislation according to a new EU Directive on chlorinated paraffins.

Estonia: Lacking information on production-, sales- or consumption volumes since SCCPs are not regulated in Estonian law.

Finland: The used amounts of SCCP decreased about 97 % between 1988 (840 t) and 1997 (27 t) due to breakdown of uses in paper-, paint-, metal-, textile- and rubber industries.

Germany: The production of SCCPs was stopped by the end of 1995. Substitution of chlorinated paraffins started already in the mid-eighties. The triggering motives were e.g. global policy issues of pro-active companies, disposal costs, and demands for general optimism of plants and processes and direct or indirect pressure due to various regulatory instruments. In 1985, 95 % and in 1999, 99 % of metal working fluids were chlorine free.

Latvia: Lacking information on production-, sales- or consumption volumes.

Lithuania: Lacking information on production-, sales- or consumption volumes.

Poland: SCCPs are not regulated within Polish law and not monitored. They are not produced in Poland. However, possible uses are unknown.

Russia: Lacking information on production-, sales- or consumption volumes.

Sweden: The total use of SCCPs has been reduced by 90 % between 1990 and 1998, mainly due to a serious reduction within the use in metal working fluids and paints. The goal of a total phase-out in chemical products was met in the year 2001 mainly through voluntary phase-out activities by importers, producers and users of chemical products.

1.1.2 EU

According to the EU risk assessment, $C_{10\text{-}13}$ chloroalkanes were manufactured by two producers within the EU, and with a total production of $\leq$ 15 000 tonnes/year (1994). The main uses were in metal working fluids, as plasticiser in paints, coatings and sealants, as flame retardant in rubbers and textiles, and in leather processing (fat liquoring). Recent data show that the corresponding use of SCCP has been reduced from 13 000 tonnes in 1994 to 4 000 tonnes in 1998 (Chlorinated Paraffins Sector Group of CEFIC, 1999; table 1 below). The main use 1998 is still in metal working fluids, in spite of a considerable reduction of 7,362 tonnes. Overall there has been a reduction by nearly 70 % over the period 1994 to 1998, highly due to voluntarily agreements by industry. The unspecified group "other" is increasing considerable from 100 tonnes in 1994 to 648 tonnes in 1998. However, this category may have been used to categorise tonnage where manufacturers are not sure of the exact uses further down the supply chain, and/or to render an account for some earlier not known uses. Therefore, an increase in other uses does not necessarily mean that these are different from those already identified. It could also be a difference in the basis for reporting between 1994 and 1998. On the other hand, it is not possible to rule out new product developments using SCCPs. In 1998, about 50 % of European sales and about 10 % of each Medium Chain Chlorinated Paraffins (MCCP) and Long Chain Chlorinated Paraffins (LCCP) sales have been used for formulation of metal working fluids (Chlorinated Paraffins Sector Group of CEFIC, 1999).

Table 1: Use of SCCPs Europe (EuroChlor, 1999)

Application	tonnes/year in 1994		tonnes/year in 1998	
Metal working fluids	9 380	(71.02 %)	2 018	(49.5 %)
Paints, coatings and sealants	1 150	(8.71 %)	726	(17.8 %)
	695	(5.26 %)		
Rubber/flame retardants/	1 310	(9.91 %)	638	(15.7 %)
Leather fat liquors	390	(2.95 %)	45	(1.1 %)
Textile/polymers (other than PVC)	183	(1.4 %)		
PVC Plasticisers	-		-	
Other	100	(0.75 %)	648	(15.9 %)
Total	**13 208**		**4 075**	

It has not, within the scope of this document, been possible to obtain information on the amount of SCCP imported into the European Community. Hence, it has not been possible to estimate use categories for imported SCCP. Neither has it been possible to get any figures on the amounts of SCCP entering the EU through imported goods. According to a recent report (1999), the total production of SCCP, MCCP and LCCP in China 1997 was about 100 000 tonnes. Even if only a very small fraction reaches EU, e.g. through imported goods, it can be significant amounts.

1.1.3 Swedish Product Register

No further details were revealed from the extended analysis of the Swedish Product Register.

1.2 Sources of emissions and discharges

According to the Overall HARP-HAZ guidance Document (2001) major important sources and sub-sources of discharges to water of SCCPs in IPPC-related industries are to be found in relation to manufacture of basic metals and fabricated metal products (metal industry). Medium important sources and sub-sources include characteristic processes in the manufacture of chemicals, chemical products and man made fibres (production of SCCP), in leather finishing, and in municipal waste treatment (incl. storm water runoff and sludge). Medium important sources also include contaminated sediments. Minor discharges to water relate to manufacture of textiles and textile products. Concerning emissions to air, leather finishing represents a medium important source, while paint application, manufacture of basic metals and fabricated metal products (metal industry), and rubber and plastic products are considered minor important sources for emissions to air.

1.2.1 Contracting Parties

Information on sources of emissions and discharges of SCCPs has been provided by the Contracting Parties to the Helsinki Convention. This information is compiled in table I in the Annex.

1.2.2 EU

The main sources, identified in the EU risk assessment as having the potential for releases to water, sediment and sewage sludge are production sites for SCCP, production sites for the formulation of metal working fluids and leather finishing agents, as well as metal working and leather finishing plants. Metal working plants are also sources for releases to landfills, like leather finishing plants are to air. Rubber working plants are emitting to water, air and soil. Of these, the use of metal working fluids still is by far the largest source of releases into the environment. As considered in PARCOM Decision 95/1, also different products, e.g. articles, containing SCCP are potential sources of emissions. This can be the case during production and use, and when the articles become waste and are sent to landfill. SCCPs could be a possible source of PCBs (polychlorinated biphenyls) and PCNs (polychlorinated naphthalenes) formation via incineration of wastes (CSTEE 1998). In the EU risk assessment, emissions from articles are discussed very briefly. Elaborated methods to estimate this are lacking in the Technical Guidance Document. However, reported data on emissions from surfaces with a paint containing SCCP could indicate that such emissions can be significant (CSTEE 1998).

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

2.1 Pathways to the marine environment

If SCCP reach the marine environment, they will generally do so via rivers and via the atmosphere, from the main compartments to which releases occur. The later are sediment and surface waters in rivers, lakes and seas, air, and soil spread with sewage sludge. Further, recent reports of high levels of SCCP in biological samples from the Arctic could indicate that these chemicals are effectively transported over long distances.

2.2 Monitoring data

Short-chained chlorinated paraffins are not in HELCOM's regular monitoring programmes. Thus, no such data are available for these substances with regard to the Baltic marine environment. The following subchapters (2.2.1-2.2.11) summarize monitoring data from the EU Risk Assessment Report (1999) and from Organohalogen Compounds, Volume 47 (2000).

2.2.1 Surface water

Levels around 0.12-1.45 µg/l have been measured in surface water in rivers from industrial areas in the United Kingdom in year 1986. Levels around 0.50-1.2 µg/l and 0.05-0.12 µg/l have been measured in two rivers in Germany in the years 1987 and 1994, respectively. These values include sites downstream from a chlorinated paraffins production plant. An estimation of SCCPs in waters in non-industrial areas compared to marine waters and industrial areas in the United Kingdom were 0.1-0.3, 0.1-1 and 0.1-2 µg/l, respectively. These data were estimated from analytical values for all chlorinated paraffins in the range C_{10}-C_{20} (data published in year 1980).

2.2.2 Seawater

No information available.

2.2.3 Groundwater

No information available.

2.2.4 Suspended matter

No information available.

2.2.5 Sediment

Levels around 17-83 µg/kg dry weight in sediments have been analysed in rivers in Germany in 1994. These values also include sites downstream from a chlorinated paraffins production plant. Levels around 18-275 µg/kg dry weight in surface sediments have been measured in three lakes in Canada. Levels around 0.0073-0.29 µg/g in surface sediment have been measured in harbour areas along Lake Ontario. Mean levels around 1.8 µg/g were measured in sediment of the Detroit River at Lake Eire in Canada. Levels of around 0.0045 µg/g dry weight have been measured in sediment in Lake Hazen on Ellesmere Island in the Arctic.

2.2.6 Air

No information available

2.2.7 Municipal wastewater treatment plants

Levels around 0.06-0.448 µg/l have been measured in final effluent from sewage treatment plants in southern Ontario in Canada in 1998. Levels of around 0.5-48 µg/g dry matter of chlorinated paraffins (C_{10}-C_{30}) have been measured in household waste collected from Uppsala municipality in Sweden in year 1995.

2.2.8 Industrial wastewater treatment plants

No information available

2.2.9 Sewage sludge

Levels around 47-65 µg/g in sewage sludge have been analysed near a metal working plant in Germany. Further levels around 0.12 µg/l in the run-off water from the sewage plant into a nearby river, and around 0.08 and 0.07 µg/l in the river water, up and downstream from the metal working plant in the years 1991 to 1993.

2.2.10 Concentrations in biota

a) SCCP in biota
Mussels were collected up and downstream from a chlorinated paraffin manufacturing site in the United States. Measured levels of SCCP had a range between 7-280 µg/kg. High levels of SCCP have been measured in different marine mammals in the Arctic, such as seal from Island and walrus from Western Greenland. The measured concentrations of SCCP were 526 and 426 µg/kg in blubber, respectively. Levels of SCCP of around 370-1400 µg/kg have been measured in beluga blubber from St. Lawrence River in Canada. Mean levels of SCCPs of 630 µg/kg, 200 µg/kg, 320 µg/kg and 460 µg/kg have been measured in blubber from male beluga collected in different Arctic places; Hendrickson Island, Arivat (Western Hudson Bay), Sanikiluaq (Belcher Island area in southern Hudson Bay) and in Pangnirtung (south eastern Baffin Island), respectively.

b) chlorinated paraffins in biota
On a lipid basis, levels of around 1,500 µg/kg chlorinated paraffins (C_6-C_{16}) have been measured in herring (muscle), in Bothnian Sea, in the Baltic and in Skagerack in Sweden in the years 1986 and 1987. High concentrations of chlorinated paraffins (C_6-C_{16}) have also been measured in rabbit and moose in Sweden in year 1986, 2,900 and 4,400 µg/kg, respectively on a lipid basis. On a lipid basis, levels of around 130 and 280 µg/kg chlorinated paraffins (C_6-C_{16}), respectively, have been measured in ringed seal blubber from Kongsfjorden, Svalbard in the year 1981 and in grey seal blubber from the Baltic Sea during 1979-85. On a lipid basis, levels of chlorinated paraffins (C_6-C_{16}) of around 1000 µg/kg and 570 µg/kg, respectively, have been measured in whitefish muscle in Lake Storvindeln, Lapland, in Sweden and in arctic char muscle in Lake Vättern, central Sweden in the years 1986 and 1987. On a lipid basis, levels of chlorinated paraffins (C_6-C_{16}) of around 140 µg/kg and 530 µg/kg, respectively, have been measured in reindeer suet and in osprey muscle in Sweden in the year 1986. Levels of chlorinated paraffins (C_{10}-C_{20}) up to 200 µg/kg in fish, 100-12,000 µg/kg in mussels, levels in mussels above 200 µg/kg have been measured in the Wyre estuary close to a paraffin production site, 50-2,000 µg/kg have been found in seabirds (eggs), 100-1,200 µg/kg in heron and guillemot, 200-900 µg/kg in herring gull, 50-200 µg/kg in sheep close to a chlorinated paraffin production plant and 40-100 µg/kg in grey seal have been found in the United Kingdom (data published in year 1980). All these values were estimated from analytical values for all chlorinated paraffins in the range C_{10}-C_{20}.

Stern et. al. (1998) noted that the Arctic formula group profiles showed higher proportions of the lower chlorinated congeners (C_{l5}-C_{l7}), suggesting that the major source of contamination to the Arctic is via long-range atmospheric transport. In St. Lawrence beluga, the formula group profile more closely resembles that of PCA-60, which implies local sources of PCAs.

2.2.11 Human beings

On a lipid basis, mean levels of 13 µg/kg of SCCP were measured in human breast milk from Inuit women living in communities on Hudson Strait in Northern Quebec.

2.3 Assessment of the extent of problems

In the EU risk assessment (EU RAR), it was found that some major characteristics of SCCP are relevant for the assessment of exposure to the environment: the SCCP are not hydrolysed in water; are not readily or inherently biodegradable; have a high log K_{OW} value (4.4-8) and have an estimated atmospheric half-life of 1.9-7.2 days. The high log K_{OW} values indicate a high potential for bioaccumulation, strong sorption to sludge and sediments and very low mobility in soil. High bioconcentration factors (ranging from 1000 to 50 000 for whole body, with high values for individual tissues) have been reported with a variety of freshwater and marine organisms.

Short chain length chlorinated paraffins have been raised as a concern with regard to long-range transport. This is currently being discussed within the appropriate international fora (EU RAR). High levels of SCCP in biological samples from the Arctic could indicate that these chemicals are effectively transported over long distances (CSTEE 1998)

Tumours of the liver, thyroid and kidney (male rats only) were observed in a lifetime carcinogenic study in rats carried out by the US National Toxicology Program (Organohalogen Compounds, Volume 47, 2000).

It can be concluded that all environmental contamination of SCCP is likely to represent a widespread problem. This is due to the persistent, bioaccumulative and toxic (PBT), as well as carcinogenic properties of SCCP. It can further be concluded that emissions from different, also diffuse sources, have the potential to reach the maritime area. On the basis of the accessibility of data on the amount of emissions, discharges and losses from several sources, it is not always possible to fully estimate the degree of risk to the marine environment. However, the absence of data to quantify emissions from each source should not be a hinder to observe potent risks. Hence, the absence of quantifiable data does not eliminate a risk as such.

3. IDENTIFICATION OF POSSIBLE MEASURES AND INSTRUMENTS

3.1 Measures required by EU legislation or international agreements

The SCCP are according to a recent decision (in 25th Adaptation to Technical Progress of EU Directive 67/548/EEC on the classification, packaging and labelling of dangerous substances.) classified as Dangerous for the Environment, with the symbol N and the risk phrases R50/53 (Very toxic to aquatic organisms/May cause long-term adverse effects in the aquatic environment) and Harmful, Carcinogen, cat. 3 with the symbol Xn and risk phrase R40 (Possible risk of irreversible effects).

The agreed conclusions of a final risk assessment and a risk reduction strategy within the framework of the EU Existing Substances Regulation (EEC) 793/93 were unanimously adopted by Member States and the Commission in July 1999.

The EU Commission Recommendation on a risk reduction strategy for SCCP was that limitations on marketing and use within the framework of Council Directive 76/769/EEC for the use and formulation of products, in particular for metal working and leather finishing, should be considered to protect the environment. It was further concluded that these measures would reduce concern for human exposure.

In July 1999 the Directorate General (DG) Enterprise in the EU Commission presented a draft proposal on limitations on marketing and use on metal working fluids and leather finishing uses of SCCP. Member states were divided in the light of the PARCOM Decision 95/1. A further draft, embracing the opportunity to take an immediate decision on a ban on the use and formulation of products for metal working and leather finishing, which in a few years could embrace products, was adopted by the Commission and presented to the Council. In that draft, a paragraph on a review within three years of new data on emissions is included. In a "whereas" paragraph, introducing the articles, references are made to those products included in the PARCOM Decision.

The Commissions proposal has been heavily discussed within the Council Working Group. However, no blocking minority has been reached for a proposal taking full account of the PARCOM Decision 95/1. Tabled for decision was the original Commission proposal with minor changes. The following change is appropriate to highlight in this context. The annex clause on a review, before 1 January 2003, includes that the European Commission in co-operation with Member States and OSPAR Commission should do this. The Council came to a political agreement with a view of a common decision on qualified majority on 30 May 2001. Belgium, Denmark and the Netherlands still have reservations. At present the proposal is for conciliation discussion between Council and the Parliament.

Within the recently decided Water Framework Directive a list of hazardous substances has been developed. A further, prioritising process of work has developed a list of priority hazardous substances. SCCPs are included on this list, which was decided on in June 2001 by the EU Council. Hazardous substances are defined (Directive 2000/60/EC) as "substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances, which give rise to an equivalent level of concern". These substances shall be subject to cessation or phase-out. OSPAR has taken part in the prioritising work.

3.2 Other existing or new measures and instruments

There is no satisfactory overview of the status of CPs implementation of PARCOM Decision 95/1. In Finland and the Netherlands, national restrictions equivalent to the PARCOM Decision, have been notified. In Norway such a proposal is under consideration. In Sweden, a complete phasing-out of uses of SCCPs has taken place by voluntary means. Further, 90 % of the use of medium- and long-chained chlorinated paraffins (MCCP and LCCP) have been phased out. An almost complete phase-out of SCCPs used for formulation of metal working fluids seems to have taken place in Germany and Norway. Corresponding phasing-out activities are also reported by Belgium and UK. There is no information on phasing-out activities in remaining CPs.

3.3 Alternatives

MCCPs, the medium-chained chlorinated paraffins (C_{14}-C_{17}) may have similar uses as SCCP and is used as replacements for SCCP as extreme pressure additives in metal working fluids, as plasticisers in paint, and as additives in sealants.

Reading the UK draft risk assessment on MCCP, in the framework of the Existing Substances Regulation, it is understood that some risk reduction measures may be required for uses in the production of PVC, in some process formulations of metal cutting fluids, in emulsifiable metal cutting/working fluids where the spent fluid is discharged to waste water, in leather fat liquors and in carbonless copy paper during recycling. The risk from use in oil-based metal cutting fluids may also be of concern. It is however too early in the process to conclude what the actual proposals on measures will be. According to comments from the UK, these considerations need to include potential implications of other substitutes to SCCP.

LCCPs, the long-chained chlorinated paraffins have, at least in Sweden, been used in some demanding applications in metal working fluids instead of SCCP. LCCPs are also suggested as replacements to SCCPs in the leather industry as well as in paint and coatings, in sealants and rubber.

Germany developed a separate document on MCCP and LCCP within the framework of OSPAR.

Alkyl phosphate esters and sulfonated fatty acid esters may function as replacements for SCCP as extreme pressure additives in metal working fluids. Natural animal and vegetable oils are alternatives in the leather industry. In paint and coatings, phthalate esters, polyacrylic esters, diisobutyrate as well as phosphate and boron containing compounds are suggested as replacements. Phthalates esters are alternatives for use in sealants. Alternatives as flame retardant in rubber, textiles and PVC are antimony trioxide, aluminium hydroxide, acrylic polymers and phosphate containing compounds. Sweden considers these substances as less harmful than chlorinated paraffins. Still, there might be uses for which these alternatives do not fulfil all technical and security demands. Neither may costs for substitution be proportional to health and environmental advantages for all types of applications. Risk reduction measures like closed production and/or further regulation of emission limits, are some of several measures that could be taken into account

4. PROPOSALS FOR POSSIBLE HELCOM ACTIONS

4.1 Evaluation of the need for actions at HELCOM level

Even if most HELCOM CPs will be bound to harmonised EU-restrictions on the marketing and use (76/769/EEC) of SCCP, it will not cover all CPs and the phasing out only deals with the most severe uses.

In light of the information so far collected on MCCP and LCCP by the UK (in her risk assessment of MCCP) and Germany (in the document “Draft OSPAR Background Document on the Grouping of Substances for Assessment Purposes, based on the example of Short-, Medium- and Long-Chained Chlorinated Paraffins (PDS 00/3/4)), further consideration on the whole range of chlorinated paraffins is likely to be needed.

New data on uses of SCCP in Europe 1998 shows an increasing category “other uses”. This category should be studied in order to find out what uses it is composed of, taking into account the uncertainties in data collection mentioned above.

Presently, one HELCOM Recommendation is related to SCCP, namely Recommendation 23/7, Reduction of discharges and emissions from metal surface treatment, where SCCP is meant to be included in the group of chlorinated organics mentioned.

There seems, thereby, to be a need for HELCOM to agree on its own for actions aiming for the HELCOM 2020 target.

4.2 Proposals for such HELCOM actions

As concluded above, work within the framework of Council Directive 76/769/EEC on restrictions on marketing and use is presently for conciliation discussion between Council and the Parliament. This proposal gives sufficient restrictions on the most important uses of SCCP by volume. The proposal further includes a review clause which gives the possibility within three years of the further inclusion of other uses, e.g. in products, such as plasticisers in paints, coatings and sealant and as flame-retardant in rubber, plastics and textiles.

Since it is not yet possible to judge to what extent measures resulting from the work in progress in the EC will enable the HELCOM 2020 target to be achieved for chlorinated paraffins, HELCOM is recommended in 2003 to review the outcome so far of:

- legislative actions on SCCP within the framework of Council Directive 76/769;
- the Water Framework Directive list on priority substances;
- the EU Risk Assessment and the possible Risk Reduction Strategy for MCCP;

and to consider the need for further actions in order to achieve the HELCOM 2020 target.

The existing HELCOM Recommendation 23/7 will probably not cover the actions needed to fulfil the HELCOM 2020 target with regard to SCCP, why preparing a Recommendation specific for SCCP is proposed.

Such Recommendation may contain the following items:

- Contracting Parties that are bound by PARCOM Decision 95/1 should increase their efforts to implement this Decision by national measures.
- All Contracting Parties should pay attention to identifying uses of SCCPs that have not previously been recognised. To this end, the Project Team on Hazardous Substances has initiated the development of a common strategy to obtain information on the occurrence of hazardous substances in markets, uses and environments in the Baltic region. This should be worked out together with all relevant stakeholders within two workshops. A concrete proposal has been submitted via the consultant COWI to EPA´s DANCEE.
- All Contracting Parties should put efforts into collecting information on the availability of, and experiences on the use of, technically and economically acceptable alternatives to SCCP. This information should preferably be included on the HELCOM web site.
- Contracting Parties should take action to ensure that any decisions on substitution take account of the fact that the work so far in the EU risk assessment of MCCPs has indicated a potential need for risk reduction measures for some of the uses of MCCP;
- In the light of the progress within the EU framework, develop further complementary actions, if appropriate.

5. LIST OF REFERENCES

EU Risk Assessment (1999): Short-Chained Chlorinated Paraffins, presented by UK.

HELCOM (2001a): 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.
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HELCOM (2001b): The Environment of the Baltic Sea area 1994-1998. Baltic Sea Environment Proceedings No. 82A. (http://www.helcom.fi/a/proceedings/bsep82a.pdf)

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HELCOM (2001d): The specific conditions in the Baltic Sea Region to be taken into account when selecting and prioritising hazardous substances for priority action. Submitted by Finland and WWF. (http://www.helcom.fi/a/hazardous/Specific_Conditions1.PDF)

HELCOM (2001e): Contracting Parties' submitted answers to the questionnaire.

Norwegian Pollution Control Authority (2001): Harmonised Quantification and Reporting Procedures (HARP-HAZ Prototype) – Hazardous Substances. ISBN 82-7655-416-4.

Swedish University of Agricultural Sciences (2000): Occurrence and Fate of Organic Contaminants in Wastes (Uppsala 2000).

US National Toxicology Program (2000): Organohalogen Compounds Volume 47 (2000)

6. ABBREVIATIONS

CEFIC	European Chemical Industry Council
CPs	Contracting Parties
CSTEE	EU Scientific Committee for Toxicity, Ecotoxicity and the Environment
Danish EPA	Danish Environment Protection Agency
EC	European Community
e.g.	exempli gratia / for example
EU	European Union
EU RAR	EU Risk Assessment Report
EuroChlor	European Chlor-Alkali Industry
g	gram
HELCOM	Helsinki Commission (Baltic Marine Environment Protection Commission)
IPPC	Integrated Pollution Prevention and Control
kg	Kilogram
l	Litre
LCCP	Long-Chained Chlorinated Paraffins
log K_{OW}	Logarithm of the octanol/water partition coefficient
MCCP	Medium-Chained Chlorinated Paraffins
mg	Milligram
µg	Microgram
NGOs	Non-Governmental Organisations
NP/NPE	Nonylphenol/Nonylphenolethoxylates
OECD	Organisation for Economic Cooperation and Development
OSPAR	Oslo and Paris Commissions
4^{th} PA	4^{th} Periodic Assessment
PARCOM	Paris Commission
PBT	persistent, bioaccumulative and toxic
PCBs	Polychlorinated biphenyls
PCNs	Polychlorinated naphthalenes
PVC	Polyvinylchloride
SCCP	Short-Chained Chlorinated Paraffins
t	Tons
UK	United Kingdom
WWF	World Wide Fund for Nature
y	year

ANNEX

Table I: Short-chained chlorinated paraffins (SCCPs). Data provided by HELCOM's Contracting Parties.

No.	Question	Denmark	Estonia	Finland
1.1a	Legislation and other measures concerning chemical products	There is no restrictions on the use or production of chlorinated paraffins.	The Chemicals Act (06.05.1998), and the Waste Act (10.06.1998) are giving the general guidelines and principles in dealing with chemicals and hazardous substances. But SCCP is not especially regulated.	The Council of State Decision aiming at implementation of PARCOM decision 95/1 has been notified to the EC
1.1b	Ban of the production/use of the substance	There is no restrictions on the use or production of chlorinated paraffins.	not banned/not regulated	
1.1c	Restricted use/import of the substance	In 1991 a voluntary agreement was conducted between the Danish EPA and the Danish PVC-industry.	not restricted safety requirements established for storages, depositories and for stowing of SCCP (regulation No 106 (6.12.2000) of the Minister of Transport and Communication	
1.1d	Use of economic instruments, voluntary agreements etc.	Voluntary agreements are currently in use.	Contracts between MoE and enterprises: enterprises don't have to pay pollution fees for certain amounts of pollution if they invest the equal amount of money into cleaner technology, more effective treatment of waste(water) etc, and thus reduce their emissions. The conditions and requirements for substitution of pollution fees are worked out case-by-case, keeping in mind the specific activities, technologies and used substances of an enterprise.	
1.1e	Planned measures and activities for implementation	Awaiting the new EU Directive on chlorinated paraffins.	to regulate SCCP by legal acts, improve data collection and information exchange	
1.2a	Regulation of industrial installations (permits). Please, indicate date of implementation of regulations.	discharging license, permits are granted by the county authorities	Discharges into environment are regulated through permitting system; issuers of permits are 15 County Environmental Departments of the Ministry of the Environment (water, waste, air pollution and integrated environmental premit).	
1.3a	Effectiveness of the implemented legislation/regulations		Permitting of emissions, list of hazardous substances, nomenclature of goods/products in place; however the SCCP is not "reportable" yet	
1.3b	Effectiveness of implementation of relevant HELCOM Recommendations		no data available	
1.4a	Information on production, industrial and consumer uses of these substances, including relevant modes of applications	Lubricants, cutting fluids and construction materials	no data available	The use of SCCPs was 840 t in 1988. The breakdown of the use was: paper industry 570 t (ceased in 1989), paint industry 190 t, metal working industry (cutting fluids) 35 t, placticizer 45 t. In 1997 the total use of SCCPs was 27 t. The breakdown was: paint industry 21 t, metal working industry 1 t, rubber and textile industry 5 t.
1.5a	Information on relevant discharges, emissions and losses from point sources and diffuse sources		no data available	
2.1a	Amount of import/export, production per year	early 90ies: use of SCCPs in the order of 75 t/y (Danish Product Register), end of the 90ies: consumption approx. 23 t/y. Late 80ies: consumption of chlorinated paraffins (all chain	no data available not produced in Estonia	

No.	Question	Denmark	Estonia	Finland
		lenghts in included) were estimated to be 150-200 t/y in one main metalprocessing industry. This company reduced the consumption to less than 10 t/y in the beginning of the 90ies. This is believed to be representative for the situation in main metal processing industries.		
2.2a	Amount of substances in imported chemical products, articles and goods	All consumption is imported. No info available on articles and goods	no data available	
2.3a	Amount of sales per year, specified for each use and mode of application	end of 90ies: consumption of lubricants & cutting fluids approx. 20 t (Danish Product Register); early 90ies: approx. 75 t/y. Estimation of the consumption include quite old notifications, real consumption is probably less than 20 t/y. A few other application areas are estimated to be 2-3 t/y.	no data available	
2.4a	Amount of stockpiling and its treatment of substances banned or restricted in use		no data available	
2.5a	Information on the amount of discharges to water/emissions to air and losses (from production, use, storage, transport and waste treatment) within the catchment area of the Baltic Sea		no data available	
2.6a	Information on illegal or unidentified uses (indication on such uses can be obtained e.g. from monitoring data)		no data available	
2.7a	Amount of administrative and financial resources needed for the implementation and supervision of measures described under 1.1. It is intended to get at least some rough estimation on these costs.		no data available	

In PARCOM Decision 95/1 the Contracting Parties agreed (reservations from Portugal and UK) on the phasing out of SCCPs, in particular those with carbon chain length between 10 and 13 and a chlorination level of > 50%. According to this decision, the SCCPs should be phased out by 31 Dec 1999 in metal working fluids and in major uses as plasticisers in paints, coatings and sealants and as flame retardant in rubber, plastics and textiles. The use as plasticers in sealants in dams and in conveyor belts for the exclusive use in underground mining should be phased out by 31 Dec 2004.

The EU risk reduction strategy recommends that, in order to protect the environment from the use and formulation of products, i.e. for use in metal working and leather finishing, restrictions on marketing and use within the framework of Council Directive 76/769/EEC should be considered for SCCPs. Therefore, the EU risk reduction strategy for SCCPs, adopted in July 1999, does not allow for a full implementation of the PARCOM Decision 95/1. The main emission sources (leather and metal working fluid) as determined by the EU risk assessment seem to be regulated by the Draft EU Directive amending Council Directive 76/769/EEC, however also environmentally open uses as considered in the PARCOM decision 95/1 should be included in the new Directive thus allowing a full implementation of the PARCOM Decision.

Table: Use of SCCPs in Europe [t/a] and total use [%] (Euro Chlor,1999).

Application	SCCP use [t/1994] within the EU	SCCP use [t/1998] within the EU
PVC Plasticisers	-	13 (0.3%)
Metal working lubricants	9,380 (71.02 %)	2,018 (49.5%)
Paints, adhesives and sealants	1,150 (8.71 %)	713 (17.5%)
	695 (5.26%)	
Rubber/flame retardants/ textile/polymers	1,310 (9.91 %)	638 (15.7%)
(other than PVC)	183 (1.4%)	
Leather fat liquors	390 (2.95%)	45 (1.1%)
Other	100 (0.75 %)	648 (15.9%)
Total	13,208	4,075

Release of CPs into the environment could occur during production, storage, transportation, industrial use, disposal and burning of waste and landfilling of products such as PVC, textiles, painted materials, paint cans and oils containing chlorinated carbons. The uses of chlorinated paraffins probably provide the major source of environmental contamination. For example, CPs effectively dissolved in polymers will leak into the environment very slowly, but might act as sources of chlorinated paraffins for centuries after disposal.

Table: Environmental release estimates for short-chained chlorinated paraffins (SCCPs) to water.

Application	SCCP - releases [t/a] based on sales figures of 1994 within the EU as prepared in the UK EU risk assessment.	SCCP - releases [t/a] based on sales figures of 1998 within the EU considering release factors used in risk assessments of SCCPs and MCCPs, prepared by the UK in 1998 and 1999, respectively.
Production	45	15
PVC Plasticisers	-	25 kg/a *
Metal working lubricants	23.45	5,045
	1688	363
Paints, adhesives and sealants	negligible	5**
Rubber/flame retardants/	< 12 kg/a	0.4***
textile/polymers (other than PVC)	negligible	negligible
Leather fat liquors	7,8	0.9
	19,5	2.25
Other	*not considered*	Production: 13****
		Formulation: 13
		Processing: 324
Total	**1784**	**742**

** only compounding and conversion considered*
*** service life of PVC and paints, adhesives and sealants*
**** derived from MCCP risk assessment*
***** default estimates according to the TGD*

The release calculated by in the framework of the EU existing substance risk assessment prepared by the UK was related to 13,208 t of sales and production in 1994. However, release during service life has not been considered in this risk assessment (leaching, evaporation, ...), neither the use in rubber, textiles and polymers corresponding to a sales amount of 3438 t/a in 1994. Since the release estimates for SCCPs are related to 4,075 t of sales in 1998, the same release factors as in the SCCP risk assessment may be considered. However, as additional releases due to polymer formulation, use and service life occur, release factors have also been derived roughly from the EU draft risk assessment report on medium chained chlorinated paraffins (MCCPs) prepared also by the UK in 1999. These releases are not considered to cover entirely possible releases during the service life of a SCCP containing matrix as only the amount of one year has been considered. Usually, the service life of 10 - 20 years should be considered. Here, only estimates based on 4,075 t of sales in 1998 are considered, which is not a worst case scenario. These estimations are not published elsewhere and should not be considered to be reliable but just very rough estimates. Another aspect of SCCP release to the environment has not be taken into account in the EU risk assessment which is waste disposal and waste treatment. During this life stage, considerable emissions may occur. The following estimates cover only the input into the water compartment. Considerable emissions will also occur into the air compartment. However, also SCCP contamination in the water phase is going to be removed to sewage sludge during waste water treatment through adsorption. Nevertheless, this removal can also be considered as an input into the environment.

Table I (cont.): Short-chained chlorinated paraffins (SCCPs). Data provided by HELCOM's Contracting Parties.

No.	Question	Germany	Latvia	Lithuania	Poland	Sweden	Russia
1.1a	Legislation and other measures concerning chemical products	At present, the use of SCCPs is not regulated.			not referred to in Polish law	According to the motives for the Swedish Environmental Bill 1990/91: 90 and the Swedish Governments Bill 1997/98 :145 on the Swedish Environmental Quality Objectives, the remaining use of SCCP shall be phased out by 2000.	
1.1b	Ban of the production/use of the substance	The PARCOM Decision 95/1 on the Phasing Out of SCCPs is applicable to Germany.			not banned		
1.1c	Restricted use/import of the substance	Production of SCCPs was stopped by the end of 1995 (other CP: end of 1998). Recently, Leuna Tenside GmbH has started the production of medium and long chained chlorinated paraffins, but not of SCCPs.			not restricted		
1.1d	Use of economic instruments, voluntary agreements etc.					Voluntary phase-out activities by importers, producers and users of chemical products, mainly driven by goal set by the Parliament in 1991: phase-out of SCCPs by 1994; phase-out of all chlorinated paraffins by the year 2000. The Swedish EPA and the National Chemicals Inspectorate often acted as a partner in those activities and in some cases the phase-out activity has been initiated by the authorities.	
1.1e	Planned measures and activities for implementation	PARCOM Decision 95/1 not yet implemented, preparation of the implementation of the Decision within the decided period of time (end of 1999). As an interim target for the year 2000, efforts have been focused on the main sources, as already outlined in PARCOM Decision 95/1.				awaiting the amendments to EC Directive on Limitations and Use (EEC 79/414) that would restrict the use of SCCPs.	
1.2a	Regulation of industrial installations (permits). Please, indicate date of implementation of regulations.					The Environmental Code, January 1, 1999	
1.3a	Effectiveness of the implemented legislation/regulations					The total use has been reduced with 90 % between 1990 and 1998. The use in metal working fluids has been reduced with 92 % during the same period. The goal of a total phase-out in chemical products is predicted to be met in the year 2001.	
1.3b	Effectiveness of implementation of relevant HELCOM Recommendations						
1.4a	Information on production, industrial and consumer uses of these substances, including relevant modes of applications	main uses: as extreme pressure additives in metal working fluids (MWF), further used as flame retardants and plasticisers in rubbers, paints and other polymeric materials, additives to adhesive and sealants. Minor amounts are used in leather processing and smaller amounts as secondary plasticisers in polyvinyl chloride (PVC) (Euro Chlor, 1999).	no use			There is no production of chlorinated paraffins in Sweden. Existing use areas: cables, floors, paint, metal working liquids, sealing compounds. The inflow from goods other than chemical products is not known	
1.5a	Information on relevant discharges, emissions and losses from point sources						

No.	Question	Germany	Latvia	Lithuania	Poland	Sweden	Russia
	and diffuse sources						
2.1a	Amount of import/export, production per year	In 1997 and 1998: total production of CPs in Europe was 134,000 - 139,000 t/a of which 114,000 t can be allocated to Western Europe. In Western Europe the production capacity for CPs is divided between 4 producers and 5 plants: ICI (UK and France), Caffaro (Italy), Leuna Tenside (Germany), Quimica del Cinca (Spain). The small production capacity of approximately 20,000 - 25,000 t in Eastern Europe is divided between Zaklady Chemiczne Oswiecim (Poland), Novácke Chemické Závody (Slovakia) and Syntez (Russian Federation). The sales of SCCPs was 13,208 t in 1994 (EU risk assess. 1998) which has been reduced to 7,371 t in 1997 and 4,075 t in 1998. The forecast of sales of SCCPs in 1999 is 2,000 t (Euro Chlor, 1999). Net reduction in SCCP sales but unknown 'other' uses are increasing considerably. (table)				There is no production of chlorinated paraffins in Sweden. In 1998, approx. 100 tonnes were imported as raw material.	
2.2a	Amount of substances in imported chemical products, articles and goods	Western Europe imports approximately 5,000 t of CPs, primarily from Russia, India, Taiwan and China. It exports approximately 25,000 t of CPs, mainly to Asia.				The inflow from goods other than chemical products is not known	
2.3a	Amount of sales per year, specified for each use and mode of application					Use area / t/1990 / t/1995 / t/1998 Metal working 500 40 41 Cables n.d. n.d. 0 Floors n.d. n.d. 0 Paint 200. 6 16 Sealing compounds n.d. 2 2 Total 630 - - Source: Kemi Report 6/97, complemented with recent data from KemIs Products register and contacts with industry.	
2.4a	Amount of stockpiling and its treatment of substances banned or restricted in use	CP-containing wastes e.g. metal working fluids with >2 g halogen/kg and halogen-containing plasticisers, are classified as potentially hazardous waste and are incinerated.					
2.5a	Information on the amount of discharges to water/emissions to air and losses (from production, use, storage, transport and waste treatment) within the catchment area of the Baltic Sea	No specific data are available for the Baltic catchment area. (table)					
2.6a	Information on illegal or unidentified uses (indication on such uses can be obtained e.g. from monitoring data)						
2.7a	Amount of administrative and financial resources needed for the implementation and supervision of measures described under question 1.1. It is intended to get at least some rough estimation on these costs.						