

Chemie außer Kontrolle

Das systematische Versagen der
EU-Chemikalienpolitik in den letzten 20 Jahren.
Mit zehn Fallstudien

Chemicals out of control

The systematic failure of
EU chemicals policy in the last 20 years.
With ten case studies

Chemie

Chemicals out of control

The systematic failure of EU chemicals policy in the last 20 years

Commissioned by Greenpeace Germany

Editor: Greenpeace Germany (Greenpeace e.V)., Große Elbstr. 39, 22767 Hamburg, Germany, Tel. ++49 (0)40/306 18-0, Fax ++49 (0)40/306 18-100, Email: mail@greenpeace.de, Political Berlin Unit, Chausseestr. 131, 10115 Berlin, Germany, Tel. ++49 (0)30/30 88 99-0, Fax ++49 (0)30/30 88 99-30, Internet: www.greenpeace.de; Authors: Andreas Ahrens and Kerstin Heitmann, Ökopol GmbH, Hamburg; Person responsible under German press law/V.i.S.d.P.: Manfred Krautter, Greenpeace Germany; Titel pictures: Hewetson/GP, C. Piecha/GP, G. Gilabert/GP; Printers: edp, Virchowstr. 12, 22767 Hamburg, Germany; Production numbers: 200; Date June 2003; Printed on 100% recycled papers.

Introduction

In spring 2001, the EU Commission published its White Paper on how it envisages the new strategy on chemicals in the future. The core of its proposals are aimed at giving equal status to all industrial chemicals on the market regardless of when they were first placed on the market. Thus industry will be obliged to fill the huge data and assessment gaps related to substances which were placed on the market before 1981. These substances are the so called "existing substances" and still account for more than 90% of the current market. When the EU chemicals legislation entered into force in the early 80s, the existing substances and their producers/importers were exempted from some of the key information requirements. In the early 90s, the authorities started a program to assess priority existing chemicals instead. However the program failed due to lack of data, very time consuming procedures and the sheer amount of work to be done.
The current proposals aim to shift the responsibility for data collection and assessment from the authorities to trade and industry. They include registering of all chemicals on the market in amounts exceeding one tonne per manufacturer, and a step by step assessment of these chemicals by the authorities. Furthermore, the use of very hazardous substances will in general be prevented, although in some cases authorisation for continued use in clearly-defined applications can be given or permitted for limited periods of time. The Commission further envisages its future chemicals policy being oriented on the precautionary principle and the substitution of hazardous substances by non hazardous alternatives.

It is not yet at all clear to what extent the Commission's proposals will in practice result in an actual reduction of risks from chemicals. This study aims to illustrate the present problems through examples of hazardous substances that are widely used in consumer products or the open environment. The new EU chemicals policy and its implementation by the Member States will have to be measured by whether it really does change the actual behaviour of producers and industrial users of substances.

The study puts special weight on visualising the problems and the connections between them, thus creating a better basis for public discussion.

The study is subdivided into a part dealing with chemicals policy (chapters 1 and 2) and a part with detailed accounts of substance (chapter 3), in which environmental data and market information on the ten substances selected has been systematically compiled.

The main part of the study gives an account of five types of products and the related problems for the environment and health. The sources of the data are mainly the (Draft) Risk Assessment Reports in the EU's *Existing Substances Programme*, OSPAR Background Documents on certain substances, the EU Commission's Study on the Prioritisation of Substances Dangerous to the Aquatic Environment (COMMPS Procedure) and the proposed Environmental Quality Standards (EQS) for priority substances under the Water Framework Directive. These documents include an evaluation of the available information from various sources and hence were regarded a good source for the current work. The emission data on released amounts of substances are very rough worst case estimates (modelling based) with high uncertainty, since measured data are often not available. These data are mostly based on the available (draft) EU Risk Assessments. The data on substance concentrations (measured) indicate a typical European pollution level in the 90s rather than local peak concentrations. For all substances selected in this report, the assessment processes at European level are still ongoing, and hence the data used may partly need revision or updating in future.

The subsequent chapters analyse the economic, legal and political reasons causing control over many industrial chemicals to have been lost in the last few decades. Based on this cases, it may be possible to draw conclusions related to the crucial issues in the new EU chemicals policy.

Summary of Conclusions

All 10 substances or groups of substances selected for this study are produced in, or imported to the European Union in high volumes (> 1000 t/a) by leading international chemical companies. At the same time, all have already been identified as hazardous substances requiring priority action under OSPAR's Strategy with regard to Hazardous Substances (to ensure protection of the marine environment), including the overarching objective of achieving cessation of all environmental releases by 2020.

Based on the 10 cases, some key conclusions can be drawn relevant in the context of the current debate with regard to a new chemicals policy in Europe.

- In all 10 cases examined there was a great lack of data on available substance properties. In addition the gaps in information related to use patterns of chemicals in Europe are at least as great as the lack of data on substance properties. This presents additional problems, not least in determining the sources of greatest exposure and in fulfilling the public's right to know and ability to make informed decisions regarding products.
- In all 10 cases the European Data Base on existing substances (IUCLID) was unable to provide up-to-date information on who places the substance on the European market. This lack of transparency makes it easy to continue the production or import of hazardous substances without the risk of being questioned by authorities or the public.
- All of the ten substances (or groups of substances) present significant hazard to the environment and human health as a result of their intrinsic properties Despite this, they remain in widespread use, often in high production volumes and in applications leading to direct human exposure and/or ongoing release to the environment.
- In seven of the ten cases, these hazardous substances are used in consumer products, providing a direct route for human exposure, through the skin or by inhalation or ingestion (e.g. DEHP in PVC products, musk compounds in cosmetics, nonylphenol-compounds in food-packaging, TBT/DBT in textile products).
- In none of the 10 cases does it seem possible to ensure "zero release" of chemicals from products, or even from so-called "closed loop" industrial systems. The most effective way to prevent exposure to these hazardous chemicals, therefore, is to ensure that they are substituted with less hazardous, or preferably non-hazardous, alternatives. This is the best way to ensure a "high level of protection for the environment and human health".
- The agricultural policy in the EU Member States, the regulation and practice of pesticide authorisation and the supervision of use by authorities have not prevented pesticides from occurring in food, rivers, groundwater and even the open sea.
- Contamination of water, sediments or the body tissue of humans and animals (including breast-milk) due to releases of hazardous chemicals is a widespread problem, but so far no companies have been held liable for this. There is currently no formal way to bring such liability cases, and this needs to be addressed urgently within the EU. At the same time, there is inadequate regulatory action and pressure to require, facilitate and ensure that hazardous chemicals are substituted in a comprehensive, timely and effective way.
- Serious and long-term environmental and human health impacts can result not only from chemicals with PBT properties. Chemicals possessing only some of these properties can give rise to an equivalent concern, for example if they are highly persistent and bioaccumulative alone or as a result of continuous high volume use and release.
- The comprehensive substance-by-substance assessment by the authorities, as required by current EU legislation, takes a very long time and has often delayed action by several

years. Moreover, there are many examples of inappropriate replacement of one hazardous substance with another (e.g. substitution of nitro-musk compounds with polycyclic musk compounds; substitution of short chain chlorinated paraffins [SCCP] by medium chain chlorinated paraffins [MCCP]) as there has been greater focus on endless assessment than on identification and development of non-hazardous substitutes.

- In five of the 10 cases metabolites are more toxic than the marketed substance itself (e.g. nonylphenol ethoxylates biodegraded to nonylphenol, diuron biodegraded to 3,4 dichloraniline). It can be expected that such effects may occur for many other chemicals as well since many currently used chemicals are not readily biodegradable and there are only few systematic studies available on possible degradation products..
- Neither existing chemical regulations nor voluntary actions by industry have so far managed to bring chemicals under control. Action by the public in encouraging and enforcing market substitution of hazardous chemicals is greatly limited by poor access to information on chemical hazards and the use of chemicals in products and/or their production processes.

These examples show the urgent need for the new chemicals legislation currently under development within Europe to be strong, timely and effective in addressing hazardous chemicals, *inter alia* by ensuring an obligation for the producers/importers of chemicals to register, and deliver sufficient data for a proper hazard assessment for, all substances produced or placed on the market (no data, no market).

It must be stressed that this study draws information primarily from documents available or still under development within the current EU system of chemical assessment, including draft risk assessments which may be subject to further revision. This has been necessary in order to summarise the most recent information available to assessors and decision-makers within the EU, and to highlight some of the fundamental data gaps which nevertheless exist in these dossiers and the assumptions which have therefore been made in order to carry EU assessments forward. Even for the well known hazardous substances used as case examples in this study, much of the information on production, use patterns and environmental concentrations is subject to large uncertanties. This is not a failing of the design of this study but rather a consequence of the limitations to knowledge which are inherent to the underlying EU assessments and other data sources, in turn a symptom of the failure of current chemical controls.

Schlussfolgerungen

Die 10 Stoffe oder Stoffgruppen, die Gegenstand dieser Studie sind, werden in der Europäischen Union von führenden internationalen Chemieunternehmen in großen Mengen (>1000 t/a) hergestellt oder importiert. Im Rahmen der OSPAR-Strategie (Oslo Paris Convention) zum Schutz der Meeresumwelt vor gefährlichen Stoffen wurde für diese Substanzen vorrangiger Handlungsbedarf festgestellt. Erklärtes OSPAR-Ziel ist es, dass sämtliche Emissionen dieser Stoffe in die Umwelt bis zum Jahre 2020 beendet werden.

Für die laufende Debatte um ein neues europäisches Chemikalienrecht können – ausgehend von diesen 10 Fällen - einige grundlegende Schlüsse gezogen werden:

- In allen 10 untersuchten Fällen gab es große Datenlücken, nicht nur im Hinblick auf die Eigenschaften der Stoffe sondern insbesondere auch hinsichtlich ihrer Verwendung. Diese Informationslücken erschweren die Identifizierung der wesentlichen Emissionsquellen, behindern Verbraucherinformationsrechte und erschweren Kaufentscheidungen auf der Basis angemessener Produktinformation.
- In allen 10 Fällen war die europäische Stoffdatenbank IUCLID nicht in der Lage, aktuelle Informationen darüber zu liefern, welche Unternehmen die Stoffe auf den europäischen Markt bringen. Dieser Mangel an Transparenz macht es einfach, ungestört von Behörden oder Öffentlichkeit weiterhin gefährliche Chemikalien zu produzieren oder zu importieren.
- Alle 10 Substanzen (oder Substanzgruppen) sind, aufgrund ihrer Eigenschaften besonders gefährlich für Umwelt und Gesundheit. Dennoch sind sie nach wie vor in Gebrauch, häufig in hohen Produktionsmengen und in Anwendungen, die zur direkten Belastung von Mensch und Umwelt führen.
- In sieben der 10 Fälle werden die gefährlichen Stoffe zur Herstellung von alltäglichen Konsumprodukten eingesetzt. Sie finden so über Haut, Atemwege oder Nahrungsaufnahme ihren Weg in den menschlichen Körper (z.B. DEHP in PVC-Produkten, Moschusverbindungen in Kosmetika, Nonylphenol-Verbindungen in Lebensmittel-Verpackungen, TBT/DBT in Textilien).
- In keinem der 10 Fälle scheint es möglich, eine „Null-Emission“ des jeweiligen Stoffes aus Produkten oder aus so genannten „geschlossenen Kreisläufen“ in Industrie-Anlagen zu gewährleisten. Der effektivste Weg, um den Eintrag gefährlicher Stoffe in die Umwelt zu verhindern ist daher, sie durch weniger gefährliche oder ungefährliche Alternativen zu ersetzen. So kann ein hohes Schutzniveau für die Umwelt und die menschliche Gesundheit erreicht werden.
- Die Landwirtschaftspolitik in den EU-Mitgliedsländern und die Regulierungs- und Überwachungsbehörden waren bislang nicht in der Lage, Pestizide aus Nahrungsmitteln, aus den Flüssen, dem Grundwasser und dem offenen Meer fern zu halten.
- Die Verunreinigung von Gewässern, Böden oder Menschen und Tieren (inkl. Muttermilch) durch freigesetzte, gefährliche Chemikalien ist ein weit verbreitetes Problem. Dennoch musste sich bisher kein Unternehmen dafür verantworten. Für solche Fälle gibt es derzeit keine Haftungsregelung. Gleichzeitig schafft auch der gegenwärtige ordnungsrechtliche Rahmen zu wenig Motivation, gefährliche Stoffe rechtzeitig und effektiv zu substituieren.
- Ernste und langfristige Folgen für Umwelt und Gesundheit können nicht nur von Chemikalien mit PBT-Eigenschaften (persistent, bioakkumulativ, toxisch) verursacht werden. Auch Stoffe, die nicht alle diese Eigenschaften gleichzeitig besitzen, können Anlaß zur Sorge geben. Beispielsweise, wenn sie sehr schwer abbaubar und sehr

bioakkumulativ (aber nicht toxisch) sind oder wenn Stoffe in sehr großen Mengen kontinuierlich freigesetzt werden.

- Die derzeit im EU-Recht geforderte umfassende Bewertung von Einzelstoffen durch die Behörden ist enorm zeitaufwändig und hat das notwendige Eingreifen oft über Jahre verzögert. Mehr noch: Es gibt zahlreiche Beispiele dafür, dass eine gefährliche Chemikalie durch eine andere ebenso gefährliche ersetzt wurde (z.B. Substitution von Nitro-Moschus-Verbindungen durch polyzyklische; Substitution von kurzkettigen Chlorparaffinen durch mittelkettige Chlorparaffine). Anstatt umweltverträgliche Alternativen entwickeln, lag das Schwergewicht auf der langatmigen Bewertung der gefährlichen Stoffe.
- In fünf der 10 Fälle sind die Abbauprodukte (Metaboliten) noch toxischer als die ursprünglich vermarktete Substanz (z.B. biologischer Abbau von Nonylphenol-Ethoxylaten zu Nonylphenol, oder von Diuron zu 3,4 Dichloranilin). Man kann davon ausgehen, dass solche Effekte auch bei anderen Chemikalien auftreten können, da viele im Einsatz befindliche Stoffe nicht gut abbaubar sind und bislang kaum systematische Studien über mögliche Abbauprodukte durchgeführt wurden.
- Weder das bestehende Chemikalienrecht noch freiwillige Maßnahmen der Industrie konnten bislang den sicheren Umgang mit Chemikalien gewährleisten. Die Möglichkeiten der Öffentlichkeit, den Ersatz gefährlicher Stoffe zu erzwingen sind begrenzt. Denn oft sind Informationen über die Anwendung und die Risiken von Chemikalien in Produkten und Verarbeitungsprozessen der Öffentlichkeit nicht zugänglich.

Diese Beispiele verdeutlichen, wie nötig ein neues und starkes EU-Chemikalienrecht ist, um den Risiken gefährlicher Stoffe rechtzeitig und effektiv begegnen zu können. Dazu gehört auch, dass die Produzenten und Importeure verpflichtet werden, ihre Stoffe zu registrieren und genügend Daten für eine vernünftige Risikobewertung zu liefern (keine Vermarktung ohne Information !).

Es ist darauf hinzuweisen, dass diese Studie in erster Linie auf Informationen aus der EU Altstoffbewertung beruht und teilweise Dokumente genutzt wurden, die sich noch in der Diskussion befinden. Das war notwendig, um die aktuellen, derzeit auf EU-Ebene zur Verfügung stehenden Informationen zusammenfassen und einige grundlegende Datenlücken in den Dossiers identifizieren zu können. Auch für die gut bekannten, gefährlichen Stoffe, die in der vorliegenden Studie als Fallbeispiele dienten, sind viele Informationen zu Produktion, Anwendung und Umweltkonzentrationen mit großen Unsicherheiten behaftet. Dies ist keine Schwäche im Ansatz der Studie, sondern schlicht die Konsequenz des begrenzten Wissens in den zugrunde liegenden EU-Stoffbewertungen und anderen Datenquellen. Die vorhandenen Informationslücken sind auch ein Zeichen für die Schwachstellen der heutigen Chemikalien-Politik.

Table of contents

1. Uncontrolled release of hazardous substances

Chemical substances which are persistent and accumulative and can have a harmful effect on organisms should not be released into the environment. This goal is now accepted in much of the chemicals industry and also stated in the Stockholm Convention on Persistent Organic Pollutants (POP), EU's pesticides Directive of 91/414 and the EU Water Framework Directive. Actual market activities in the EU and the way in which products are made and used shows however that neither present chemicals policy nor management practice in the industry are appropriate for attaining this goal. The aim here is to show with the help of a number of groups of products that the flows of chemical substances in the EU economic sphere are in major areas out of control.

1.1 Plastic additives

[=> see risk profiles on DEHP, chlorinated paraffin and brominated flame retardants in chapter 3.1 to 3.3]

The characteristics of plastic substances (polymers) can be modified with the use of additives. Plasticisers make them flexible, flame retardants give them low combustibility and stabilisers give stability in heat and UV resistance. PVC is the plastic which is by far the richest in additives. Typical additives are deposited in the plastic matrix but not firmly bound to it. Depending on the product's characteristics the additives can be released diffusely from the product during its life and/or will present a problem when the product is finally disposed of (e.g. release of metals and formation of dioxins during incineration). Today, diffuse emissions from final products are often more significant overall than point sources, like the production of chemical substances. Nevertheless, when plastic articles are processed local waters and soils may be substantially polluted by releases of plasticisers or flame retardant.

Table 1 provides some key figures related to hazardous properties of three relevant groups of additives, the market volume in the EU, releases and environmental fate of these substances.

When dangerous substances are introduced into consumer goods, diffuse losses to surface water and air of the order of one per cent or more per year can be expected (comparison of market volume and losses in the table). With market volumes of several tens to hundreds of thousands of tonnes per year, such releases constitute a considerable environmental and consumer burden. Since these substances only slowly degrade and tend to bioaccumulate at the same time, secondary poisoning via the food chain occurs, including contamination of human breastmilk. In the case of DEHP, a part of the body burden is likely to result from direct uptake, e.g. from cosmetics.

Table 1 – Plastic additives out of control (mid to end 1990s)

	Plasticiser DEHP	Brominated Flame Retardant	Plasticiser Chlorinated paraffins[1]
Half-life in water[2]	Months	Years	Years
Distribution[3] in mussels / water Distribution in fish / water (BCF)	2500[4] 840[5]	 60 – 14,000[6]	2.900 1,100[6]
Market volume in EU	480,000 t/a[7]	32,000 t/a[8]	56,000 t/a[9]
Entry into EU air and surface water[10]	5,600 t/a	200 – 300 t/a	550 t/a
Typical concentration in rivers (µg/l)[11]	1 – 10	too few data	0.1 – 0.5
Concentration in sediment mg/kg dw[12]	1 – 20	0.2 (90%); 0.1 (mean)[13]	0.3 – 1
Typical concentration in marine mammals, birds (mg/kg ww)[14]	2 – 13	0.1 – 7.7 (penta) (fat of marine mammals)	20–40 (fat of Beluga)
Breast milk µg/kg fat[15]	10 – 160	1 – 10 (tetra, penta, hexa)	13
PNEC[16] fresh water for pelagic community PNEC fresh water for aquatic food chain	Not suitable 0,33 µg/l	0.530 µg/l (penta) 0,0005 µg/l (penta)	1,0 µg/l
Hormonal-like effect	Yes	Yes	No evidence

[1] This is mainly medium-chain chlorinated paraffins used in plastic processing. Other uses of MCCP or use of long chain chlorinated paraffins is not included.
[2] For many industrial chemicals no half lives are from simulation tests on biodegradation are available yet. In these cases, estimates have been made based on OECD screening tests on degradation. If a substance has in four weeks not decomposed by more than 70% into CO_2 and water, it is regarded ***not readily biodegradable*** (decomposition by 50% lasting longer than a month) or not ***inherently biodegradable*** (decomposition by 50% lasting longer than a year), depending on the test conditions.
[3] enrichment in gill-breathing aquatic organisms compared to surrounding water.
[4] Draft EU Risk Assessment on DEHP, 2001
[5] Draft EU Risk Assessment on DEHP, 2001
[6] lowest figure for decabromdiphenylether, highest figure for pentabromdiphenylether [European Commission; Study on the Prioritisation of Substances Dangerous to the Aquatic Environment; 1999]
[7] Draft EU Risk Assessment on DEHP, 2001
[8] 44% of this being tetrabrombisphenol A (TBBA), 28% hexabromcyclododecan (HBCD), 26% decabrom-diphenylether and 2% penta/octabromdiphenylether according to the Draft EU Risk Assessments on Deca, Octa, TBBA and HBCD, 2002; and German Federal Environmental Agency (UBA), 2001
[9] Draft EU Risk Assessment on MCCP, 2002. The market volume relates to 1995, in 1997 it was 65.000 t/a.
[10] Rough calculation based on worst case assumption, as taken in the Draft EU Risk Assessments (not including releases to soil)
[11] Taken from various sources as indicated in the fact sheet appendix B2
[12] Taken from various sources as indicated in the fact sheet appendix B2
[13] total of 2,2,4,4 tetrabrombisphenylether, decabromobiphenyl, decabromdiphenylether and pentabromodiphenylether; decabromdiphenlyether having share of 97% [European Commission; Study on the Prioritisation of Substances Dangerous to the Aquatic Environment; 1999]
[14] Taken from various sources as indicated in the fact sheet in appendix B2, in particular OSPAR documents and Draft EU Risk Assessments on the relevant substance.
[15] Data from EU Draft Risk Assessments on the relevant substances (see appendix B4)
[16] The Predicted No Effect Concentration (PNEC) is based on long term studies on aquatic organisms and appropriate extrapolation factor. The figures in the table are based on EU Risk Assessments and proposed by the Fraunhofer Institute as environmental quality standards under the EU Water Framework Directive [Fraunhofer-Institute Molecular Biology and Applied Ecology: Identification of quality standards for priority substances in the field of water policy; annex 4; September 2002]. The MCCP data are directly taken from the EU Draft Risk Assessment on MCCP, 2002.

1.2 Metal products

[=> see risk profile on Cadmium in chapter 3.10]

The emission of lead and cadmium from major sources of emissions (non-ferrous furnaces, metal processing, fuel additives) has declined over 80 per cent in the last 15 years[17]. The use of lead and cadmium has also been confined to an increasingly narrow spectrum of product groups. Their major applications are today in storage elements for electrical energy (lead and nickel in batteries constituting 60 to 70 per cent of current usage), construction materials (lead), cables (lead), munitions (lead), fishing nets (lead), protection for surfaces in special uses (cadmium, lead) and PVC stabilisers. While the market volume of lead in Europe has slightly declined in the past 20 years, that for cadmium has stagnated at a high level.

The recovery and recycling of used products containing cadmium has so far remained under-developed. Against a European annual production of about 5,800 tonnes only 560 tonnes are recycled (2000)[18]. The collection rate for recycling from the private sphere is about 20 per cent of the amount sold in the EU (318 t/a Cd collected, 1,625 t/a sold in 2000)[19]. For the professional sector, recycling is not much higher (242 t/a compared to 846 tons). With lead the fraction of recycled lead in produced lead is much higher; in Germany, for example, it is 54 per cent[20]. This can be partly explained by the fact that the lead battery market involves a smaller number of units (300 to 350 million lead battery units compared to 1,400 million cadmium battery units, world wide), that the units are bigger, that the field of application has a low diversity (mainly cars), and that returning old lead batteries has been established practice for decades.

The stock of metals currently used will become waste in the next few decades. The waste stream is expected to be clearly higher than the remaining demand, hence re-collection of metals from products will be increasingly less economic to carry out.. Waste incineration plants, waste incineration slag, waste tips and products which remain in the environment after their service lives have ended will therefore continue to be sources of emissions in the future.

The sources of diffuse releases of lead and cadmium in urban areas include vehicular traffic (from brakes, tyres, car washes, road surfaces and fuel), pigments in exterior paints (lead), construction materials made of zinc (with cadmium impurities), and fertilisers (cadmium).[21]

In addition large stocks of metal have built up in the infrastructure the past few decades, causing constant diffuse emissions (surface erosion) into the environment have been built up from the use of metals in. Some 18 t of cadmium entered German waters in 1997, about 80 per cent from diffuse sources (30% from urban areas and about 30% from geogenic processes). The entry of lead in Germany was in 1997 about 500 t, roughly 90 per cent from diffuse sources (30% from urban areas and about 45% from geogenic processes). The amount contributed directly by industrial effluent was well below 10 per cent[22].

---

[17] German Federal Environmenal Agency (UBA): Texte 53/00: *Emissionsinventar Wasser für die Bundesrepublik Deutschland*

[18] Draft EU Risk Assessment on cadmium used in Batteries, August 2002

[19] Draft EU Risk Assessment on cadmium used in Batteries, August 2002;

[20] estimate for Germany, according to Working Group13 under the Governmental Commission for Waste Prevention of Lower Saxony, Germany

[21] Bergbäck, K et al: Urban Metal Flows – A Case Study of Stockholm; Department of Biology and Environmental Science, Kalmar University, Sweden

[22] German Federal Environmenal Agency (UBA): Texte 53/00: *Emissionsinventar Wasser für die Bundesrepublik Deutschland*

1.3 Process chemicals in industry

[=> see risk profiles of chlorinated paraffin and nonylphenol in chapter3.3and 3.4]

Process chemicals, which do not stay in products but after their use become industrial waste, are used in the manufacture of textiles, metal goods or other industrial products. Metal processing fluids and industrial cleaners are examples of these. Both kinds of chemical products are often introduced as a mixture with water, and after use (possibly with internal reprocessing) disposed of with the effluent. If substances which cannot degrade easily, for example nonylphenolethoxylate (industrial cleaner), or short to medium-chained chlorinated paraffins (metal processing emulsions), are used in these products, they will probably enter surface waters (from sewage plants) and soils (in reusing sewage sludge). In both examples the chemical products are so widespread that any use of them in closed systems tends to be the exception.

Table 2 – Process chemicals out of control (mid to end of 1990s)[23]

	Nonylphenol(ethoxylates) e.g. in industral cleaners	Chlorinated paraffins[24] in metal processing emulsions
Half-life in water	Months	Years
Distribution in mussels / water Distribution in fish / water	2,000 – 3,000 1,300	41,000 7,800
Market volume in EU	79,000 t/a	13,000 t/a (1994)
Entry into air and water [25]	850 t/a	1,150 t/a
Typical concentration in fresh water (µg/l)[26]	0.1 – 1	0.1 – 0.5
Typical concentration in sediment mg/kg dw[27]	0.2 – 2	0.3 – 1
Typical concentration in marine mammals, birds mg/kg ww[28]	No data; freshwater fish max. 1	25 – 50 (fat of Beluga)
Breast milk µg/kg fat	7.5[29]	10 – 16
Effect level in fresh water	0.3 µg/l (PNEC)	0.5 µg/l (PNEC)
Hormonal-like effect	Yes	No evidence

[23] Data mostly taken from Draft EU Risk Assessment; other sources indicated in the factsheets in appendix B 2
[24] mostly short-chain chlorinated paraffin in mid of nineties, compared to the release of MCCP (see table 1) this figure may be an overestimation for the second half of the 90s due to ongoing substitution processes.
[25] Roughly calculated worst case figure, based on information in the EU Risk Assessment.
[26] compiled from various sources, as indicated in the fact sheet in appendix B 2
[27] compiled from various sources, as indicated in the fact sheet in appendix B 2
[28] compiled from various sources, as indicated in the fact sheet in appendix B 2
[29] based on 0.3 µg/l as in: Guenther, K. et al: Endocrine Disrupting Nonylphenols are Ubiquitous in Food; Environ.Sci.Technol., 36(8), 1676-1680,2002;

1.4 Cosmetic products and detergents

[=> see risk profile of musk compounds in chapter 3.5]

After use chemical components in detergents and cleaning agents are all released into waste water or absorbed in the human body. While the tenside components in detergents and cleaning agents for domestic use are today easily biologically degradable on account of legislation to this end made in the 1970s, synthetic fragrance additives are not. Musk compounds (mainly galaxolide and tonalide), some 2000 tonnes[30] a year of which are used in the EU, can only partially be eliminated by adsorption in sewage plants, and only to a small extent by biological degradation (50–80%). In addition nitro-musk compounds produce toxic degradation products soluble in water. Musk compounds can on account of their fat-like properties be directly absorbed through the skin or enter the human organism via the environment after accumulating in the food chain. While the marketing of nitro-musks has sharply declined during recent years, the polycyclic musks are still used in large amounts.

1.5 Agricultural pesticides and biocides

[=> see risk profile of 3,4 Dichloranilin, Trifluralin, Dicofol and TPT in chapter 3.6 to 3.9]

Certain chemical substances are used to kill "harmful" organisms through being biologically highly active. That is, they attack and harm organisms' metabolism. Some 730 of these substances are currently authorized as pesticides in the EU, with the number of active substances licensed rising roughly by a factor of three from north to south/west (northern countries: 140-150 substances; Belgium, Ireland and the UK: 300 - 330; France 435 and Spain 486)[31]. The overwhelming number of pesticides authorised today have not been adequately analysed as to their behaviour and impact on the environment, particularly where atmospheric transportation and decomposition in the environment are concerned. The table below gives an overview of data from monitoring freshwater in European rivers (1994 – 1998) as assessed by the COMMPS[15] procedure, insofar as these data provide suitable indication of regional background pollution by authorised pesticides (with monitoring stations in at least three EU countries, over 100 monitoring stations, homogeneity of the data used, authorised in at least eight countries in January 2001). In 4.3 % of food sold in Europe maximum residues of pesticides are exceeded (DG SANCO, Annual EU Wide Pesticide Residue Monitoring Report 2000).

Table 3 – Detection of authorised pesticides in European rivers [EC 1999)][32]

	Number of measurement Points in ... countries	**number of samples over detection limit (% of total)**	**90% of measurements < ... [µg/l][33]**	**Mean of measurements[µg/l]**	**Concentration [µg/l] where no effect predicted (PNEC)**
Atrazines	1010 (9)	13,803 (43%)	0.33	0.05	0.8
Gamma HCH	860 (9)	8,538 (50%)	0.04	0.01	0.29
Simazine	880 (9)	4,867 (30%)	0.22	0.05	0.7
Dimethoathe	250 (5)	593 (25%)	0.15	0.01	0.2

[30] OSPAR 2001

[31] http://europa.eu.int/comm/food/fs/ph_ps/index_en.htm

[32] European Commission: Study on the Prioritisation of Substances Dangerous to the Aquatic Environment; Revised proposal for a list of priority substances in the context of the water framework directive (COMMPS procedure); 1999

[33] not all measurements by member states have been entered here; what has been used is only that part of the collected data which is sufficiently homogeneous for the purpose of statistical evaluation. The total number of measurements includes also data points where the substance was not detected.

	Number of measurement Points in ... countries	**number of samples over detection limit (% of total)**	**90% of measurements < ... [µg/l]**[33]	**Mean of measure-ments[µg/l]**	**Concentration [µg/l] where no effect predicted (PNEC)**
Diuron	106 (5)	573 (43%)	1.08	0.23	0.05
Fenitrothion	565 (5)	447 (6%)	0.03	0.01	0.009
Isoproturon	106 (5)	376 (27%)	0.37	0.11	0.3
Parathion ethyl	328 (5)	755 (13%)	0.02	0.01	0.005
Pentachlorphenol	584 (5)	1,749 (13%)	0.13	0.07	0.2
Dichlorvos	559 (4)	531 (7%)	0.05	0.01	0.006
Endosulphan	710 (4)	167 (1%)	0.06	0.005	0.005
Trifluralin	752 (4)	819 (6%)	0.03	0.005	0.03
Azinophos-methyl	502 (3)	817 (12%)	0.01	0.01	0.02
Bentazon	152 (3)	723 (29%)	0.86	0.02	80
Diazinon	86 (3)	112 (15%)	0.03	0.008	0.003
Mecoprop	362 (3)	2,465 (37%)	0.81	0.07	5

Although about 730 pesticides have been authorised in the EU, representative data for only 17 pesticides in European rivers is available. The pesticides listed in Table 3 were in January 2001 licensed in at least eight EU countries. The mean concentration of all 16 active substances is between 10 ng and 600 ng/l. For some of the pesticides, this indicates high quantities and wide disperse use, for other substances it may indicate that they are quite persistent and mobile in the environment. About 75 per cent of these substances have been measured in an average concentrations at a level that is close to or above the concentration at which adverse effects cannot be excluded[34].

Some 2,050 active chemical substances are used in 10,000-20,000 different biocide products in the EU[35]. Since there was no authorisation requirement for many biocide uses up to now a systematic and quantitative overview on the most relevant active substances is lacking. One of the most well-known and harmful biocides is tributyl tin, which in the past few decades has been used in large quantities in antifouling paints and protection for materials (textiles and wood). The smallest quantities of TBT have a toxic effect on all aqueous organisms (like e.g. algae) thus preventing them from settling on wet surfaces such as ships' hulls, tents or the facades of buildings. TBT can however also be used as a disinfectant in sportswear or bathroom items. It has a harmful effect on the immune system of mammals and the reproduction of molluscs.

The biocide TBT is chemically closely related to other organotin compounds (dibutyl tin or monobutyl tin) which are used as stabilisers in plastics or as catalysts. These substances are also toxic and moreover can become contaminated with TBT during their production.

With little control over the use of butyl tin compounds in the last few decades, these substances are now to be found in many everyday products everywhere (see list of products in section appendix B 2).

[34] Predicted No Effect Concentration
[35] TemaNord 2000:550

2 Analysis of problems

The characterisation of risks related the production and use of ten selected substances (or group of substances) illustrates where policies are deficient in implementing the precautionary approach and supporting safe use of chemicals.

2.1 Uncontrolled use of hazardous substances

It has become almost impossible to discern an overall pattern in the use areas of chemical substances which have now been on the market for decades. For many substances there are some types of uses where safe handling is possible (e.g. by professionals in closed manufactured processes) in other types of uses it is not (open handling or untrained people). There has been a lack of effort and instruments in limiting the use of chemical substances to those applications they are made for and where safe handling is possible. A good example of this is the use of plasticisers, which are harmful to reproduction, in children's toys, food processing and inside buildings people live in.

The fact that butyl-tin compounds are found extensively in diverse consumer items is a clear indication that the control of these chemicals has failed so far. The simultaneous use of substances of the same chemical family (tributyl tin and dibutyl tin) for various types of functions (UV and heat resistance in plastics, as catalysts in plastic production or as biocides) has resulted in a situation, where neither the producers and the industrial users, nor the consumers or the authorities can be sure which product contains which amount and type of organotin compounds. This is further complicated by the fact that substances which are chemically closely related are often contaminated with one another (for example one per cent of tributyl tin in dibutyl tin, or over 50 per cent lower brominated isomers in commercial octabromdiphenyl ether).

Chemical manufacturers do not have adequate long-term information on market volumes and use patterns of their products, or don't want to make this data accessible to the authorities or the public. For example:

- there is a lack of data on the amounts of Diuron used in particular countries (e.g. Germany) and in important areas of use outside agriculture (as a weed-killer and an anti-fouling substitute for TBT);
- there is a lack of data on the historical development of production volumes and use patterns of substances, such as cadmium or lead, which are used in goods with a long life.

2.2 Lack of data on characteristic properties of substances

Today, there is still a lack of basic data on the environmental behaviour and possible biological effects of most existing substances. Even among the 2,500 quantitatively most important chemicals in the EU, complete data on characteristics relevant for the environment is available for only five per cent, basic data required by law for 31 per cent and absolute minimum data is only on hand for 57 per cent.[36]

Even where the molecular structure and physical-chemical characteristics of a chemical substance and its use pattern suggest that it might accumulate in the environment, manufacturers have so far failed to adequately examine the risks. Thus, taking industrial chemicals as an example, only rarely information is available on the degradability in the atmosphere, their toxicity for sediment organisms, or possible impacts on marine mammals or birds. Plasticisers like DEHP and medium-chain chlorinated paraffins are examples ofthis lack of knowledge.

[36] European Commission: Public Availability on EU High Production Volume Chemicals; 1999

2.3 Hazardous substances not recovered at the end of service life

The manufacturers of chemical substances don't "think through" the path their products take till the end of their service lives. This is evident, for example, for the non-functioning recovery systems for batteries containing cadmium and plastic products containing heavy metals. Lead still accumulates in the technosphere, landfills, buildings, technical installations and vehicles. Its accumulation can produce critical emissions in the future even if rates of loss are relatively low.
A further example of lack of responsibility is the waste disposal of certain products containing flame retardants. Manufacturers have only started to acknowledge that waste disposal is a major aspect of producer's responsibility under the pressure of EU waste legislation, like for example on end-of-life vehicles (ELV) or electronic waste.

With all semi-volatile organic substances[37] used in large quantities such as additives in polymers there is the additional problem – as with plasticisers like DEHP and chlorinated paraffins – that they can escape from waste sites with landfill gas. There are hardly any data on the temporal dynamics of these emissions and the contribution they make to overall releases.

2.4 Limited liability

The multitude of synthetic chemicals in ecosystems, food, and the environments in which people live and work mean that only in the rarest cases can chronic damage without doubt be traced back to a specific chemical made by a specific manufacturer. The risk of being confronted with liability claims when their products appear in river water, groundwater, fish, seals or human breast milk (like for example with DEHP, chlorinated paraffin, nonylphenol or musk compounds), is accordingly low for most manufacturers. And since it is not forbidden for industrial chemicals, pesticides and pharmaceuticals to appear in the environment, far remote from the location of use, they do not need to fear repercussions in the form of legal penalties either. This means that neither lack of planning in the product's life-cycle nor lack of control on flows of substances have led to sanctions which might systematically enter into an enterprise's financial calculations (in the form of insurance premiums, for example). Thus, there is virtually no sufficient economic incentive to develop "inherently safe" chemical products or systems for their use[38].

2.5 Exposure of consumers and the environment as a result of high market volumes

Some existing substances are placed on the market on a scale of several hundreds of thousands of tonnes per year, and are widely distributed through society as a component of complex products. Phthalates and lead are examples of substances marketed in such very high volumes. Their mobility and/or eroding conditions under which they are used cause diffuse losses from surfaces which result in their widespread occurrence in the environment. If chemical substances are placed on the market in such volumes and become so widespread in society a "closed system" is almost impossible to implement. Such substances must accordingly be "inherently safe", a developmental goal which until now has hardly been

[37] Organic substances which are less volatile than solvents but nevertheless the vapour pressure is high enough, to enter into the atmosphere (in particular at increasing temperature). They may possibly deposit again on soils and water.at decreasing temperatures.
[38] The properties of "inherently safe" products (chemical, physical, toxicological) should ensure that safe use is possible without significant risk management efforts.

realised by manufacturers.
An indicator of the diffuse release of high-volume, semi-volatile substances and metals is their concentration in sewage sludge, household dust and dust in the outside air in cities. Given the large amounts in which these chemicals already exist in long-life products and landfills, concentrations may increase further in the next few decades even if their use were to slowly decline. The still ongoing practice in the EU of deploying sewage sludge in agriculture can cause additional contamination of soils and the food produced on them.

2.6 No incentives to use less hazardous substitutes

The aim of the present risk assessment program for existing chemicals in the EU and the resulting marketing and use restrictions is still to determine the absolute risk from a substance in each area of use. The threshold at which interventions are made is relatively high, and the burden of proof lies with the authorities. This is due to the fact that for substances which were placed on the market before 1981 manufacturers are not legally obliged to examine the "safety" of the products the substances are contained in.

Incentives for industry to develop and use alternatives are therefore very low. Examples of the extremely slow substitution of dangerous substances by already available alternatives in Europe include: substitution of stabilisers containing cadmium and lead in PVC products, nonylphenolethoxylates in cleaning agents, brominated flame retardants in plastic products, and organotin compounds in biocide paints. All four problem areas have been a public issue, at least in Germany, the Netherlands and the Nordic countries, since the mid-1980s.

2.7 Encouraging new markets for hazardous substances

The evaluation of existing substances currently practised in the EU establishes the necessity of taking measures to reduce risks related to particular uses or particular single substances. The use of short-chain chlorinated paraffins in metal processing fluids, for example, has been banned. Other areas of use remain and the producers may indeed extend such applications so as to make sure existing productions capacities are used. In addition short-chain chlorinated paraffins are being substituted by medium-chain paraffins although they likewise display a PTB[39] profile, albeit with lower bioaccumulation factors. A similar process can be observed with musk compounds. Despite being greatly similar in their PTB profile, the use of nitro-musk compounds is declining, but polycyclic musk compounds continue to be used (see section 2.2 in part B).

A process of substitution which in each case has contributed nothing towards a long-term solution has also occurred with brominated flame retardants in the past 15 years. Polybrominated biphenyls were replaced by diphenylether and then to some extent by tetrabrombisphenol A and various other brominated organic compounds. Industry has increased the level of bromination in substances in order to reduce their mobility and bio-availability. This has resulted in increasing the halogen content of waste streams. In the case of decabromdiphenyl ether there are moreover signs that transformation processes take place in the environment, increasing its biological availability (through loss of bromine atoms), without this leading to complete decomposition[40]. There is also emerging evidence of the presence of decabromdiphenyl ether in certain birds of prey at the top of the food chain - a further illustration that such substitution strategies are not working in the long term.

[39] persistent, bioaccumulative, toxic substance
[40] Draft EU Risk Assessment Report on Decabromdidphenylether, 2001

2.8 Release of persistent synthetic substances continues to be allowed

There is basically a limit to the predictability of the long-term environmental impacts of chemical substances foreign to nature. Chemicals which cannot be degraded quickly in the environment and are furthermore available to organisms constitute a risk. Two particularly important groups of hazardous substances ought not to enter the environment:

- biologically highly potent substances like pesticides, biocides, pharmaceuticals, veterinary pharmaceuticals and a number of (unintentionally) biologically active industrial chemicals (e.g. hormone-like substances such as nonylphenol) which do not sufficiently quickly degrade in the environment and
- persistent chemicals and by-products which tend to bio-accumulate and can therefore in the long term exceed critical concentrations at the higher stages of the food chain (like for example short chain chlorinated paraffin or pentabromo diphenylether).

Nevertheless, persistent and bioaccumulative substances are still used outside closed facilities, with the consequence that they reappear in animals, food or breast milk. Short-chain and medium-chain chlorinated paraffins are found in a variety of products (e.g. plastic, metal processing, leather processing), as are musk compounds in cosmetics and nonylphenolethoxylates in cleaning agents.

Substances which are designed to intervene in biological processes (e.g. pesticides or pharmaceuticals) are in many cases so widely used and/or so slowly degrading in rivers that concentrations clearly exceed the 0.1 µg/l level[41] in European rivers.

2.9 Hazardous decomposition products (metabolites)

When tests on biological degradability are interpreted, too little attention is still paid to the creation of toxic and possibly persistent and/or mobile decomposition products. Often it has been concluded from a relatively rapid primary decomposition of a chemical in a laboratory test that the substance presents no problem for the environment. Because of this wrong presumption in a whole series of cases taking measures to minimise risks has been delayed for many years. The biggest proportion of 3,4 dichloraniline concentration in rivers, for example, stems from the decomposition of the pesticides and active substances in the biocides diuron and trichlorcarbanilide[42]. A major source of nonylphenol concentrations is the biodegradtion of nonylphenolethoxylates. A further example is the possible debromination of highly brominated flame retardants under environmental conditions, resulting in an increase of their biological availability.

Table 4 - Decomposition products cause environmental problems

Substance in commercial products	Function of substance	Hazardous decom-position product	Additional hazardous feature as a result of decomposition
Nonylphenolethoxylate	Surfactant	Nonylphenol	Slow decomposition Bioaccumulation

[41] EU threshold for the quality of water intended for drinking water production; this threshold is however not necessarily protective for water ecosystems.
[42] EU Risk Assessment Report on 3,4 Dichloranilin, 2001

Substance in commercial products	Function of substance	Hazardous decom-position product	Additional hazardous feature as a result of decomposition
			Endocrine effect on fish Chronically very toxic for algae
Linuron, diuron, trichlorcarbanilides	Pesticide, biocide	3,4 dichloraniline	Bioaccumulation Endocrine effect on fish
Musk xylene Musk ketone	Fragrance	Amino-musk Compounds	Increase in ecotoxicity
Decabromdiphenyl ether	Flame retardant	Tetra- to octa-bromdiphenyl ether	Bioaccumulation Increase in ecotoxicity

2.10 Lack of access to information on evaluation of substances

Public access to existing information on pesticides is still very limited. While the evaluation process for priority industrial chemicals has become relatively transparent and accessible for the public, pesticides continue to be evaluated "behind closed doors" (in the majority of cases). But in the evaluations of industrial chemicals, too, certain information is treated as a commercial secret (for example substances' accumulated market volume and pattern of use) without manufacturers having produced evidence of the need for this information to be protected in any specific case. The lack of information on the use of substances in products means that eliminating hazardous substances from products and processes cannot be supported enough by market forces, while the authorities at the same time do not have the necessary resources to bring about a comprehensive "cleansing" of the market.

3. Risk profiles

The mistakes made in chemicals policy in the last few decades will here be illustrated by referring to ten mass-produced chemicals which have been chosen as representative. A graphically illustrated risk profile for each substance has been worked out, using available information mainly from risk assessment processes at EU and OSPAR level (including Draft EU Risk Assessment) applying the same method of data presentation for all substances. Where easily accessible risk assessment data is lacking, the gaps in information are noted. The risk profiles are based on market conditions in the mid 1990s. The information sources are listed under each substance factsheet in appendices B3 and B4.

3.1 Phthalates

Phthalates are synthetic organic mass-produced chemicals which in the EU have a market volume of about one million tonnes. In the mid 1990s about half this amount was DEHP. There are ten or more manufacturers in Europe.

DEHP is used predominantly in plastic articles made of PVC in which phthalates act as a plasticiser. This means that when added it gives the plastic material the flexibility it technically needs. In terms of quantity, the most significant articles containing DEHP are floor coverings, wallpaper, soft profiles (i.e. doors, windows, etc.), cables, shoe soles and coated fabric (tarpaulins, tents, lorries, raincoats). DEHP is also used in paints and sealants.

DEHP has various problematic characteristics. It is not chemically bound to the plastic matrix but is slowly released into the environment, this happening more forcibly when used outside than when inside buildings. Under environmental conditions it does not degrade quickly in water or sediments. DEHP also tends to accumulate in the body fat of aquatic organisms, although it doesn't appear to biomagnify in the higher levels of the food chain. DEHP's high market volume and mobility mean that it is to be found in relatively high concentrations almost everywhere - in river water > 1 µg/l, sediments and organisms > 10 mg/kg, breast milk > 100µg/kg of fat. DEHP has been detected in significant concentrations in remote water environments like for example the open sea.

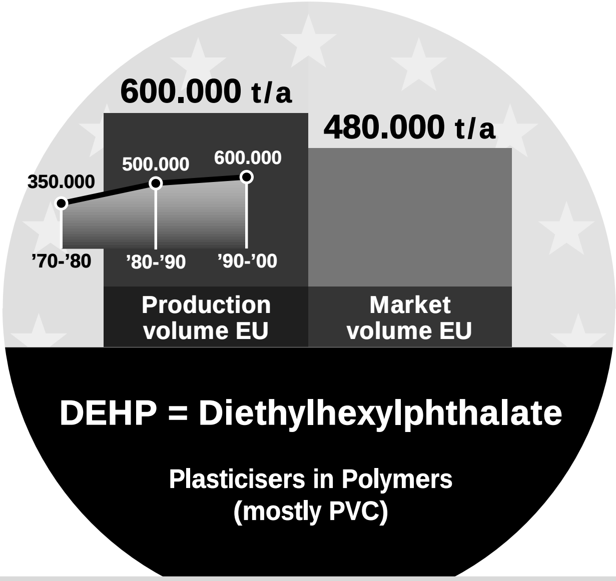
Based on laboratory tests DEHP is classified as toxic to reproduction (impaired fertility, category II) due to its effects on rodents. Investigations are currently being made on its possibly harmful impacts on fish in water ecosystems. Exposure to consumers (in particular infants) through food, the living environment and breast milk is regarded a risk of concern.

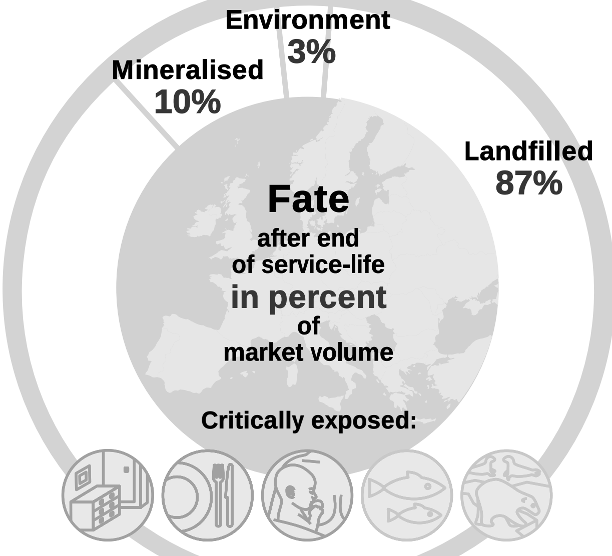
Given the widely dispersed use of DEHP, the number of industrial processors of polymer products containing DEHP may be several ten thousands of companies. The number of potential end users is in effect the population of the EU. This means very many people come into direct contact with DEHP.

If it has not been released into the environment during product service life or remains in it at the end of its service life (as for example with abrasion from roof surfaces or as a component in underground cables), DEHP is disposed of as domestic or construction waste (after 5-30 years). Again, several thousands of disposal companies are involved in this in Europe.

The amount of DEHP directly released into the environment (air, water and soils) is estimated at about three per cent of its market volume per year; some 87 per cent ends up in landfills and only about ten per cent is actually mineralised at waste incineration and thus rendered harmless. The amount of DEHP entering European soils via sewage sludge which is used as fertiliser in agriculture is not known.

Phthalates out of control





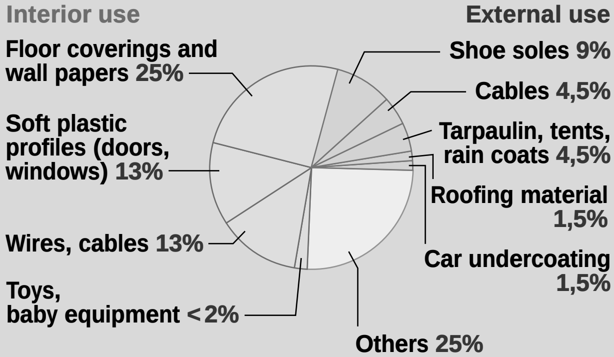
Producers

BASF AG, D, E; **BP Chemicals,** UK; **Celanese,** D; **Driftal GPD,** P; **Elf Atochem,** F; **Industrie Generali Spa,** I; **Lonza,** I; **Neste Oxo,** E; **Neste Oy,** FIN; **Oxeno Olefinchemie,** D; **Plastificantes de Lutxana,** E; **SISAS Pantochim,** B; **SISAS,** B

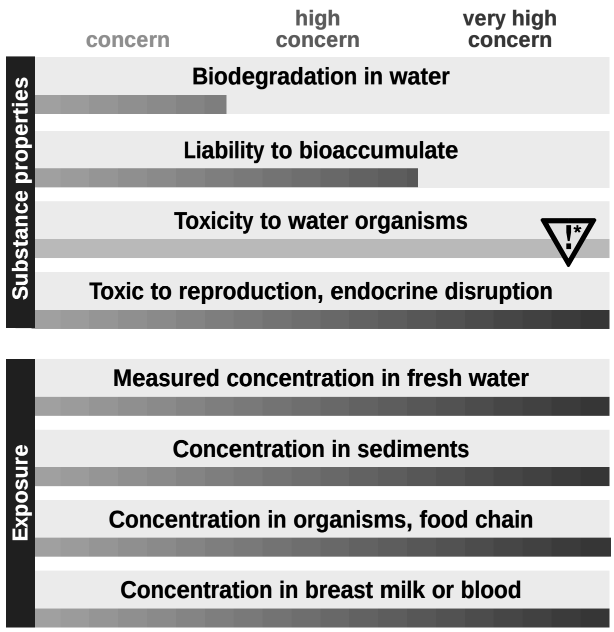
Some producers may have changed their names or their business.
Information sources on producers in data annex 1

Most relevant uses

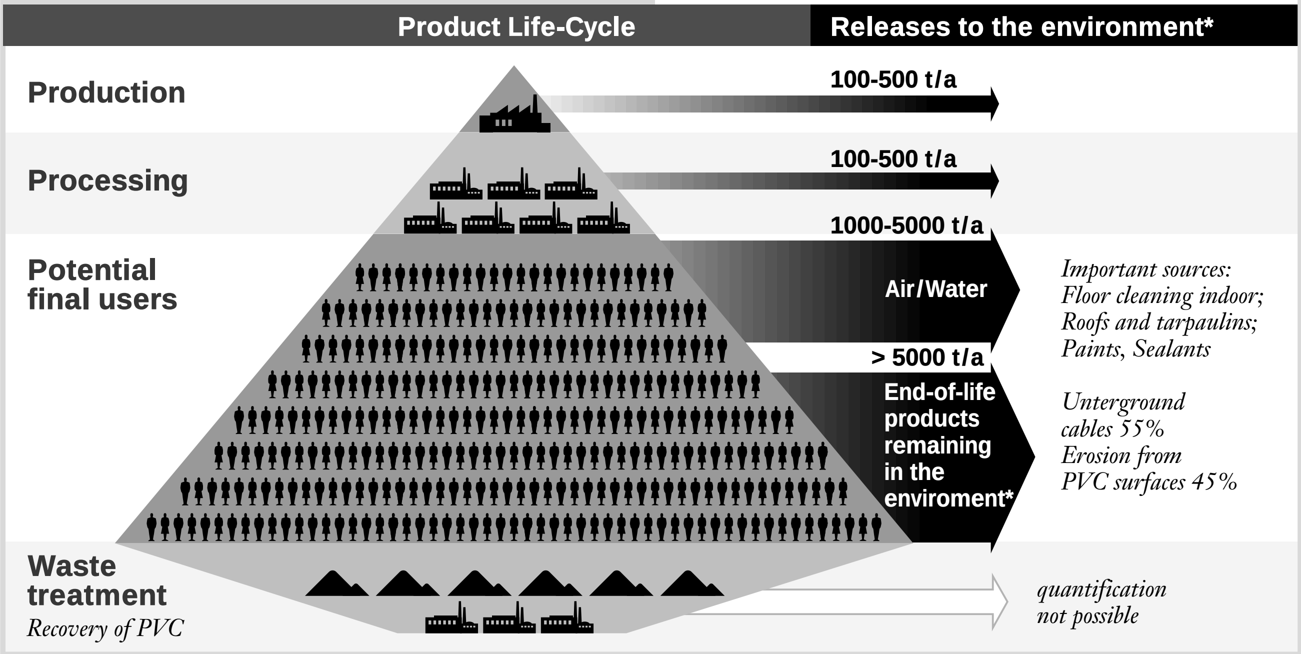
In % market volume



Risk-Profile



!* *= relevant lack of data*



3.2 Brominated flame retardants

Brominated flame retardants are a group of synthetic organic mass-produced chemicals which have a market volume of about 32,000 tonnes per year in the EU. About half of this is tetra-bromobisphenol A, and a quarter decabromodiphenylether. Only two manufacturers are left in Europe, most of the market volume is imported from the USA.

Brominated flame retardants are used mainly in electronic printed circuits and other components, materials for casings and housings made of polystyrene, and insulating materials made of polystyrene (styropor) and aimed at providing protection against flammability. But flame retardants are also used in upholstered furniture, car seats and textiles.

Brominated flame retardants have various problematic characteristics. More than half of the market volume is not chemically bound in the plastic matrix (an exception being TBBA in most of its applications), and is therefore slowly released into the environment. In sewage plants and under environmental conditions brominated flame retardants are persistent in water or sediments. In addition, lower brominated compounds also tend to accumulate in body fat of aqueous organisms and biomagnify in the food chain. Also, with higher brominated substances like Decabromodiphenylether, there is growing evidence that they enter into the food chain. They have for example been detected in falcon's eggs. There are moreover indications that highly brominated compounds (decabromodiphenylether, for example) slowly debrominate in the environment and form toxic, biologically available compounds. Compared to other plastic additives such as plasticisers, their concentrations in the environment and in humans are typically lower - in river water < 0.1 µg/l, sediments and organisms 1-10 mg/kg, and breast milk 1-10 µg/kg of fat. This is because of the lower market volume and because they are not used in outdoor applications. Also, the release rates of highly brominated compounds are lower since they are less mobile.

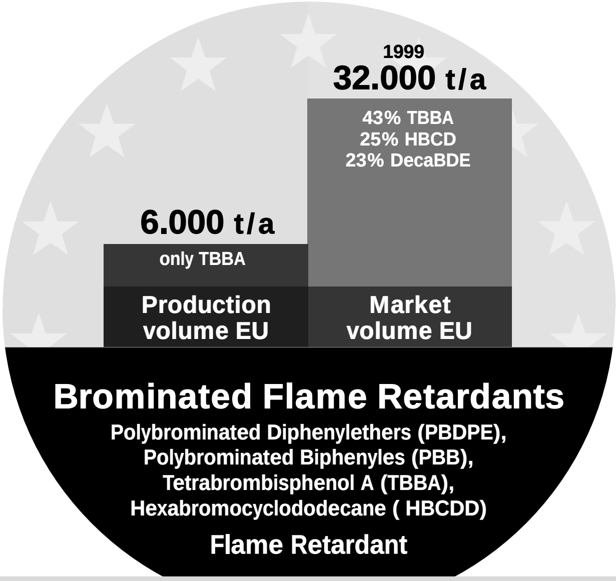
In laboratory tests four and fivefold brominated diphenylether can cause changes to the behaviour of rodents. But knowledge of such effects in general is still quite fragmentary. According to the EU's criteria, octabromodiphenlylether is to be classified toxic to reproduction (developmental effects, category II). These compounds are very toxic to aquatic organisms (threshold for chronic effect $\ll 10$ µg/l). The exposure of sediment organisms, marine mammals, birds, and babies via breast milk is considered to pose a risk of concern.

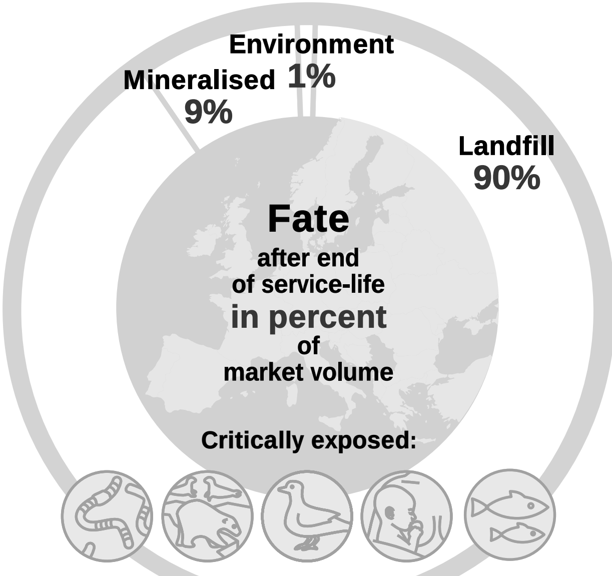
Given the broad uses involved, the number of the industrial processors of brominated flame retardants in the EU can be put at over a thousand companies. The number of potential final consumers is the population of the EU. This means very many people come into direct contact with these substances. At the end of their service life, articles containing flame retardants are disposed of as domestic waste, construction waste or electronic scrap. Again, several thousands of disposal companies are involved in this in Europe. In addition, electrical and electronic articles are also separately recovered and recycled. Recycling workers can become contaminated and emissions of brominated dioxins and furans can occur. The number of companies involved in electronic scrap in the EU is estimated to be well over a hundred.

The part of market volume released into the environment (air, water and soils) is estimated at up to one per cent per year; some 85 per cent ends up at waste disposal sites and less than ten per cent is actually mineralised in waste disposal operations. In addition, dismantling and recovery operations may lead to emissions containing brominated flame retardants (dust) or highly toxic products like dioxins and furans.

The amount of brominated flame retardants entering European soils via sewage sludge which is used as fertiliser in agriculture is not known.

Brominated Flame Retardants out of control





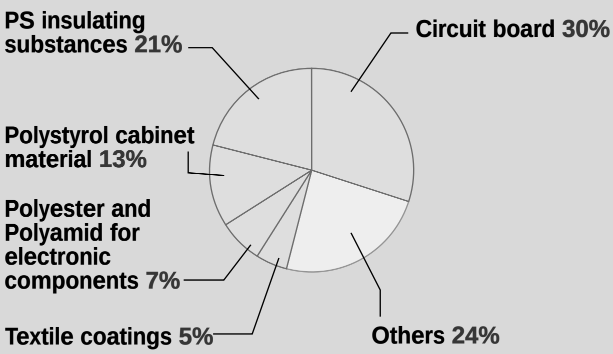
Producers

Broomchemie/Dead Sea Bromine Group, NL (HBCD);
Great Lakes Manufacturing Ltd., UK (HBCD)

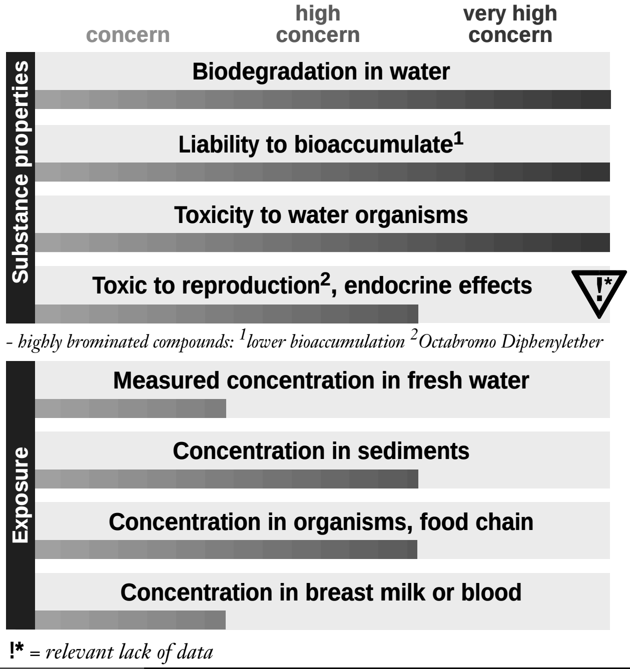
Some producers may have changed their names or their business. Information sources on producers in data annex 1

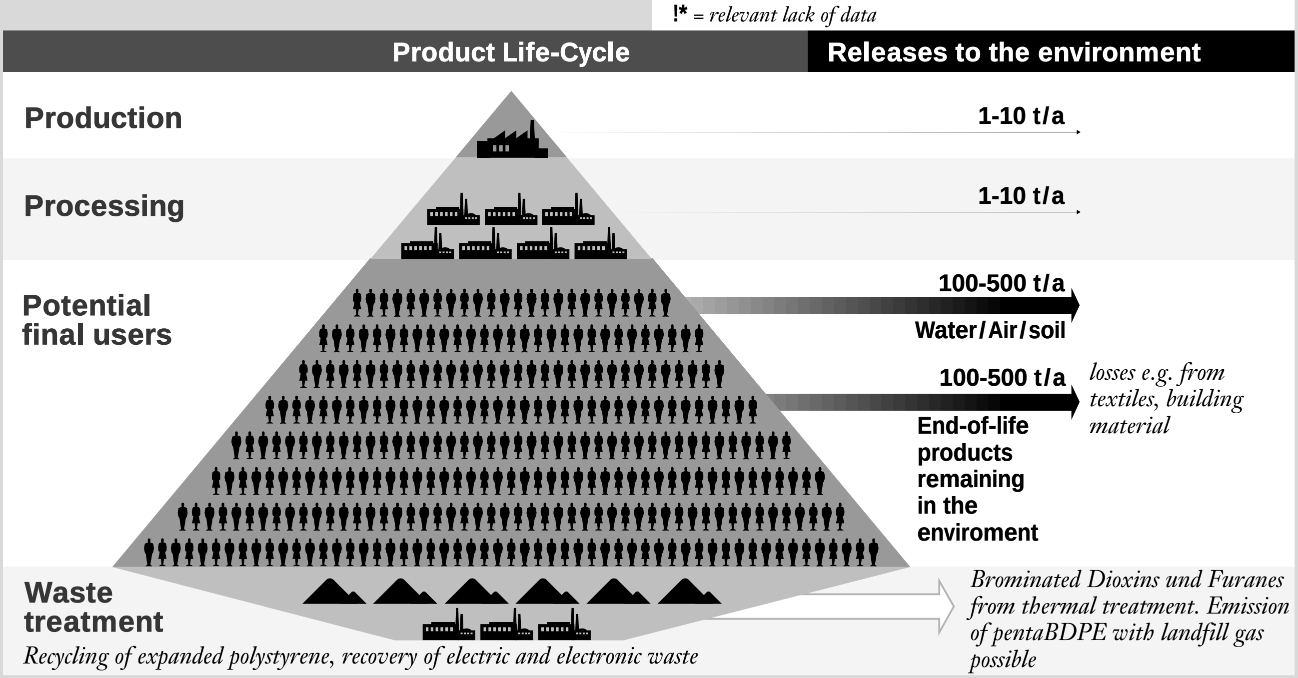
Most relevant uses

In % market volume



Risk-Profile





3.3 Chlorinated Paraffins

Chlorinated paraffins are synthetic organic mass-produced chemicals which have a market volume of between 60,000 and 70,000 tonnes per year in the EU. Production appears to be slightly declining. There are four companies in Europe producing short and medium chain chlorinated paraffins. The volume produced is about twice the amount used in Europe.

Chlorinated paraffins are used mainly in plastic articles made of PVC, in which they act as a flame retardant and/or plasticiser. They ensure the technically needed flexibility of the plastic (e.g. in cables). Chlorinated paraffins are also used in paints and sealants. Other important areas of use are metal cutting fluids and leather fattening liquor.

Short and medium chain chlorinated paraffins have various problematic properties. As plastic additives they are not firmly bound to the plastic matrix and are slowly released into the environment, more so when used outside than in indoor uses (like DEHP). In sewage plants and under environmental conditions chlorinated paraffins are persistent and can be transported over long distances. In addition, they tend to accumulate in the body fat of aquatic organisms and to biomagnify in the food chain. Chlorinated paraffins are found almost everywhere, due to discharges from the use as metal cutting fluid and through losses from the use as additive in plastic products. Most notably, however, they accumulate in the food chain, and are found in the following concentrations levels: in river water 0.1-1 µg/l, sediments 0.1-1 mg/kg, marine mammals > 10 mg/kg, and in breast milk > 10 µg/kg of fat.

On account of their effects on rodents in laboratory experiments chlorinated paraffins are suspected as being toxic to reproduction and carcinogenic (class III). They are very toxic to aquatic organisms. The contamination of breast milk and the pollution of surface waters is regarded a risk of concern.

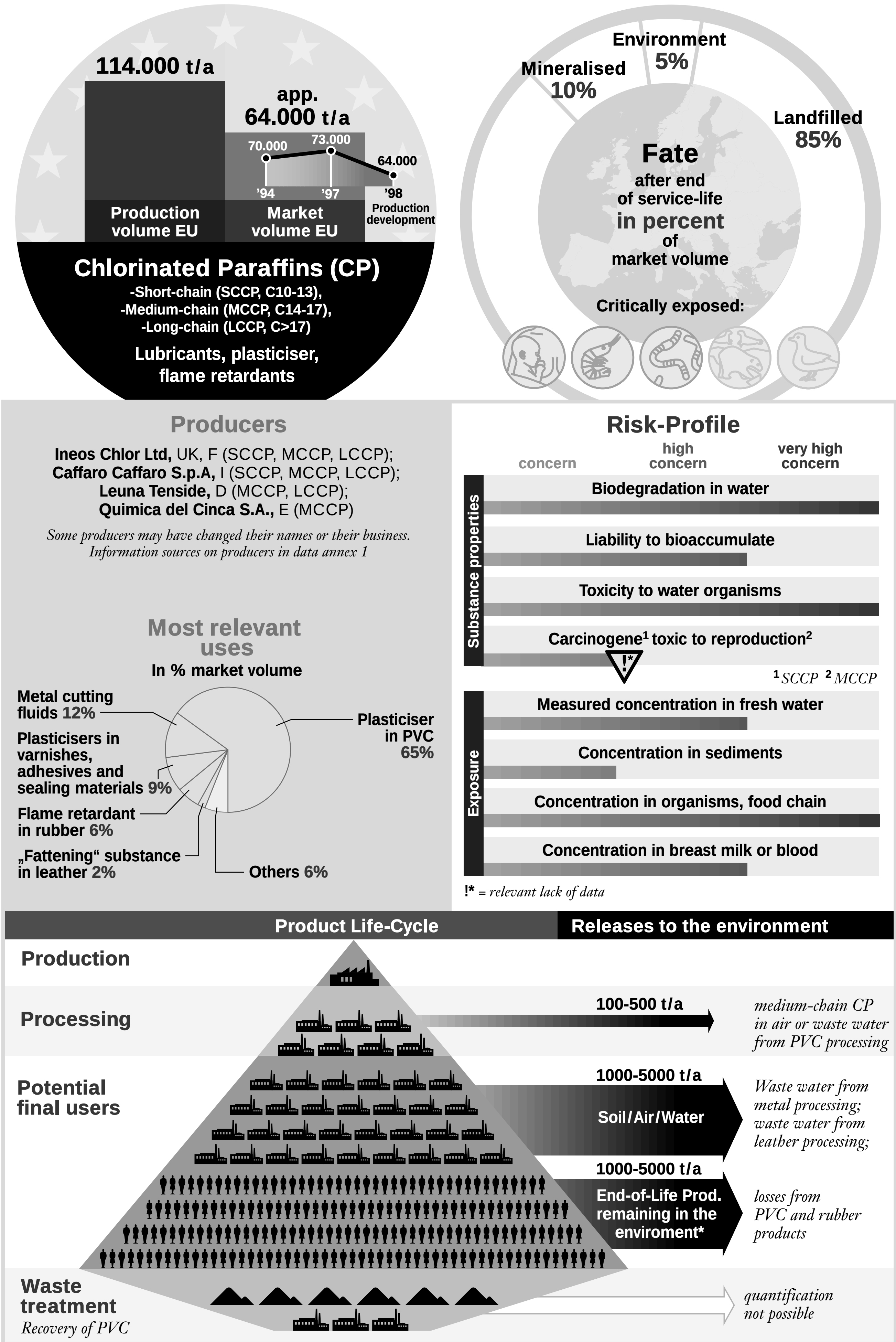
Given the widely dispersed use of chlorinated paraffins, the number of industrial plastic processors potentially using short and medium chain chlorinated paraffins is estimated at several thousands of companies in the EU. The number of companies using chlorinated paraffins in formulating lubricants and other chemical products could also be over a thousand. The number of potential end-consumers is the population of the EU. This means very many people can come into direct contact with chlorinated paraffins.

Chlorinated paraffins which have not been released into the environment during service life or which permanently remain in the environment as components in certain articles (as abrasion from roof surfaces or underground cables) are disposed of as domestic or construction waste (after 5-30 years). Again, several thousands of waste management companies may be involved in this in Europe. Chlorinated paraffins in the oil fraction of metal cutting fluids are usually incinerated as industrial waste, but a more or less high proportion is first allowed to enter sewage after chemical-physical waste treatment (water phase after separation of oil).

About five per cent of the market volume per year is directly released into the environment (air, water and soils); some 85 per cent ends up on landfills and only about ten per cent is actually mineralised in waste disposal operations.

The amount of chlorinated paraffins entering European soils via sewage sludge which is used as fertiliser in agriculture is not known.

Chlorinated Paraffins out of control



Stand: 3/2003 © GREENPEACE

3.4 Nonylphenol compounds

Nonylphenols or nonylphenolethoxylates (a product in the further processing of nonylphenol) are synthetic organic mass-produced chemicals. The market volume of nonylphenols is approximately 80,000 tonnes per year in the EU, produced by two European companies.

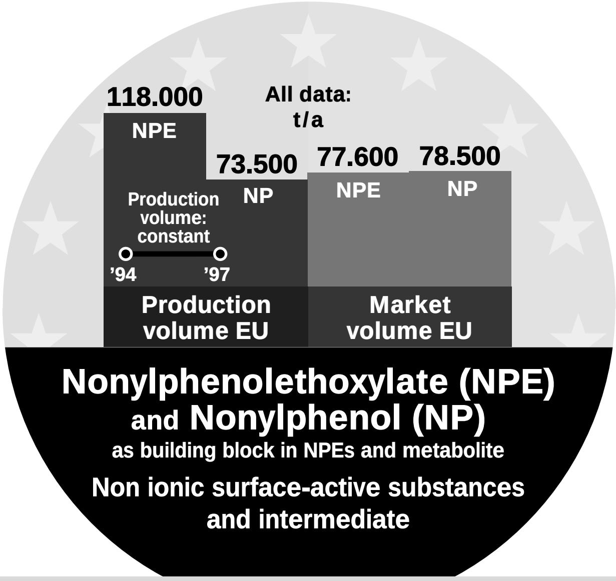
The main areas of use of nonylphenols or nonylphenolethoxylates are industrial and commercial cleaning agents, auxiliary materials used in making plastic products (e.g. food packaging), textiles, leather, and as a component in paints and pesticides.

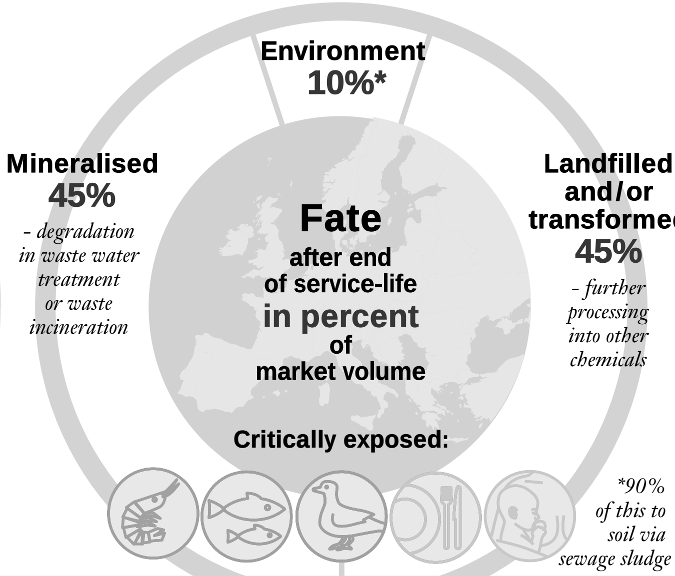
Nonylphenols and nonylphenolethoxilates have various problematic characteristics. As an additive or unintended impurity in textiles or plastics they are not fixed but are slowly released into the environment, especially in washing processes. When contained in cleaning agents or processing fluids they are released directly into the sewage system. In sewage plants and in the environment nonylphenolethoxylates do degrade relatively quickly, but at the stage of nonylphenol the biodegradation halts and then proceeds much more slowly. Additionally, nonylphenols tend to bioaccumulate in the body fat of aquatic organisms. Due to its pattern of use, nonylphenol is found in practically all rivers, in the following typical concentrations: in river water 0.1-1 µg/l, sediments > 1 mg/kg, and in fish > 1 mg/kg. Nonylphenol is very toxic to aquatic organisms. It is suspected to be toxic to reproduction (impaired fertility and developmental effects, category III) based on animal testing. Additionally, hormone like effects on fish have been measured in the environment. Contamination of surface waters poses a risk to aquatic organisms and to organisms higher in the food chain (e.g. fish eating fish).

Due to the widespread use of nonylphenol and products containing it, the number of industrial users is estimated at being many thousands of companies in Europe. The number of potential industrial users comprises practically the whole commercial sphere. In addition every EU citizen can come into direct contact with nonylphenol(ethoxylates) through residues in food, plastics or textiles. There is some indication that the concentration of nonylphenols in human breast milk is in the range of 1 to 10 µg/kg fat (figure recalculated to fat content of 4%). Due to the use of Nonylphenol compounds in packaging material, food products are contaminated with nonylphenol up to a level of some 10 µg/kg fresh weight (Guenther, K. et al, 2002).

According to rough estimates about ten per cent of the market volume per year is released directly or indirectly into the environment (water and soils); some 45 per cent is processed into other products or ends up in landfills; about 45 per cent is actually mineralised in waste water and waste disposal and so rendered harmless.

Nonylphenolethoxylate out of control



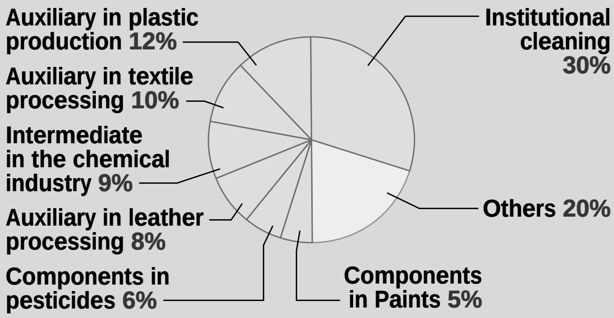


Producers
of Nonylphenol

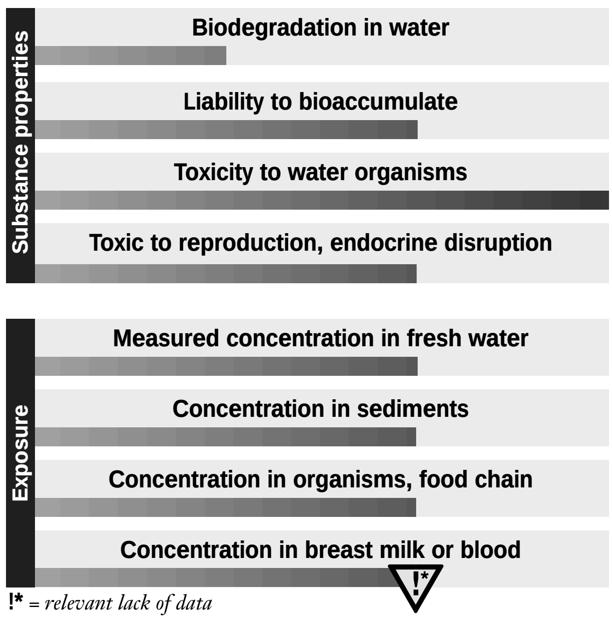
Sasol GmbH (ehem. Hüls AG) D;
Enichem S.P.A., I;

Some producers may have changed their names or their business.
Information sources on producers in data annex 1

Most relevant uses
In % market volume

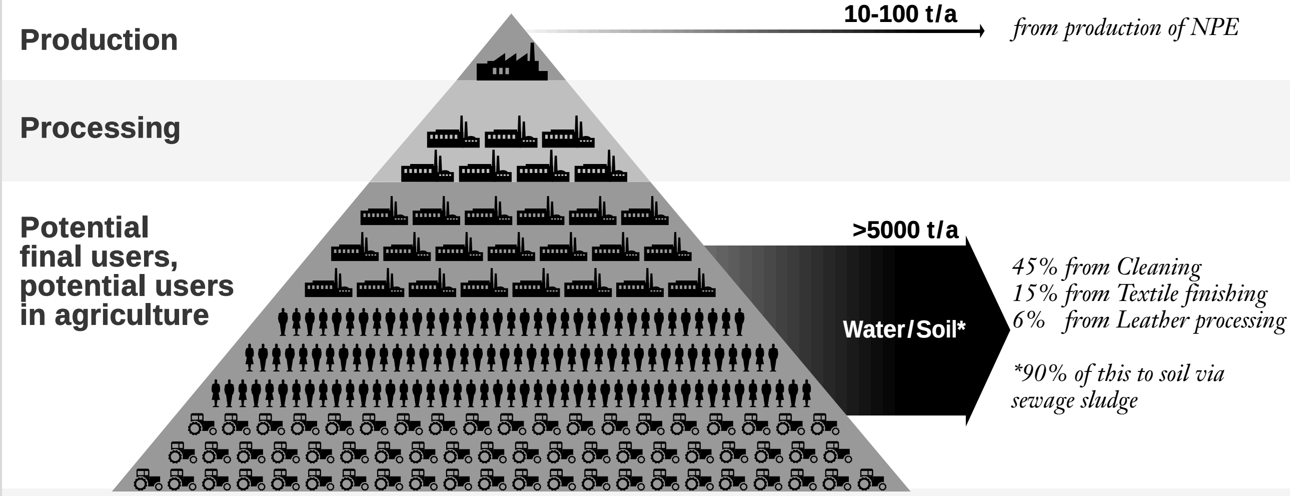


Risk-Profile



!* = *relevant lack of data*

Product Life-Cycle | **Releases to the environment**



Waste treatment — **No major relevance**

3.5 Musk compounds (Nitromusk and polycyclic musk compounds)

Musk compounds are synthetic organic chemicals, the market volume of which is about 1,400 tonnes per year in the EU. The proportion of nitromusk compounds in this has now dropped to below five per cent of the market volume. There are three producers in Europe and a few importers.

Synthetic musk compounds are used as a scent in cosmetic products and detergents owing to the great outlay required in obtaining natural musk scent.

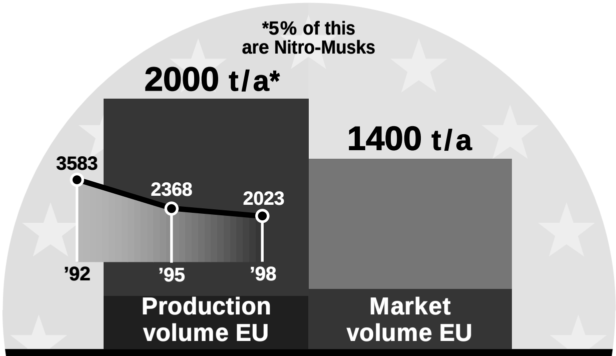
Musk compounds, especially nitromusk compounds, have a number of problematic characteristics. Under environmental conditions, synthetic musk compounds only slowly biodegrade in water or sediments, and in sewage plants are not completely eliminated. In addition, musk compounds tend to bioaccumulate in the body fat of aquatic organisms. Due to their pattern of use, musk compounds are found in practically all rivers. The concentration of nitromusk compounds has markedly declined in recent years. Today the concentration levels are < 0.1 µg/l in river water and < 0.1 mg/kg in sediments and in fish. The high concentrations found in breast milk are most likely due to direct absorption through the skin. However, the environmental concentration of polycyclic musk compounds can be much higher, by a factor of 10 or more based on the market volume and in havingvery similar properties to nitro musks.

Musk compounds are very toxic to aquatic organisms. Based on animal studies, nitromusks are suspected of possibly causing cancer (carcinogen category III).

The number of industrial users of musk compounds is estimated at over a thousand. The number of potential end-users is effectively identical to the population of the EU.

Roughly calculated, the share of musk compounds directly or indirectly released into the environment (water and soils) is about ninety per cent of their market volume per year, most of this however is released via spraying of sewage sludge as a fertiliser onto agricultural soil; only about ten per cent is actually mineralised in waste water treatment.

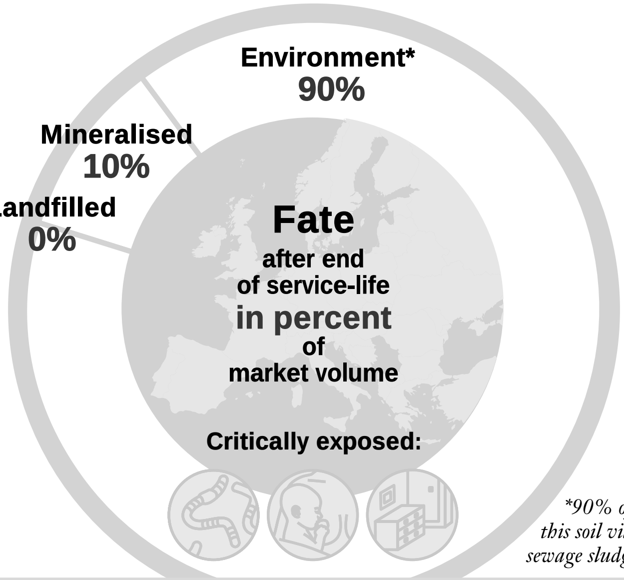
Musk compounds out of control



Musk-Components

- Nitro-Musks (Keton und Xylene)
- Polycyclic Musks (HHCB, AHTN)

Substitute for natural musks in the odourants industry



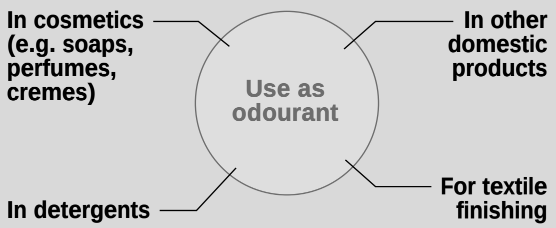
90% of this soil via sewage sludge

Producers and Importers

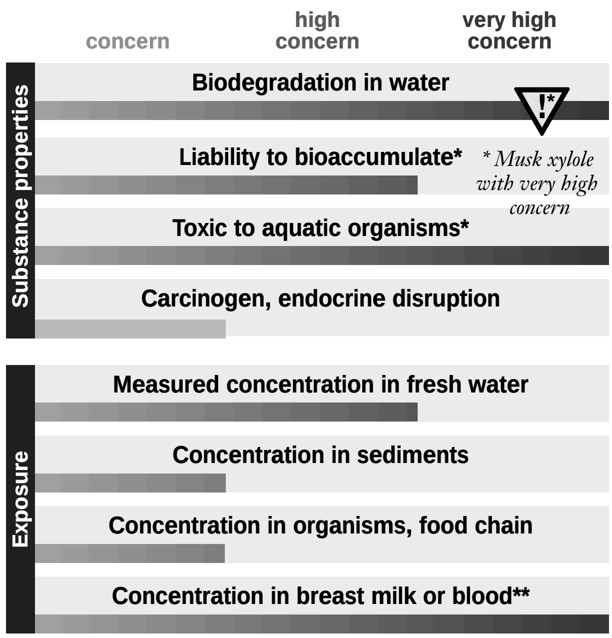
Bush Boake Allen LTD, UK (HHCB, AHTN);
Haarmann & Reimer, D (HHCB);
International Flavours and Fragrances, UK, NL, IR (HHCB);
Firmenich & Cie, F (HHCB);
Quest International, UK (HHBC);
Givaudan, CH (AHTN)

Some producers may have changed their names or their business. Information sources on producers in data annex 1

Most relevant uses



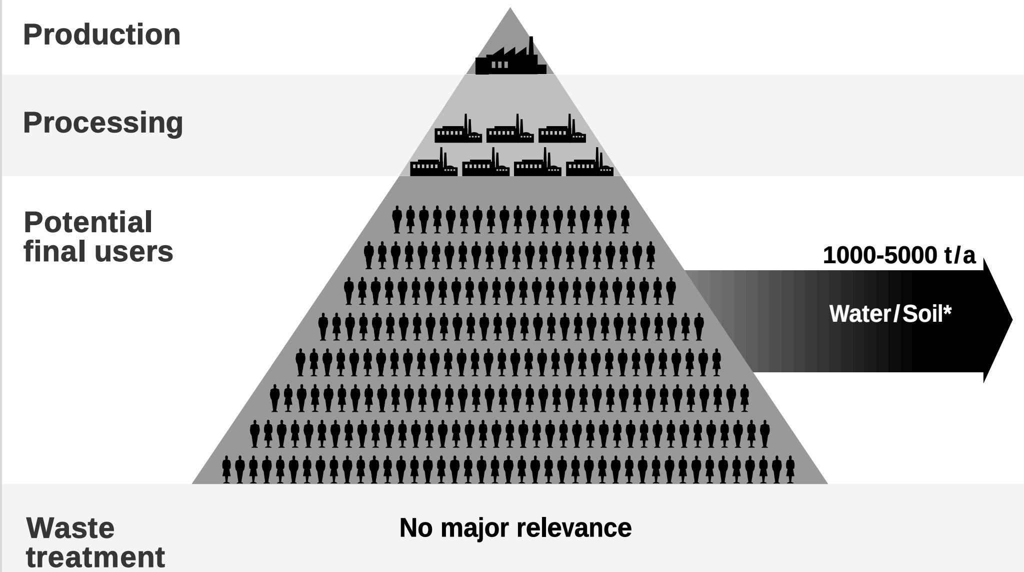
Risk-Profile



** Musk xylole with very high concern*

*** absorption through skin from cosmetic products*

Product Life-Cycle | **Producers and users**



** 90% of this soil via sewage sludge*
Mineralization in water treatment plants and resorption through skin not taken into account

3.6 Dichloraniline (DCA)

Dichloraniline is a synthetic organic chemical which among other uses is used as a base chemical in producing herbicides, algicides (diuron and linuron) and bactericides (trichlorocarbanilides, TCCA). The volumes processed into such active substances is about 4,000-5,000 tonnes per year; the market volume of diuron was about 3,000 t in 1995. There are about four to six manufacturers in the EU.

Diuron is applied as a herbicide on transport routes and in agriculture (cultivating asparagus, fruit trees, corn, grassland). It is also an important component in antifouling paints. TCCA is used as a bactericide in soaps and cosmetics.

Diuron and TCCA biodegrade in the environment into dichloraniline. Diuron and dichloraniline have a number of problematic characteristics. Under environmental conditions in water and sediments they only slowly degrade. DCA in addition tends to moderately bioaccumulate in particular in benthic organisms. Because of being used in the open environment in large amounts diuron and dichloraniline are found in concentrations of 0.1-1µg/l. in almost all rivers and coastal waters.

Diuron is particularly toxic to aqueous plants and algae. DCA has a hormone-like effect on fish and is chronically harmful to algae, fish, daphnia and worms. Sediment-feeding organisms and birds are regarded as critically exposed to DCA via the food chain.

The number of potential industrial users of diuron and TCCA is estimated at about a thousand, with the manufacturers of herbicidal products themselves being a relatively small group among these. The number of potential end-users is effectively identical to the population, public administrations and number of farmers in the EU.

The complete market volume of diuron is released directly into the environment (air, water, soils). The proportion of TCCA (or the DCA formed from TCCA) directly released is smaller because part of it is retained in sewage sludge.

Dichloranilin-Pesticides out of control

*Production development stagnating/downward trend

4.670 t/a*

**1995

3000 t/a**

*DCA for further processing in the EU

98 % Diuron, Linuron
2 % Trichlorcaranilide

Production volume EU	Market volume EU
4.670 t/a*	3000 t/a**

3,4 Dichloranilin

Building block and metabolite of Diuron, Linuron, Trichlorocarbanilide

Herbicide, algicide; bactericide

Environment 100%
Decomposition in water to Dichloranilin(DCA)

Fate

after end of service-life in percent of market volume

Critically exposed:

Producers

Bayer AG, D (Dichloranilin, Diuron; Notification of Diuron for EU assessment);
Aventis/Bayer; F (Diuron);
Industry Prodotti Chimici SpA, I (Linuron);
Makhteshim Agan International, B
(Notification of Diuron for EU assessment)

Some producers may have changed their names or their business.
Information sources on producers in data annex 1

Most relevant uses

(Only Diuron und TCC)

Antifouling* in paints, sealing products

Herbicide* Agriculture, traffic areas

Bactericide* in soap and cosmetics

*herbes, bacteria, alge

Risk-Profile

concern | high concern | very high concern

Substance properties

- Biodegradation in water
- Liability to bioaccumulate
- Toxicity to water organisms
- Carcinogen*, endocrine disruption**

** applicable for Diuron ** applicable for 3,4 Dichloranilin and fish species*

Exposure

- Measured concentration in fresh water
- Concentration in sediments
- Concentration in organisms, food chain !*
- Concentration in breast milk or blood

!* *= relevant lack of data*

Product Life-Cycle	Releases to the environment
Production	1-5 t/a
Processing	
Potential final users, potential users in agricultur	1000-5000 t/a — Soil/Water/Air — *Herbicide Diuron on sealed paths and squares; Herbicide Diuron in agriculture (releases to soils); Antifouling paints; Bactericide TCCA in soaps and cosmetics*
Waste treatment	No major relevance

3.7 Trifluralin

Trifluralin is a synthetic organic chemical, the market volume of which is about 3,000 tonnes per year. It is produced in one or two production sites in the EU.

In Europe, trifluralin is largely used as a herbicide in growing rape.

Under environmental conditions trifluralin only slowly degrades in water and sediments. In addition it tends to bioaccumulate in aquatic organisms that it may possibly biomagnify in the food chain. Due to its open use in large amounts trifluralin is often found in rivers in high concentrations (> 1 µg/l).

Trifluralin is very toxic to fish. In assessing the environmental risk, important information is lacking because there is no risk assessment yet for this pesticide at EU level.

There may be some 10 companies using trifluralin in their pesticide products. The number of potential end-users is effectively identical to the number of farmers in the EU.

The complete market volume of trifluralin is released directly into the environment (air, water, soils).

Trifluralin out of control

Production volume EU: ?

Market volume EU: 3200 t/a

No more registration/license in Sweden, Denmark and the Netherlands (January 2001)

Trifluralin

Selective herbicide

Environment 100%

Fate after end of service-life in percent of market volume

Critically exposed:

Producers

Dow Agro Science, UK (Production and notification for EU assessment);
Manerbio Finchimica, I (Production);
Makhteshim Agan Internat, B (Notification for EU assessment)

Some producers may have changed their names or their business. Information sources on producers in data annex 1

Most relevant uses

Herbicide Agriculture in particular raps

Risk-Profile

concern | high concern | very high concern

Substance properties

- Biodegradation in water
- Liability to bioaccumulate
- Toxicity to water organisms
- Carcinogen, toxic to reproduction

Exposure

- Measured concentration in fresh water
- Concentration in sediments !*
- Concentration in organisms, food chain !*
- Concentration in breast milk or blood !*

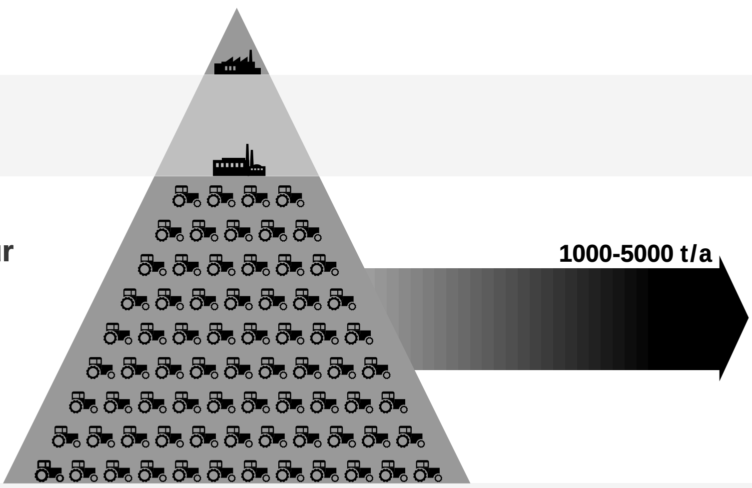
!* = *relevant lack of data*

Product Life-Cycle | Releases to the environment

Production

Processing

Potential users in agricultur



Waste treatment — No major relevance

Stand: 3/2003 © GREENPEACE

3.8 Dicofol

Dicofol is a synthetic organic chemical with a market volume of about 300 tonnes per year in the EU. It is produced by one or two European companies. Its production volume of 2,000 tonnes per year is much higher, indicating extensive exports.

Dicofol is used mainly in southern Europe as an acaricide in growing fruit and vegetables.

Dicofol has a number of problematic characteristics. Under environmental conditions it is persistent in water and sediments and can also be transported over long distances. In addition dicofol tends to bioaccumulate in the body fat of aquatic organisms and may biomagnify in the food chain. Being used in relatively small amounts, the environmental concentration of dicofol is usually well below 0.1 µg/l, but there is very little data from measurements. Its concentrations in organisms suggest that it may accumulate in the food chain; this is more likely via soils than via water. Dicofol is regularly among the most frequently found pesticides reported in the annual EU-wide pesticide residue monitoring programs (DG SANCO, 1998-2002).

Dicofol is very toxic to fish and damaging to birds' reproduction. There is a lack of relevant information because there is no risk assessment yet for this pesticide provided at EU level.

Some dozens of companies may use dicofol in their products . The number of potential end-users is effectively identical to the number of farmers in the EU.

The complete market volume of dicofol is released directly into the environment (air, water, soils).

Dicofol out of control

2100 t/a

Production volume EU

*No more registration/license in the nordic states, Germany and the Netherlands (January 2001)

300 t/a*

Market volume EU

Dicofol (Kelthane new)

Contact acaricide

Environment 100%

Fate after end of service life **in percent** of market volume

Critically exposed:

Producers

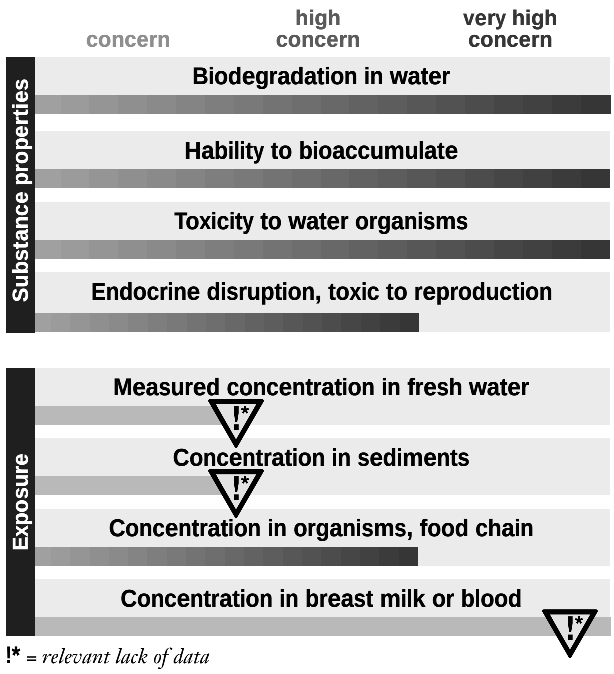
Rohm & Haas, I
(Production and Notification for EU assessment);
Montecina, E;
Makhteshin Agan, B
(Notification for EU assessment)

Some producers may have changed their names or their business. Information sources on producers in data annex 1

Most relevant uses

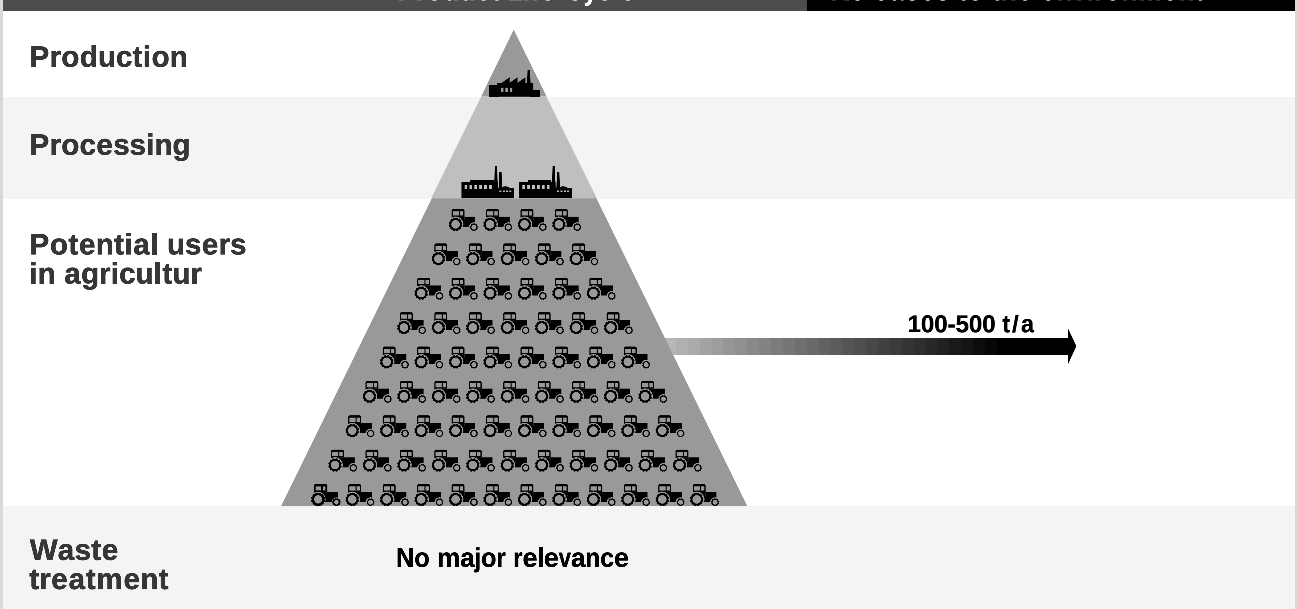
Acaricide*: agriculture
*agent against mite

Risk-Profile



!* = *relevant lack of data*

Product Life-Cycle | **Releases to the environment**



3.9 Organotin compounds: tributyl tin (TBT) and triphenyl tin (TPT)

Organotin compounds are a relatively broad group of metallo-organic chemicals whose properties have very diverse profiles. In the EU, the production volume of tributyl tin and triphenyl tin, which are the especially toxic components, was about 3,000-4,000 t/a at the end of the nineties; their production appears to be on the decline. The European market volume was around 2,000 t/a. The number of manufactures in the EU is about six to nine.

The main areas of use of this group of organotin compounds are antifouling paints, fungicides (grapes and potatoes), various biocide uses in preparations and products, and as catalysts in organic syntheses (including plastics). Tributyl tin is also an unintended impurity in plastic additives (e.g. in PVC products). Due to its use as a catalyst and due the use of dibutyltin (including TBT impurities) as a stabiliser TBT has been detected in several consumer products in recent years (see list of consumer products tested by *ÖKOTEST* in chapter B 2.2).

TBT and TPT have a number of problematic characteristics. Under environmental conditions their biodegradation in water and sediments is very slow. In addition they tend to concentrate in certain organs of aquatic organisms (the liver, for example). Being used in the open environment, organotin compounds are found in almost all rivers, especially along shipping routes. Their concentration in water is now relatively low (less than 0.1 µg/l) on account of the decline in amounts used, but sediments are still heavily polluted.

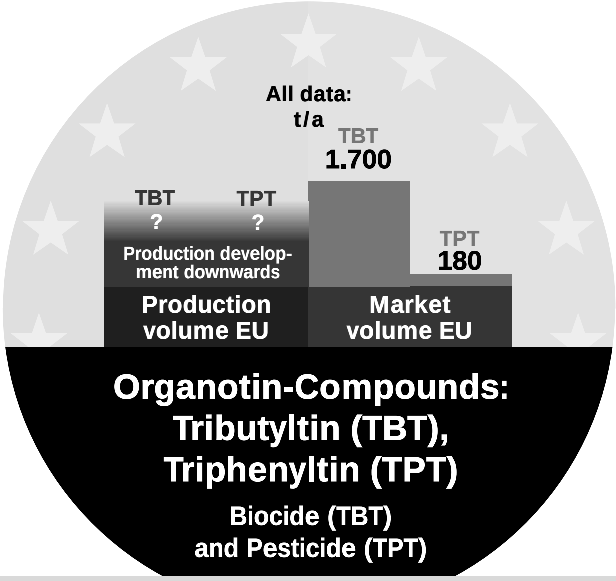
Particularly noticeable is their heavy accumulation in the livers of fish, birds and marine mammals.

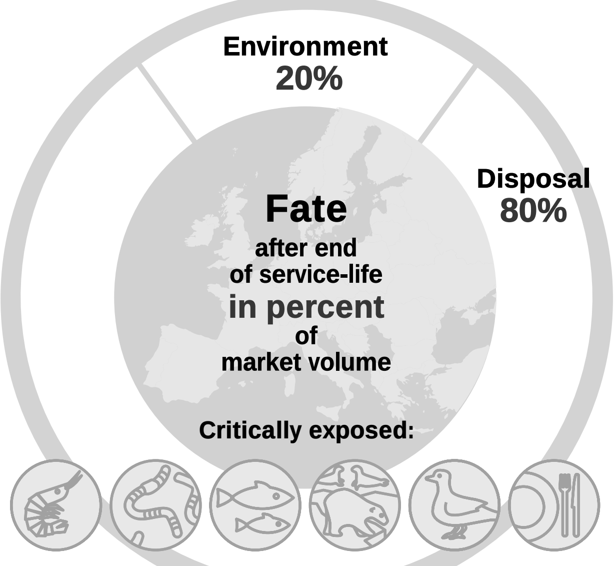
TBT and TPT are very toxic to aquatic organisms. Hormone-like effects on molluscs and fish which lead to severe reproductive disorders have been detected. In experiments with rodents immune disorders occur at very low doses. Environmental pollution with TBT does pose a risk on all routes of exposure.

The number of potential industrial users (directly or indirectly) of material containing TBT is estimated at several tens of thousands because TBT can always occur as an impurity in plastics and plastic additives. The number of potential end-users coming into contact with TBT is effectively identical to the population . With regard to chemical products (e.g. paints), however, the number of companies actually using TBT has become very small now since the use of TBT in antifouling paints will be totally phased out under the IMO Convention during the coming years.

Roughly calculated, the share of TBT and TPT directly or indirectly released into the environment (air, water and soils) is about 20 per cent of their market volume. The remainder is disposed of as waste in the form of products, construction waste or industrial waste (e.g. in form of ship's paints which have been removed).

Organotin-Compounds out of control





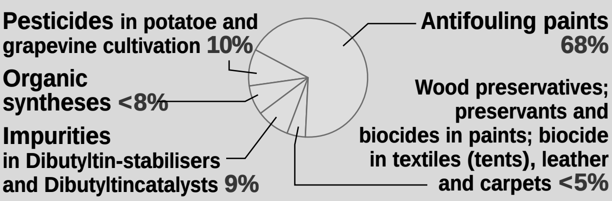
Producers

Cromton, D (Production of intermediates, biocides, pestizides, catalysts and stabilizers); **Reagens,** I (Production of catalysts, stabilizers); **Atofina,** NL (Production of biocides, pestizides, catalysts and stabilizers); **BNT,** D (Production of intermediates); **Rohm & Haas,** CH (Production of biocides and pestizides); **Aventis,** D (Production or import of Cyhexatin, Fentin); **OXON Italia,** I (Notification of Cyhexatin for EU assessment) **BASF,** D (Notification of Fenbutatin for EU assessment); **ELF Atochem Agri,** NL (Notification of Fenbutatin and Cyhexatin for EU assessment)

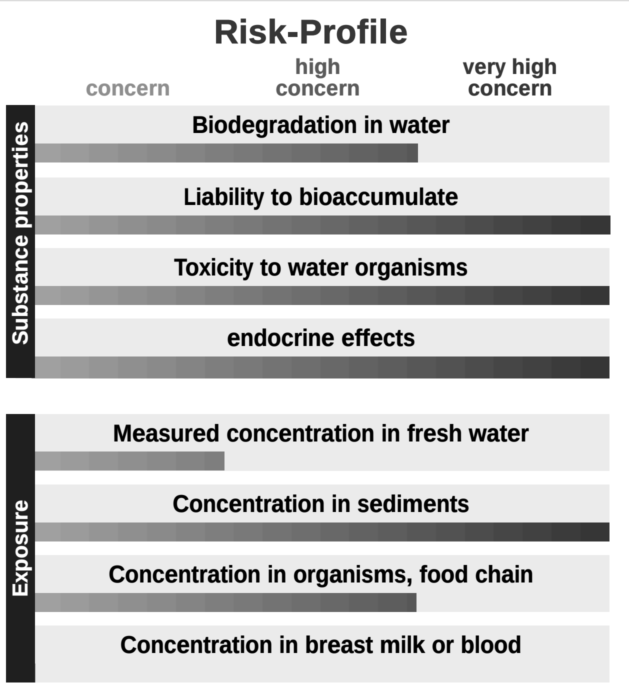
Some producers may have changed their names or their business. Information sources on producers in data annex 1

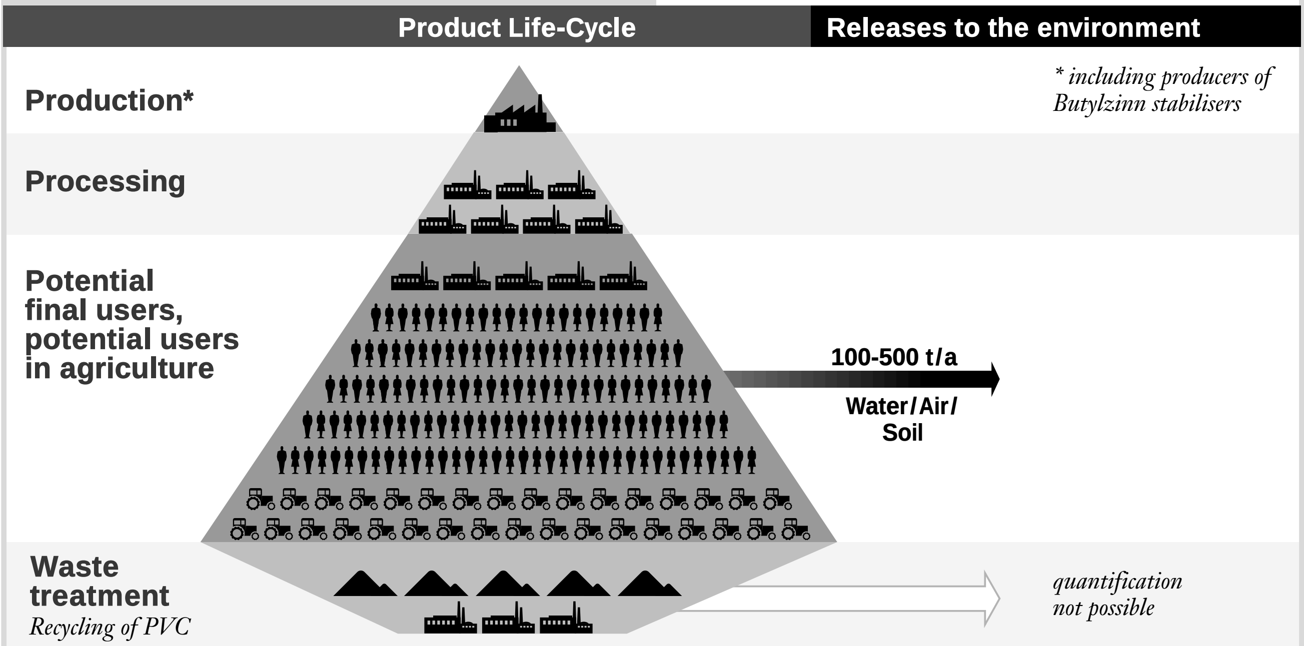
Most relevant uses

In % market volume



Risk-Profile





3.10 Cadmium

Cadmium is a natural metal with a market volume in the EU of about 2,600 tonnes. There are nine manufacturers in Europe, and production volume in the EU is roughly double the market volume.

Cadmium is mainly used in batteries, pigments, PVC stabilisers, in treating metal surfaces, and in alloys.

Cadmium has a number of problematic characteristics. As a metal, it is persistent and can be transported over long distances. Its mean concentration in water sediments (1-10 mg/kg dw) and river water (0.1-1 µg/l) in Europe today is about ten times the natural background concentration. In addition, Cadmium tends to accumulate in certain tissues.

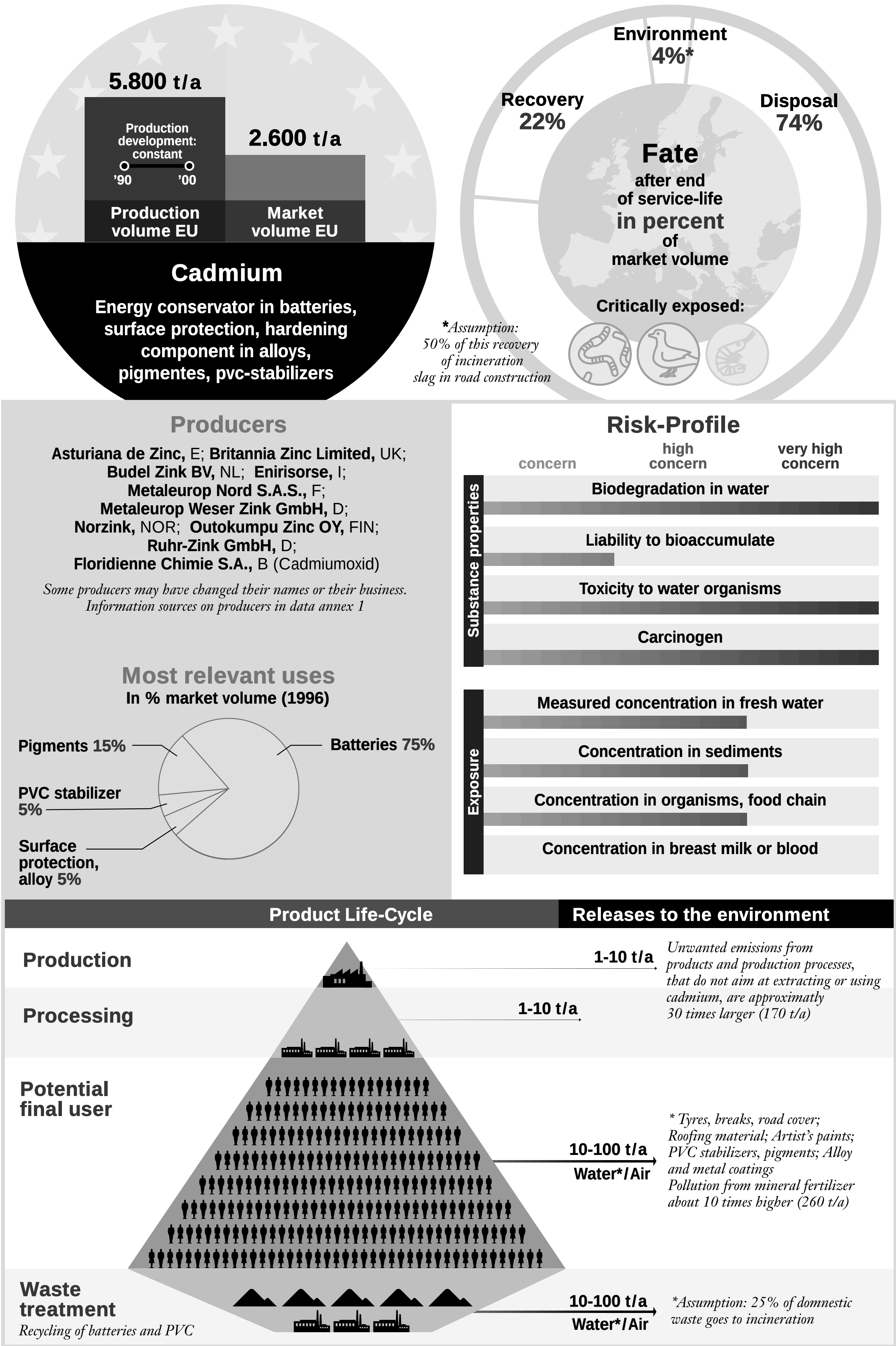
Cadmium is carcinogenic in most of its salts (cadmium oxide only as dust) and has a high systemic toxicity (e.g. kidneys). When dissolved, it is highly toxic to aquatic organisms, and cadmium ranks high among priority pollutants in European rivers.

The number of companies in the EU directly processing cadmium compounds into products and/or articles may be still over 100. Being widely used in electrical appliances, plastics and paints, the number of companies using preparations and products which potentially contain cadmium must be still very high. The number of potential final consumers is effectively identical to the population of the EU.

After the end of their service life, articles containing cadmium are disposed of as waste with household waste, electronic scrap, used vehicles or construction waste. Here again, many thousands of disposal companies in Europe are involved. Furthermore, cars and electric and electronic articles are recovered and recycled separately.

Roughly calculated, up to two per cent of the market volume per year is released into the air and water, with about the same proportion coming from its production, use of products and waste disposal. About 68 per cent ends up at waste disposal sites and about 13 per cent of marketed cadmium is recycled. The rest enters the ground as a contaminant in waste incineration slag utilised for construction works. However, the biggest proportion of emissions arises in the unintentional release of cadmium from products and processes where it is an impurity e.g. in artificial fertiliser and zinc, and in incineration processes and smelters.

Cadmium out of control



Stand: 3/2003 © GREENPEACE

Appendix

B Appendix B1 - Producers

1.0 Producers of substances

Chemical substances are usually produced by one to five companies in Europe, depending on market volume. In addition there may be several companies only importing the substances. The names of producers and importers of substances with a marketed volume > 10/t per year can in principal be identified on the European data base on existing substances (IUCLID) via the European Chemicals Bureau (http://ecb.jrc.it). However, since the updating of this data base obviously does not sufficiently work, additional information is needed in more than half of the investigated cases. Also, it is not possible to clearly separate producers and importers in the publicly accessible data base.

In the following list of producers, the information sources are indicated for each substances. Nevertheless, this information may need further updating or corrections. In some cases importers may also be included in the list.

1.1 DEHP Producers (Draft RAR, May 2001, (ceased productions removed)

Company	Location	Source
BASF AG	Ludwigshafen, Germany	List of companies as contained in the Draft EU Risk Assessment Report on DEHP, 2001; ceased production removed as far as indicated in the table.
BASF, Espanola	Tarragona, Spain	
BP Chemicals	Hull, UK	
Celanese[1]	Oberhausen, Germany	
Driftal GPD	Lisbon, Portugal	
Elf Atochem Fr	Chauny, France	
Industrie Generali SpA,	Samarante, Italy	
Lonza [3]	San Giovani, Valdarno, Italy	
Neste Oxo	Stenungsund, Sweden	
Neste Oy	Porvoo, Finland	
Oxeno Olefinchemie[2]	Marl, Germany	
Plastificantes de Lutxana (PDL)	Baracaldo, Spain	
SISAS Pantochim	Feluy, Belgium	
SISAS[4]	Ostend, Belgium	

[1] name changed from Hoechst AG in 1997
[2] name changed from Hüls AG in 1997
[3] name changed from Alusuisse in 1994
[4] name changed from UCB in 1995
[5] Lonza is carrying on production of DEHP at the Enichem plant at Porto Marghera
[6] Sintetica SpA is now the SISAS plant at Piotello

DEHP in product brands

Use in a multitude of products; are exchanged for other plasticisers in parts of the market; no significant data available. A selection of products can be seen in appendix B2.

1.2 Producers of brominated flame retardants (Draft EU RAs on HBCD, DECA and TBBA, UBA 2001)

Firma	**Ort**	**Sources**
Broomchemie/Dead Sea Bromine Group (HBCD)	Terneuzen (NL)	Based on information in various sources as listed above
Great Lakes Manufacturing (UK) (Ltd.) (HBCD)	Newton Aycliffe, Co.Durham (UK)	

Brominated flame retardants in product brands

Use in a multitude of products; are exchanged for other types of flame retardant agents (in electronic devices, furniture, cars) in parts of the market; significant data on products still containing brominated flame retardants not available.

1.3 Producers of chlorinated Paraffins (Eurochlor, 2002)*

Firma	Ort	Source
Ineos Chlor Ltd[1)] (SCCP, MCCP, LCCP)	Runcorn, Cheshire (UK) Chocques (F) ?	Industry information seems to be the most updated
Caffaro S.p.A (SCCP, MCCP, LCCP)	Mailand (It)	
Leuna Tenside (MCCP, LCCP)	Leuna (D)	
Quimica del Cinca S.A. (MCCP)	Barcelona (S)	

* List of EURO CHLOR Chlorinated Paraffin Producers and Contacts, updated 28.03.02; pers.com.

1) previously ICI

Chlorinated paraffins in product brands

Use in a multitude of plastic products; significant data not available. Substitution of short-chain chlorinated paraffins with medium-chain chlorinated paraffins or other chemicals in metal processing fluids ongoing.

1.4 Producers of nonylphenol (UBA 2002)*

Firma	**Ort**	**Source**
Sasol GmbH[1)]	Marl (D)	Industry sources seem to be the most updated
Enichem S.P.A	Milano (It)	

* Producers of Nonylphenolethoxilates in Western Europe 1996/1997 (Boehm et al, 2002;)

[1)] previously Hüls AG

Nonylphenolethoxylates in product brands

Use in a multitude of technical products for industrial or institutional sphere. In broad sections of the market substitution by tensides which are better degradable; significant data not available.

1.5 Manufacturers and importers of musk compounds (IUCLID 2002)*

Firma	**Ort**	**Source**
Bush Boake Allen LTD (HHCB, AHTN)	London (UK)	
Haarmann & Reimer (HHCB)	Holzminden (D)	
International Flavours and Fragrance (HHCB)	Haverhill, Suffolk (Uk) Drogheda (IRE) Tilburg (NL)	
Firmenich & Cie (HHCB)	Neuilly sur Seine (Fr)	
Quest International (HHBC)	Ashford, Kent (UK)	
Givaudan (HHCB und AHTN)	Vernier (CH)	*Webpage*

* IUCLID 2002, some of the companies may be importers only

Musk in product brands

Use in a multitude of cosmetic products and soaps; musk xylol und musk toluol have been replaced by polycyclic musk compounds or other fragrance during the last eight years. The process of substitution is continuing. Significant data on the use of musk compounds in particular products are not available. A selection of cosmetics in which musk compounds have been detected in the last few years is listed in appendix B2

1.6 Producers of dichloraniline, linuron, diuron, trichlorcarbanilide (EU Draft RAR on 3,4 Dichloraniline 2001, IUCLID 2002, DG SANCO 2000)*

Firma	Ort	
Bayer AG (production of Dichloranilin, Diuron; notification of Diuron for EU evaluation)	Leverkusen (D)	2000+ 2002#
Aventis Cropscience/Bayer Environmental Science (Diuron)[1)]	Lyon (F)	2002# webpage
Industria Prodotti Chimici SpA (Linuron)	Mailand (It)	2002# webpage
Makhteshim Agan International (notification of Diuron for EU evaluation)	Brüssel (B)	2000+

IUCLID 2002, + DG SANCO: List of active substances and notifyers for which a notification has been submitted (Second List of Existing Active Substances) (October 2000)

1) previously Rhône-Poulenc and Hoechst and Hoechst Schering Agrevo; in 2003 BAYER;

Diuron pesticides licensed in Germany (BBA 2001)

Company	Location	Product	Use
Bayer Vital	Leverkusen	Ustinex G N	Herbicide for pomaceous fruit and grapevines; paths and spaces with woody plants (e.g. tree nurseries), non-cropland, traffic areas Licences expire 2004–2008
		Rapir	
		Rapir WG	
		Diuron Bayer	
Spiess-Urania	Hamburg	Cumatol	
		Vorox	
Stähler Agrochemie	Stade	Adimitrol WG	
Microsol Handels GmbH	Neumünster	Unkraut Ex	
Hentschke und Sawatzki KG	Neumünster	RA 15	
Vetyl-Chemie GmbH	Illingen	Vety-Unkraut frei	
Chemical Fabrik Bruno Vogelmann	Crailsheim	Tuta-Super	

1.7 Producers of trifluralin (IUCLID 2002, DG SANCO 2000)

Company	**Location**	**Source**
Dow Agro Science (manufacture and notification of trifluralin for EU evaluation)	Hitchin (UK)	2000+
Manerbio Finchimica (production of trifluralin)	Manerbio-Brescia (It)	2002#
Makhteshim Agan International (notification of trifluralin for EU evaluation)	Brussels	2000+

IUCLID 2002 + DG SANCO: List of active substances and notifiers for which a notification has been submitted (Second List of Existing active substances) (October 2000)

Authorised trifluralin pesticides in Germany (BBA 2001)

Company	**Location**	**Product**	**Use**
Dow Agro Science GmbH	Munich	Treflan	herbicide for cabbage, carrots, rape, winter corn, sunflowers Licences expire 2005–2006.
		Elancolan	
Stähler Agrochemie	Stade	Demeril 480 EC	
Feinchemie Schwebda	Eschwege	Mamba	
		Scirocco	
United Phosphorous Ltd.	Warrington, Cheshire (UK)	Devrinol Kombi CS	
Makhteshim Agan Deutschland	St. Augustin	Triflurex	
Industry Prodotti Chimichi SpA	Novate Milanese (It)	Ipifluor	

1.8 Producers of dicofol (OSPAR 2001, DG SANCO 2002)

Company	Location	
Rohm & Haas: production of Dicofol, notification for EU evaluation	Cessate, Milan (It)	2000*
Montecina: production of dicofol	Barcelona (S)	2000*
Makhteshin Agan: notification for EU evaluation	Brussels (B)	2001+

* OSPAR 2001 + DG SANCO 2342/2001 rev.2 – List of active substances and notifiers for which notification has been assessed and appears to be admissible (21.6.2001) (Third List of Existing EU active substances)

1.9 Producers of organotin compounds (RPA 2002)*

Company	Ort	Source
Crompton (production of intermediates, biocides, pesticides, catalysts, stabilisers)[1)]	Bergkamen (D)	2002* 2002 #
Reagens (production of catalysts, stabilisers)	IT	2002*
Atofina (production of biocides, pesticides, catalysts, stabilisers)	NL ?	2002*
BNT (production of intermediates)	Bitterfeld (D)	2002*
Rohm & Haas (production of biocides and pesticides)	Ch	2002*
Aventis Deutschland (roduction or import of cyhexatin and Fentin) [2)]	D	2002#
Oxon Italya (notification of cyhexatin for EU evaluation)	Mailand (It)	2000+
BASF (notification of fenbutatin for EU evaluation)	Ludwigshafen (D)	2001+
Elf Atochem Agri (notification of fenbutatin and cyhexatin for EU evaluation)	Vlissingen (NL)	2001+, 2002# webpage

[1)] previously Witco [2)] previously Agrevo, formed by Schering and Hoechst

* Risk and Policy Analysts (RPA); Assessment of the risk to health and the environment posed by the use of organostannic compounds (excluding use as biocide in antifouling paints) and a description of the economic profile of the industry; Final Report for the European Commission (DG Enterprise), 2002

\+ DG SANCO 2342/2001 rev.2 – List of active substances and notifiers for which notification has been assessed and appears to be admissible (21.6.2001) (Third List of Existing EU active substances)

\# IUCLID 2002

Authorised organotin pesticides in Germany (BBA 2001)

Company	Location	Product	Use
BASF	Ludwigshafen	Torque (50% fenbutatin oxide)	Acaricide used against spider mites in strawberries, ornamental plants, wine (licensed until 2004)
Aventis Crop Science GmbH	Munich	Brestan flüssig 50% fentin hydroxide	Fungicide used against tuber rot (licensed till 2003, licence repealed August 01)

Organo tin compounds in product brands

Organotin compounds are found in numerous textile and plastic products. A systematic overview is not available. A selection of brand-name articles containing organotin compounds are listed in appendix B2.

1.10 Producers of cadmium (DRAFT RAR 2002)

Company (and plant)	Country	Source
Asturiana de Zinc	Spain	List of companies as contained in the Draft EU Risk Assessment Report on Cadmium, 2002; ceased production removed as far as indicated in the table.
Britannia Zinc Limited	Avonmouth (UK)	
Budel Zink BV	Netherlands	
Enirisorse	Italy	
Metaleurop Nord S.A.S.	France	
Metaleurop Weser Zink GmbH	Germany	
Norzink	Norway	
Outokumpu Zinc OY	Finland	
Ruhr-Zink GmbH	Germany	
Floridienne Chimie S. A., (Cadmiumoxid)	Belgium	

Appendix B 2 - Hazardous substances in finished products and cosmetics

Apart from just a few exceptions the use of hazardous substances in non-chemical products such as construction materials, furniture, electronic appliances, cars, shoes or sportswear, are not subject to any official controls in the EU. Only for children's toys and food packaging are requirements somewhat stricter, but these have not been able to prevent children's toys containing plasticisers toxic to reproduction from being marketed for decades. Much the same applies to cosmetics. In spite of specific legislation, environmentally hazardous substances such as long-life, bioaccumulative, toxic musk compounds, keep appearing in cosmetics.

Due to the loopholes in legal requirements hardly any information is publicly available on the content of hazardous substances in everyday non-chemical products and cosmetics. Only in consumer magazines like *Test* or *ÖkoTest* are the findings of targeted chemical analysis regularly published. The following section gives an overview of product groups and brands in which one of ten hazardous substances selected as examples was found in the last four (product groups) / ten (brands) years.

2.1 *ÖkoTest* survey

The substances of interest were searched for in a full text search in *ÖkoTest*'s publications in the years 1992 to 2002, with the following results:

- plasticisers/phthalates 123 hits
- brominated flame retardants 66 hits
- chlorinated paraffins 0 hits
- nonylphenol 0 hits
- tenside 70 hits
- musk compounds 71 hits
- diuron 0 hits
- trifluralin 0 hits
- dicofol 1 hits
- pesticides 141 hits
- organotin 80 hits (57 TBT/TPT and 23 DBT)
- cadmium 92 hits

In a second step, product groups in which the substances concerned had been detected were selected. Here, however, the individual substances could not always be identified, or their concentrations determined, from the texts electronically available.

New analyses are being incorporated for musk compounds because a substitution process has manifestly been taking place since the mid-1990s and the findings of the tests involving these compounds may no longer be valid today.

Few test results are available for brominated flame retardants in the mid-1990s. The major part of the hits in the full text search is due to brominated flame retardants being mentioned in the accompanying text.

No electronic assessment was possible for nonylphenol compounds or specific pesticides.

ÖKOTEST product list

Product	Brand	Substance	Concentration	Year
Plaster	**Aluderm Aluplast Kinderpflaster;, SÖHNGEN (Taunusstein)**	Phthalat	190 to 1790 mg/kg	1999/2000
	Cerotti Sanifarm, A.T.A.CHIMICIA (Penny) (Carnonara al Ticino)			
	Cosmoplast Strips und Cosmos Wundpflaster, HARTMANN (Heidenheim)			
	Pflastine, D'APOTE (Wuppertal)			
	Pharmadoct Wundschnellverband, EUROSIREL (Settimo Milanese)			
	Alma med Kinderpflege mit Überraschungen, ALMA (München)			
	Kuraplast Kids, LOHMAN (Neuwied)			
Paddling Pool	**15 products testet**			July 2002
	Blue Shark Planschbecken	DBT in 12 products	25 to 5720 µg/kg	
	The Wet Set Sprüher Pool Puppy			
	Wehnke Baby-Planschbecken Lovely Teddy Bears	TBT in 6 products	25 to 87,3 µg/kg	
	Wehnke Planschbecken Friends, Best.-Nr.: 274.518			
	Wehnke Spiel-Pool "Happy Kids", Best. 6879025	Other organotins in 5 products	250 to 3277 µg/kg	
	Sun & Sea Planschbecken, Best.4759351			
	Fix-Planschbecken Evolution Best.-Nr.: 5739 078			
	Jumbo-Pool, Best. 399 605 2	Phthalates in all products	53 to 110 g/kg	
	Planschbecken Best. 650-028			
	Planschbecken mit verzinktem Gestell, Best. 192-873			
	Summer Fun Minifant Junior-Pool			
	Sun & Sea Kinderplanschbecken mit Dach, Best. 05 88 527			
	Sun Games "Mini-Planschpool"			
	Weekend Giant-Planschbecken, Best. 2326034			
	Zapf Creation Clou-Pool			

Product	Brand	Substance	Concentration	Year
Baby Plastic Books	**11 Products tested**			
	Mein Badespaßbuch – Der kleine Marienkäfer, ARS EDITION (München)	Phthalates Cadmium Organotins	up to 23 % 9,6 mg/kg 402 µg/kg	
	Regenbogenfisch Badebuch von Nord-Süd-Verlag	Organotins	131 µg/kg	
	Planschi das Badewannenbuch, Pestalozzi-Verlag	Organotins	173 µg/kg	
	Der weiße Vogel, Ein Endlosbuch für die Badewanne, Moritz-Verlag	Phthalates	up to 23 %	
	Knautschi, der bunte, weiche Badespaß, Favorit-Verlag	Phthalates Cadmium	up to 24 % 12 mg/kg	
Child seats for Cars	**9 Products tested**			June 2001
	Bébé Confort Elios, Gr. 0+	Cadmium Flameretardants	Detectet	
	Synthesis Lux 0+	Cadmium Flameretardants	Detectet	
	Carry One 0+	Flameretardants	Detectet	
	Easy Bob Maxi			
	Prima 0+			
	Römer Baby-Safe 0			
	Römer Baby-Star 0+			
	Storchenmühle Space 0+ mit Basis-Fix-Gestell (Set)			
Swimsuit	30 Products tested			May 2002
	Rasurel Badeanzug Modell Globe Trotter	DBT	504 mg/kg	
	Ariella Modell Zenta von Univers-Textil	Phthalates	140 mg/kg	
	Sunflair Badeanzug Modell 22277	Phthalates	170 mg/kg	
	Infiinity Beach mit Flagge von Woolworth	DBT Phthalates	49,7 µg/kg 3784 mg/kg	
	Esprit Badeanzug M2053 Pop Art Swimsuit	DBT	3880 µg/kg	
	Anita Badeanzug Modell Masira	DBT	49,7 µg/kg	

Product	Brand	Substance	Concentration	Year
Cycling Shorts	**18 Products tested**			May 2002
	Adidas Cycling Raceshort	Phthalates	202 mg/kg	
	Assos Half Shorts	Phthalates	556 mg/kg	
	Bicycles Hose kurz mit Logo	DBT	587 µg/kg	
	Gonso Bike-Shorts	Other organotins DBT	991 µg/kg 304 µg/kg	
	Gore Bike Wear, Bike & More Leisure Short	DBT	132 µg/kg	
	Hind Pro Drylete Short	Phthalates	141 mg/kg	
	Jack Wolfskin Speed Short Unisex	DBT Other organotins	1700 µg/kg 575 µg/kg	
	Jeantex Fahrrad-Short, Modell Bari	DBT	107 µg/kg	
	Spark Rad-Hose Best.-Nr.: 9969941	Phthalates	322 mg/kg	
	Sportful Radhose kurz	Phthalates	437 mg /kg	
	SUGOi Neo Pro Short Unisex	DBT	26,7 µg/kg	
		Phthalates	155 mg/kg	
	TCM Profi-Rad-Hose	Phthalates	460 mg/kg	
Rainjackets for Kids	**16 Products tested** Abeko Regenanorak gelb/marine, Best.-Nr.: 223.395 (inzwischen ersetzt) Adidas S-Adiscape Y Anzoni Regenjacke Children´s Titex Regenjacke Formicula Regenanzug für Kinder Helly Hansen Hilton Rain Jacket Jako-O Regenjacke, Best.-Nr.: 590-637, Fb. 04 Jeantex Regenjacke Nelly K-Way Plus Kinder-Regenjacke Kidz Only Regen-Jacke Palomino Kinder-Regenjacke Prénatal Regenmantel (durchsichtig mit Blumen) Regenjacke + Rucksack, Best.-Nr.: 466/120 TCM Kinder-Regenjacke Tells Wetwear Regenjacke Mod. RJA350	TBT in all Jackets Other organotins in all jackets Phthalates in 4 jackets	25 to 120 µg/kg 25 to 50600 µg/kg Detectet	March 2002

Product	Brand	Substance	Concentration	Year
Karneval Masks	**6 Products tested:** Gerhard Schröder Kindermaske Laa-Laa Queen Elisabeth	Phthalates Other organotins TBT	up to 25 % of PVC Detectet Detectet	February 2001
	Michael Schumacher	Other organotins Phthalates TBT	22975 µg/kg 24 % of PVC 33,8 µg/kg	
Rainstrousers for Kids	**12 Products tested** Digger's Buddelhose Europwear Buddelhose H & M Regenhose Kids and Friends Buddelhose Oskar's Regenhose Palomino Ocean, Original Buddelhose Playshoes Matschhose Prénatal Regenhose Smily Matchhose Step In Kinder-Regenlatzhose TCM Kinder-Regenhose Tells Wetwear Matschhose	Phthalat in 8 trousers Other organotins in 5 trousers DBT in all trousers	45,7g to 223 g/kg 200 to 4203 µg/kg 25 bis 5060 µg/kg	March 2002
		Cadmium in Playshoes Matschhose u H&M Regenhose	25 to 38 mg/kg	
		TBT in Kids and Friends und in Step in.	25 to 54 µg/kg	

Product	Brand	Substance	Concentration	Year
Air Mattress	**13 produts tested** Fix & Foxi Jugendsurfer New Line Nylon-Sitz-Liegematratze Art.-Nr.: 0911607 Pan Toys Paradise-Surfer, Luftmatratze mit Fenster Royal Beach Solar-Liegematratze Splash Kiddy Mattress – Kindermatratze +/- 76 cm Strand-Set Delphin (Kinderm., Ball, Delphin) Art. Nr. 214669 Sun & Sea by Simex Sport Luftmatratze, Art. 0911579 Sun & Sea Liegemat. 2er-Set PVC transparent, Best. 9481686 The Wet Set Luftmatratze Tote-N-Float #58807 Wehncke Spiel & Sport Matratze, Art. 13145 Wehncke Spiel & Sport Nizza Box-Matratze Pop, Art. 13246 Wehncke Spiel & Sport Sitz-Liegematratze Nylon, Art.13006 Zapf Creation Luftmatratze	TBT in 4 mattresses Phthalat in all products Other organotins in all products Cadmium in Spash Kiddy und Wehncke Spiel & Sport	Detectet 65 to 150 g/kg 250 to 2790 µg/kg 0,12 to 0,34 mg/kg	June 2001
Sleepingbags	**20 produts tested** Ajungilak New Igloo 180 R CZ, blau Big Pack - Dreamer 190 Bundeswehrschlafsack Feuchter, Ringelai Q/B21F/X0094/X0661 Four Seasons Yosemite 180, navy/cobalt R Globus Big Box Mumienschlafsack Haglöfs - Outback # 10 High Peak Mumienschlafsack Redwood, koppelbar Isle of Kodiak - Sund 180 Jack Wolfskin Regular Cheyenne, Basic Navy Lestra Mini Light Mumienschlafsack Mountain Equipment Firewalker I NONOSE 1Kg Bag Mumienschlafsack Nordisk High Point, grün/schiefer R 185cm Our Planet Kunstfaserschlafsack Otago, long S.A.M. Polar Lite Schlafsack Easy Pak 1000, Best.-Nr.: 424.854-8 Schlafsack RW 300 Schlafsack Sevilla/Madrid, Best.-Nr. 8388/068 Vaude Travel Compact 225 Wehncke Outdoor PSL Grafik, Best.-Nr.: 798227	TBT in 4 products Flame retardants in 3 products Phthalates in 7 products Other organotins	Detected Detected 1000 to 2655 g/kg 250 to 3336 µg/kg	June 2002

Product	Brand	Substance	Concentration	Year
Garden Hose	ADW Gartenschlauch-Set Standard, TOOM-BAUMARKT	TBT	0,16 to 0,74 mg/kg	March 2000
	Garditech Qualitäts-Gewebe Wasserschlauch, IK-KUNSTST.- TECHNIK			
	Gardol Classix Gewebe-Wasserschlauch, BAUHAUS	Other organotins	0,7 to 13,9 mg/kg	
	Gigant Garten-Wasserschlauch, PETERSEN			
	LaquaTec Flexi Ver Wasserschlauch, LAQUATEC	Cadmium	Nd to 290 mg/kg	
	Meister-Gruppe Qualitätswasserschlauch, MEISTER-GRUPPE			
	Schlauchgarnitur komplett mit 4 tlg. Armaturenset, TOOM-BAUMARKT			
	Verstärkter Gartenschlauch, BAUHAUS			
Rubber Boots	Stiefel mit Janosch Motiv, BEST OF SHOES (Essen)	TBT	0,001- 0,008 mg/kg	October 2000
	Polomino Gummistiefel, C&A (Düsseldorf)	Lead	100 – 3500 mg/kg	
	Captains Rubber Boot, SCHUH HESS (Hamburg) *			
	G. Nass Gummistiefel marine, BABY WALZ (Bad Waldsee)	Other organotins	0,13 – 2,4 mg/kg	
	Kidz Only Gummistiefel, KAUFHOF (Köln)			
	Teddy Shoes Gummistiefel, WAL-MART (Wuppertal)			
	Cortina Gummistiefel, DEICHMANN (Essen)	Cadmium	Nn – 300 mg/kg *	
	Jela Gummistiefel, Model Max, JELA (Klecve)			
	Weather Friends, KARSTADT			
Patent-Leather Boots	**13 Products tested** Ara Lackstiefel Donna Christina Lackstiefel, Best.Nr. 0240/966, Fb. 01 Esprit Kristie H.Boot 410366 Jean Pascale Lackstiefel Precious SM. Lackstiefel Hot-Spot, Best.Nr.: 9231830 Lackstiefel Modelo 264 374 Lackstiefel, 1603.239.01 Marco Donati Lackstiefel Prentiss Lackstiefel Taxi Lackstiefel Viala Lackstiefel Wolf Lackstiefel	TBT Other organotins	25 to 90 µg/kg 250 to 9942 µg/kg	December 2001

Product	Brand	Substance	Concentration	Year
PVC Flooring	Bocato Presto Selbstkl. Bodenfliesen, Damier Saphier, BOCATO (Troisdorf)			May 2000
	CV-Bodenbelag Clever Marmor-Design, BAUHAUS (Mannheim)			
	CV-Bodenbelag Colors, BAUHAUS (Mannheim)			
	CV-Bodenbelag Faro, Design Kuhflecken, TEPPICH FRICK (Burgwald)	Phthalates	10 to 82 g/kg	
	CV-Bodenbelag Franzin Schachbrett s/w,, TEPPICH FRICK (Burgwald)			
	CV-Bodenbelag Sopo Holz, Art.-Nr.: 79041, TARKETT (Frankenthal)			
	Fantasy Art.-Nr.: 3822100, Rauten blau/weiß marmoriert HORNBACH (Bornheim)	TBT	0,01 to 3,5 mg/kg	
	Fantasy Art.-Nr.: 6061781, hellblau mit Glitter, TOOM-BAUMARKT (Köln)			
	Febolit Fayence – selbstklebende elastische Fliesen, FEBOLIT (Frankenthal)	Other organotins	1 to 32 mg/kg	
	Gerflor Color Selbstklebende Bodenfll, GERFLOR (Troisdorf)			
	Hornbach Fashion Selbstklebe-Fliesen Art.-Nr.: 0644644 HORNBACH (Bornheim)			
	PVC Alpha Madeire blau (Design: Steinboden), PRAKTIKER (Kirkel)			
	PVC Onyx Art.-Nr.: 27099, graumarmoriert, DEKOTEX TEPPICHBODENCENTRUM (Essen)			
	PVC rot mit Muster: gestanzte Kreise, SOMMER (Langenhagen)			
	PVC-Bodenbelag Pisa, Holzbodendesign, HORNBACH (Bornheim)			
	Trendy PVC-Belag Umbra, Design Fischgrat, SOMMER (Langenhagen)			

Product	Brand	Substance	Concentration	Year
Eye Cream	**26 Products tested** Mouson Aktiv-Liposome Augencreme von Jade Exquisit Augen creme von Hildegard Braukmann Sans Soucis Firming Eye Creme von Sans Soucis	Polycyclic musks	Detected	April 2001
Foam Bath	**26 Products tested** Aroma Pure Reinheit von Yves Rocher Enzborn Johanniskraut Ölschaumbad	Polycyclic musks	Detected	January 2002
	Litamin Wellness	Diethylphthalat		
Shower Gel	**29 products tested** Wellness Duschgel natural Balance von Florena Cosmetic	Diethylphthalat	Detected	September 2001
	Jardins du Monde, Frische-Duschgel von Yves Rocher Palmolive Naturals Duschgel Hydrating von Colgate-Palmolive	Polycyclic musks	Detected	
Eye-Make-Up-Remover	**28 products tested** Rival de Loop Augen Make Up Entferner	Polycyclic musks	Detected	May 2002
Hair wax	**22 products tested** Alpecin Gel Wax Balea Styling Gel extra stark Drei Wetter Taft Hair Wax Fructis Style Glossy Wax starker Halt FX Special Studio Line – Out Of Bed, Fiber Forming Creme FX Studio Line Cristal' Wax Shine-Effekte, ultra langer Halt Happy Hair Perfect Haar Wax Shine Extra Strong Karité-Haarcreme Kür Styling Wet Gel ultra stark Nivea Hair Care Styling Gel ultra starker Halt Poly Swing Modellier Wax Extra Strong Swiss o Par Kokos-Haarwachs Wella high Hair Solid Wax starker Halt	Nitromusks or polycyclic musks in 50% Diethylphthalat in 50%	Detected Detected	May 2002
	AS Styling Gel ultra strong	Diethylphthalat Nitromusks	Detected 2 to 10 mg/kg	

Product	Brand	Substance	Concentration	Year
Deodorants	**47 products tested**	Nitromusks or polycyclic musks	Detected	August 2000
	Impulse Parfum Deodorant Vanilla Kisses Spray, ELIDA FABERGÉ (Hamb)			
	Impulse Parfum Deodorant Vanilla Kisses Zerstäuber, ELIDA FABERGÉ			
	Bionsen Deodorant, MANN & SCHRÖDER (Siegelsbach)			
	Bionsen Sensitiv Spray 24h, MANN&SCHRÖDER (Siegelsbach)			
	Davidoff Cool Water Woman Spray, LANCASTER (Mainz)			
	Fenjal Creme Deo, Pump–Spray, JOHNSON&JOHNSON (Düsseldorf)			
	Fenjal Creme Deo, Spray, JOHNSON&JOHNSON (Düsseldorf)			
	Florena Deo Sensitive, Deospray, FLORENA (Waldheim)			
	Jil Sander Sun Deo, JIL SANDER (Mainz)			
	Joop! Berlin Mild Deo, LANCASTER (Mainz)			
	Naf Naf Deo Parfum, S.B.I. (Paris)			
	Obsession Deo, CALVIN KLEIN (Wiesbaden)			
	Rexona 24h Intensive Deo–Spray, ELIDA FABERGÉ (Hamburg)			
	Rexona 24 Intensive Deo Pump–Spray, ELIDA FABERGÉ (Hamburg)			
	Satina von Sanex Deo Spray, SARA LEE (Köln)			
	Satina von Sanex Deo Zerstäuber, SARA LEE (Köln)			
	Tommy Girl Deo Natural Spray, TOMMY HILFIGER (München)			
Soaps****	**36 products tested**	Nitromusks or polycyclic musks	Detectet	1999
	Cleopatra, COLGATE-PALMOLIVE			
	Hübner Pflanzenölseifen, HÜBNER REFORMHAUS			
	Montana, CLARINS			
	Roger&Gallet, YSL BEAUTE			
	Sante Reine Pflanzenöl Glycerinseifen, SANTE (Bioladen)			
	Yardley Luxury Soap, MUELHENS			
	Florena Cremeseife, FLORENA COSMETIC			
	Satina von Sanex Creme Seife, SARA LEE			
	Yves Rocher Transparent seife, YVES ROCHER			
	8x4 intensive, BEIERSDORF			
	Coco Luxury Bath Soap, CHANEL			
	Fa, SCHWARZKOPF			
	Kappus Transparente Fruchtseifen, KAPPUS			

Product	Brand	Substance	Concentration	Year
Barbie Dolls	Barbie Rainbow Princess, MATTEL (Dreieich)			December 2000
	Sylvia–Marie Life Style, SIMBA TOYS (Fürth)			
	Britney Spears, JOKER (CH–Kerzers)			
	Hawaii Ken, MATTEL (Dreieich)	Phthalates	Detectet	
	Jessica, TOYS“R“US (Köln)			
	Sailor Moon, IGEL (Carlow)			
	Shelly Club Lorena, MATTEL (Dreieich)	Organotins other than TBT	0,1 to 26 mg/kg	
	Steffi Love Skate „N“ Board, SIMBA TOYS (Fürth)			
	Jessica, TOYS“R“US (Köln)			
	Sailor Moon, IGEL (Carlow)			
	Shelly Club Lorena, MATTEL (Dreieich)			
	Steffi Love Skate „N“ Board, SIMBA TOYS (Fürth)			
Hand Puppets	Elite Kasperl–Theater, KAUFHOF (Köln)			December 1998
	John Kasperlfigur Kasper, JOHN (Freilassing)			
	Kid’s World Kasperle Figuren, C&A (Düsseldorf)	Phthalates	210 to 330 g/kg	
	Little Puppet–Show Kasperl–Figuren, SIMBA TOYS (Fürth)			
	Mini Theatre Puppet Show,, INTERCONTOR ZEK (Nürnberg)			
	Puppet–Show, Kasper–Figur,, SIMBA TOYS (TOYS „R“ US) (Fürth)			
	Puppet–Show Kasper–Figuren, SIMBA TOYS (Fürth)			
Tent Material	Eagle One Touch, S.TREKKING (QUELLE)			July 2000
	Saleva Tasmania III, SALEWA			
	Tatonka Arctis 3, TATONKA	Phthalates	130 to 260 g/kg	
	Four Seasons Tibet, FOUR SEASONS (GLOBETROTTER)			
	Jack Wolfskin Yellowstone 3, JACK WOLFSKIN	TBT	0,001 to 0,8 mg/kg	
	Buffalo BTH 180, SIMEX			
	Tour5/High Peak California , HIGH PEAK (Neckermann)	Other organotins	1 to 15 mg/kg	
	Nevada III, OTTO VERSAND			
	Lodge 5, BEST CAMP (OTTO VERSAND)			

2.2 *TEST* magazine

The *Warentest* consumer magazine was also investigated by carrying out online research. The findings have been compiled in the table below.

***Stiftung Warentest* magazine data on pollutant contents in products, online research, July 2001**

Product	Test	Data on pollutants
Colour TV	5/01	Investigated for brominated flame retardants, none found
PC monitors	12/98	no pollutants found in casings, no more detailed data
PC monitors	12/99	no data on pollutants
Computer	2/99	Pollutants found in monitor casings (Hewlett Packard Brio 8531 D6644T and Toshiba Equium 7100 S), no precise data, no data on environmental indicators
Computer	10/99	no data on pollutants
Computer	10/00	no data on pollutants
Dishwasher tabs	2/2001	no data on pollutants
Detergent	10/00	Pollution of waters was evaluated, no data on actual substances
Floor coverings: only parquet or laminate tested		no data on pollutants
Mattresses	1/2001	only data on trichlorethene
Depoliation creams	7/2001	no data on pollutants
Night creams	7/2000	Polycyclic musk compounds > 1 ppm found in six out of ten creams (in three creams > 10 ppm): Avon, Nivea, L'oreal, Vichy, Hormocenta
Insect repellant	7/00	Dimethylphthalate in Assistan Mücken-Stopp Lotion and Piz Buin Anti-Moskito After Sun)
Organic vegetables	10/00	no data on the pesticides selected in the study
Peppermint tea	11/00	
Green tea	2/99	

Appendix B 3 - Data for Substance Risk Profiles

3.0 Scaling and methods

The risk profile for properties of substancesclosely relates to the OSPAR strategy on the protection of the marine environment from hazardous substances and the current state of discussion in the EU on the identification of persistent, bioaccumulative and toxic substances (PBT). The lowest level of concern is assigned to those properties which could prompt classification of"dangerous for the environment" for a substance according to EU legislation. The highest level of concern is assigned in case substances have POP-like properties.

The measured exposure of the environment results from the substances' market volumes, their respective patterns of use and their fate in the environment. The substances are presented with concentrations in different environmental media; these neglect single peak values but are generally oriented at typical high environmental concentration levels found in the 90s.

SUBSTANCE PROPERTIES			Concern	High Concern	Very high Concern
P	Not easily degradable in water [1)]	1	Not easily		not inherently or > 40/60[43] days half life
B	Bioaccumulation	2	BCF > 100	BCF > 500	BCF > 2000
T_{wasser}	Acute toxicity to water organisms Chronic toxicity to water organisms	3	< 10000 µg/l < 1000 µg/l	< 1000 µg/l < 100 µg/l	< 100 µg/l < 10 µg/l
C,M,R	Cancerogenic, mutagenic, reprotoxic, (CMR), endocrine disruption	4	Suspicion Category III	Endocrine effects in fish, snails, birds	Category I + II or very damaging to the immune system
PRESSURE					
C_{water}	Measured concentration in fresh water	5	NWG – 0,1	0,1 – 1 µg/l	1-10 µg/l
$C_{sediment}$	Concentration in sediments p. kg	6	> 0,1 mg	> 1 mg	> 10 mg
C_{biota}	Concentration in organisms p. kg	7	> 0,01 mg	> 1 mg	> 10 mg
C_{human}	Breast milk, blood p. kg fat	8	> 1 µg	> 10 µg	> 100 µg

1) Degradability in OECD standard-screening test or simulation test (half lives)

2) The bioconcentration factor as measured in standard experiments indicates how strongly a substance accumulates in gill-breathing organisms (mostly fish) compared to the concentration in the surrounding water.

3) Lowest effect concentration is determined in short-term and long-term experiments with fish, daphnia and algae.

4) Reprotoxic, carcinogenic or mutagenic effects demonstrated in animal tests are classified in the CMR category II if they can be extrapolated to humans also. If there are doubts that the effects shown in animals could also occur in humans or in other animal species, they are classified in category III. For endocrine disruption in the environment, no test or classification system exists in the EU yet.

5 and 6) The concentration ranges refer to European rivers and do not include peak concentrations downstream of industrial discharges.

7) and 8). The concentration ranges also include concentrations found outside of Europe. The may result from accumulation in the food chain as well as direct exposure in the living and working environment.

[43] 60 days half-life under marine conditions and 40 days under freshwater conditions of no marine data available

The relevant data on substances have been compiled in the form of fact sheet tables. The following table contains the explanations on the methodological procedure. The relevant data sources are indicated below each substance data sheet.

Name	Explanation
Technical function	Technical function of substance in products or type of product in which the substance is used.
EU market volume	Sales in western Europe during the second half of the 90s; without import as component in "non-chemical" products
EU production volume	Production in western Europe during the second half of the 90s
Number of producers	Number of producers in western Europe (without importers)[44]
Potential number of industrial users	The number of manufacturing companies is a very rough estimation. It is meant to depict the ratio of the number of industrial users and the number of producers as well as the number of private end-users. • Approximately 38,000 chemical companies in Europe; distribution over sections with turnover distribution in Europe 1998[45] • Number of companies in mining and manufacturing industry in Germany in 1990: 47,000 companies with more than 20 employees. Extrapolation to EU with factor 6 = 300,000; Distribution over sections derived from German figures[46]. • Plastic manufacturing: 2,100 companies in Germany, extrapolation to EU with factor 6.
Number of potential final users	The total EU population is assumed when a substance is used as a component in chemical products or other goods which are used by consumers, in handcrafts, or by public institutions or farmers.
Number of potential waste managing companies	Number of waste treatment companies (landfills, incineration plants) extrapolated on EU by factor of six from German figures for beginning of 90s[47]
Market trends	Development of production or sales, depending on available data .
Essential usage in % market volume	Use in certain applications as per cent of total market volume
Essential release to environment from production	Calculated worst case emission to air and water from the production of the chemical substance.
Essential release to environment from processing	Calculated worst case emission to air and water from formulation of substance into a chemical product (preparations) or from industrial processing (manufacture of articles). The assumption is that 70% of emissions to water are entering sewage plants and 30% entering surface water untreated. A 90% elimination in waste water treatment plant is calculated for plastic additives, whereby a more or less high percentage is entering the environment via spraying sewage sludge onto agricultural soil.

[44] Data source: IUCLID 2002 (http://ecb.jrc.it); (Draft) EU Risk Assessment Report under 793/93, OSPAR Document 01/04/13-E (Strategies for making the EU Market for hazardous substances more transparent) and DG SANCO; (http://europa.eu.int/comm/food/fs/ph_ps/pro/index_en.htm)
[45] Data source: CEFIC; Fact & Figures, 1998
[46] Data source: German Statistical Office; Fachserie 19, Reihe 4 Umweltökonomische Gesamtrechnungen 1992
[47] Data source: Umweltbundesamt; Daten zur Umwelt 1992

Name	Explanation
Essential release to the environment from use of final products	Calculated worst case emission or losses to air and water from final use in form of chemical product (preparations) or as a component in final products (articles) in industry, business and private households. The diffuse losses to air, water and soil from products that remain in the environment after the end of their service life (e.g. underground cables, particles from erosion of surfaces) are also taken into account here. The assumption is that 70% of emissions to water are entering sewage plants and 30% surface water untreated. A 90% elimination in waste water treatment is calculated for plastic additives, whereby a more or less high percentage is entering the environment via spraying sewage sludge onto agricultural soil.
Essential release to the environment from waste treatment	Emissions to air, soil and water from the disposal of waste in landfills or incineration plants as well as from recovery (as far as data is available). Contamination of soil through utilisation of sewage sludge is only quantified if the product concerned is mainly disposed of via waste water treatment plants.
Fate of substance after service life in % of market volume (figures roundedoff)	During the use of the product, the chemical substance is partially or fully released into the environment. After expiration of the technical lifetime of the product the part not yet released into the environment becomes waste. It is either "forgotten" in the environment, since collecting it is too much effort, or it is disposed of as waste. For this option the release is assigned to air, waste water treatment plants or surface waters. The remaining substance is accordingly compared to market volume of the second half of the 90s.
Critically exposed organisms	Organisms (including humans) whose exposure to the substance is so high that adverse effects (to the most sensible organ or species in an ecosystem) can occur or can at least not be excluded
Typical environmental concentrations	The concentration in fresh water which is not exceeded by 90% of all statistically sound measured values in European rivers[48] (90%tile) The stated margins for water and sediments characterize the regional contamination during the middle and end of the 90s; local peaks due to single polluters are generally not indicated when regional contamination can well be described and already leads to concern.
Critical effect on mammals	Organs and/or type of the adverse effect
Critical effect on other organisms	Organs and/or type of the damaging effect
Critical exposure of consumers	Consumer groups and exposure pathway
Priority environmental exposure	Taxonomic group of organisms which are particularly exposed.

[48] Datasource: European Commission: Study on the prioritisation of substances dangerous to the aquatic environment (COMMPS), June 1999

3.1	**DEHP = Diethylhexylphthalate**
Technical function	Plasticisers in Polymers (mostly PVC)
EU mEU market volume	480.000 t/a
EU pEU production volume	600.000 t/a
Number of producers	> 10
Potential number of industrial users	Plastic Manufacturers: 4.000 Other Industrial Manufacturers > 10.000
Number of potential end-users	Approximately 383 million consumers
Number of potential waste managing companies	Waste treatment and disposal: > 10,000 Recovery not relevant
Production development	1970/1980: 200,000 bis 350,000 t/a 1980/1990: 350,000 bis 500,000 t/a 1990/2000: 500,000 bis 600,000 t/a
Most relevant uses In % market volume	**External use** Shoe soles 9.0 Cables 4.5 Tarpaulin, tents, rain coats 4.5 Car undercoating 1.5 Roofing material 1.5 **Interior use** Floor coverings and wall papers 25 Soft plastic profiles (doors, windows) 13 Wires, cables 13 Toys, baby equipment < 2 **Others 25**
Relevant releases from production [t/a]	Air and water 220
Relevant releases from processing [t/a]	Air and water 430
Relevant release from use of final products [t/a] * 2400 t releases to water , 7300 t to upper soils; 8200 t in underground cables not calculated as environmental pollution.	**<u>Releases to Air/Water*</u>** 2.400 Floor cleaning inside Roofs and tarpaulins Paints, Seals Shoe soles Used products in the environment 9.700* (Unterground cables) Erosion from PVC surfaces
Relevant releases from waste treatment	Unknown Sewage sludge load > 2000 t/a
Fate after end of service life in % of market volume (rounded values) * including 25% of erosion from surfaces	Releases to the environment 3 % - Water* 1 % - Soil 2 % Mineralised 10 % Landfilled 86 %

3.1	**DEHP = Diethylhexylphthalate**	
Critically exposed organisms	Fishes (?) Marine mammals and birds Babies and Children	
Typical environmental concentations * 90%ile Germany 1,25 µg/l, average 0,64 µg/l	Fresh water Sea water Sediments Biota (Fishes, Mussels) Breast milk	1-10 µg/l* up to 0,6 µg/l 1 - 20 mg/kg (dw) 2 - 13 mg/kg (ww) 10 – 160 µg/kg fat
Critical effects on mammals	Effect on testicles and fertility	
Critical effects on other organisms	Sexual differentiation in fishes (suspition)	
Priority exposure of consumers	Children's toys Infant formula Fatty food Breast milk Indoor air	
Priority environmental exposure	Fishes, sea mammals or birds through food	

Essential references*:

- Draft EU Risk Assessment Report on Diethylhexylphthalat (DEHP), Rapporteur Schweden, 2001; http://ecb.jrc.it/existing-chemicals/;
- OSPAR Document; SPS(1) 01/05/02-E: Draft OSPAR Background Document on Phthalates
- European Commission: Study on the prioritisation of substances dangerous to the aquatic environment (COMMPS), June 1999; http://europa.eu.int/comm/environment/water/water-dangersub/

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.2	**Brominated Flame Retardants** Polybrominated Diphenylethers (PBDPE) , Polybrominated Biphenyles (PBB), Tetrabrombisphenol A (TBBA) , Hexabromocyclododecane (HBCDD)
Technical function	Flame Retardant
EU market volume 1999	32,000 t/a (43% TBBA, 25% HBCD, 23% DecaBDE)
EU production volume	6,000 t/a
Number of producers	2
Potential number of industrial users	Manufacturers of plastic and electric/electronic articles > 2000
Number of potential end-users	383 million
Number of potential waste managing companies	Treatment and disposal: > 10,000 Recovery of electric and electronic waste: > 100
Production development	Slight market growth in Europe around 1,5% (1998 – 2003), though growth has downward trend.
Most relevant uses in % market volume	30 % Circuit board; 13 % Polystyrol cabinet material 21 % PS insulating substances 5 % textile coatings 7 % Polyester and Polyamid for electronic components
Relevant releases from production [t/a]	Potentially 1-10 t/a from production (most likely overestimated)
Relevant releases from processing [t/a]	Deca, TBBA and HBCD about 23 t/a
Relevant releases from use of final products [t/a] *more toxic compounds might occur in the environment through the photochemical decomposition of PBDE	About 480 t/a (Deca and HBCD from textile washing and polymer products) About 220 t/a (Deca and TBBA) releases from waste remaining in the environment)
Relevant releases from waste treatment	Unknown Brominated dioxins und furanes from thermal treatment Emission of pentaBDPE with landfill gas possible.
Fate after end of service life in % of market volume (rounded values) * including 25% of erosion from surfaces	Releases to the environment 2 % Mineralised 10 % Landfilled 88 %
Critically exposed organisms	Sediment organisms, sea mammals, birds babies* * lower-brominated isomers

3.2	**Brominated Flame Retardants** Polybrominated Diphenylethers (PBDPE) , Polybrominated Biphenyles (PBB), Tetrabrombisphenol A (TBBA) , Hexabromocyclododecane (HBCDD)
Typical environmental concentations	Data available mainly for polybrominated diphenylethers and in small amount for hexabromcylcododecan. Sediments close to industry (Deca) 3.200 µg/kg dw Sediments estuaries (Deca) 0,7 – 200 µg/kg dw Sea mammals (Penta) 100 – 7700µg/kg Fat Breast milk (penta, Octa, TBBA) 2-4µg/kg Fat Blood recycling workers (Deca) 5 µg/kg Blood fat Transformation from highly brominated to lower brominated Diphenylethers or bisphenol A (from TBBA) possible
Critical effects on mammals	Reproductive toxicity (category II) for octa , liver damage (Penta and HBCD) and behavioural effects (Penta)
Critical effects on other organisms	Highly toxic for aquatic organisms (penta und TBBA)
Priority exposure of consumers	Food chain (penta and HBCD), general contamination through brominated flame retardants bound to particulates (dust) in the air;
Priority environmental exposure	Accumulation of penta (possibly also HBCD) in the food chain and damaging effect marine mammals/birds; harmful effects for sediment organisms in the surroundings of emissions sources (Deca).

Essential References*:

- UBA Texte 25/01 bis 27/01: Erarbeitung von Bewertungsgrundlagen zur Substitution umweltrelevanter Flammschutzmittel (Band 1-3); 2000;
- EU Risk Assessment Reports on
  - Pentabromdiphenylether (Rapporteur United Kingdom), 2002; http://ecb.jrc.it/existing-chemicals/;
  - Draft Report on Octabromodiphenylether (Rapporteur United Kingdom und France), 2002; http://ecb.jrc.it/existing-chemicals/;
  - Decabromodiphenlyether (Rapporteur United Kingdom und France), 2002; http://ecb.jrc.it/existing-chemicals/;
  - Draft Report on Hexabromocyclododecan (Rapporteur Sweden), 2002
  - Draft Report on Tetrabrombisphenol A (Rapporteur UK), 2002

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.3	**Chlorinated Paraffins (CP)** Short-chain (SCCP, C_{10-13}), medium-chain (MCCP, C_{14-17}), long-chain (LCCP, $C_{>17}$)
Technical function	Lubricants, plasticiser, flame retardants
EU market volume	Approximately 64 000t/a
EU production volume	114 000t/a
Number of producers	4
Potential number of industrial users	Manufacturers of plastic products and chemicals products > 1,000 Other industrial manufacturers > 10,000
Number of potential end-users	383 million
Number of potential waste managing companies	Treatment and disposal > 10,000 Disposal of dangerous industrial waste: > 100
Production development	Only data based on development of turnover 1994: approximately. 70 000t/a 1997: approximately 73 000t/a 1998: approximately 64 000t/a (where from 85% MCCP, 6% SCCP and 9% LCCP)
Most relevant uses in % market volume	- Plasticiser in PVC 65% - In metal cutting fluids 12% - As plasticisers in varnishes, adhesives and sealing materials 9% - As flame retardant in rubber 6% - As "fattening" substance in leather 2%
Relevant releases (Input) from Production [t/a]	negligible
Relevant releases (pollution/contamination?) from processing [t/a]	- 180 t medium-chain air or waste water from PVC processing (50% each)
Relevant releases from use of final products [t/a] * 380 t of releases to air and water, approximately 1100 t to upper soils, 120 t to waste water treatment plants	**Releases to air/water:** 1500 Waste water from metal processing Waste water from leather processing Losses from PVC and rubber products **Used products in the environment:** 1600 *
Relevant releases from Waste Treatment	Unknown Sewage sludge load > 2000 t/a
Fate after end of service life in % of market volume (rounded values)	Environmental releases: 5 % - water/air 3 % - soils 2 % Mineralised: 10 % Landfilled: 85 %
Critically exposed organisms	Crustaceans in water and sediments Fish-eating ,mammals (including humans) and birds

3.3	**Chlorinated Paraffins (CP)** Short-chain (SCCP, C_{10-13}), medium-chain (MCCP, C_{14-17}), long-chain (LCCP, $C_{>17}$)
Typical environmental concentations * Draft RAR 2000	Fresh water (CP_{10-20}): 0.1 – 0.5 µg/l * Freshwater sediments (CP_{10-20}): 300 – 1000µg/l Fish ($CP_{short/mean}$): 400 – 1500µg/kg ww* Blubber from beluga whales ($CP_{short/mean}$) 20 – 50 mg/kg mean Breast milk (short and medium chain) 10 – 16 µg/kg (Fat)
Critical effects on mammals	Liver, kidney and thyroid gland tumors of male rats; developmental disorders of rats; carcinogenic Cat III for SCCP; significant data missing for estimation of effects on humans.
Critical effects on other organisms	SCCP und MCCP are very toxic for aquatic organisms, effect-level on small crustaceans at 1.6 (NOEC for MCCP) and 5 µg/l (NOEC for SCCP)
Priority exposure of consumers	Contaminated food (shells, fish)
Priority environmental exposure	Aquatic and sediment organisms in the surrounding of companies that produce or use processing fluids for leather or for the metal processing. Long-range transport of CPs up to Arctic regions. Accumulation through food chain, secondary poisoning of fish-eating birds or mammals (humans, bears)

<u>Essential References*</u>

- OSPAR SPS 00/5/1-E: Draft OSPAR Background Document on the Grouping of Substances for Assessment Purposes, Based on Example of Short, Medium and Long Chained Chlorinated Paraffins
- EU Risk Assessment Report on Short-Chain Chlorinated Paraffins, Rapporteur United Kingdom, 2001; http://ecb.jrc.it/existing-chemicals/;
- Draft EU Risk Assessment Report on Medium-Chained Chlorinated Paraffins, Rapporteur United Kingdom, Februar 2002; http://ecb.jrc.it/existing-chemicals/;

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.4	**Nonylphenolethoxylate (NPE)** and **Nonylphenol** (NP) as building block in NPEs
Technical function	NPE: Non ionic surface-active substances and intermediate
EU market volume	NP: 78.500 t/a (60% for NPE) NPE: 77.600 t/a
EU production volume	NP: 73.500 t/a NPE: 118,000t/a
Number of producers	2 (NP)
Potential number of industrial users	Manufacturers of chemical products (using NPE) > 1000
Number of potential end-users	383 Million consumers and entire business sector
Number of potential waste managing companies	No treatment or disposal Possibly utilisation of municipal waste water sludge
Production development	1994 – 1997 constant
Most relevant uses in % market volume	- Institutional cleaning (30%) - Auxiliary in plastic production (12%) - Auxiliary in textile processing (10%) - Auxiliary in leather processing (8%) - Components in pesticides (6%) - Components in Paints (5%) - Intermediate in the chemical industry (9%)
Relevant releases (Input) from production [t/a]	In water: 50 from production of NPE
Relevant releases from use of final products [t/a] * for 300 production days ** 20% of NPEO release to waste water treatment through recovery of waste water sludge	Release to water: 850* Release to soil: 6500** - 45% Cleaning - 15% Textile finishing - 6% Leather processing
Relevant releases from waste treatment	
Fate after end of service life in % of Market Volume (rounded values) * Partial decomposition in waste water treatment plant and waste incineration	Environmental releases 10 % - Water 1% - Soil 9% Mineralisation 45 %* Transformed and/or disposed 45 %
Critically exposed organisms * in English rivers more than an order of magnitude higher ** for 4 µg/l in the river	Alge, crustaceans, fishes and fish eating animals

3.4	**Nonylphenolethoxylate (NPE)** and **Nonylphenol** (NP) as building block in NPEs	
Typical environmental concentations	Fresh water Sea water: Sediments: Fish: Breast milk:	0,1 – 1 µg/l NP * < 0,08 – 0,32 µg/l NP 200 – 2000µg/kg NP dw < 30 – 1600µg/kg NP dw** 0.3 µg/l NP (total milk)
Critical effects on mammals	Endocrine effect of NP, suspected reproductive toxicity (cat III)	
Critical effects on other organisms	NPE is decomposed to Nonylphenol (NP), which is very toxic for aquatic organisms (Alge) und has endocrine effect (Fishes). NP accumulates in fishes	
Priority exposure of consumers	Food packagings can possibly emit nonylphenol.	
Priority environmental exposure	Aquatic organisms (Alge, Fishes) in the surroundings of municipal and industrial waste water treatment plants.	

<u>Essential references*:</u>

- EU Risk Assessment Report on Nonylphenol; Rapporteur United Kingdom, 2002; http://ecb.jrc.it/existing-chemicals/;
- OSPAR Document; HSC 01/5/2-E (Draft OSPAR Background Document on Nonylphenol and Nonylphenolethoxilates; 2001
- Guenther, K. et al: Endocrine Disrupting Nonylphenols are Ubiquitous in Food; Environ.Sci.Technol., 36(8), 1676-1680,2002;

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.5	**Musk-Components** **- Nitro-Musks (Keton und Xylol)** **- Polycyclic Musks (HHCB, AHTN)**
Technical function	Substitute for natural musks in the odourants industry
EU market volume	1400 t/a (where from < 5% Keton and Xylol)
EU production volume	2000 t/a
Number of producers	3 (polycyclic musks), otherwise only imports
Potential number of industrial users	6 main producers of perfumes producers of soaps, detergents, cosmetics > 1000
Number of potential end-users	Approximately 383 million
Number of potential waste managing companies	0 (no treatment or disposal) possibly utilisation of municipal sewage sludge
Production development	92: 3583 t (in perfumes) 95: 2368 t 98: 2023 t approximately 30% export in final preparations
Most relevant uses in % market volume	Use as odourant - In cosmetics (e.g. soaps, perfumes, cremes) - In detergents - In other domestic products - For textile finishing
Relevant releases from production and processing	Not relevant
Relevant releases from use of final products [t/a]	Releases to water and indirectly of soils: Nitromusks: < 40 Polycyclic musks: < 1400
Relevant releases from waste treatment	Unknown
Fate after end of service life in % of market volume (rounded values) * mineralization in water treatment plants and resorption through skin not taken into account	Environmental releases 90 %* - Water (original substance and decomposition products) - Soil (sewage sludge) Mineralisation 10%* Disposal 0%
Critically exposed organisms	Fishes, crustaceans, worms Babys, consumers of cosmetics
Typical environmental concentrations (Nitromusks) ** downward trend for Toluol und Xylol of about factor 3 since middle of the 90s; concentrations for polycyclic higher by at least factor 10	Fresh water (means): up to 0,1 µg/l Sea water (mean-max) 20-200 ng/l Sediments: up to 25 µg/kg (dw) Fishes (eel) (means) 10 – 40 µg/kg (ww) Breast milk (means) 3 – 25 µg/kg fat (max) 380 µg/kg fat

3.5	**Musk-Components** - **Nitro-Musks (Keton und Xylol)** - **Polycyclic Musks (HHCB, AHTN)**
Critical effects on mammals	Enzyme induction of rats through musk xylol Developmental disorders of rats through musk ketons; suspected carcinogen.
Critical effects on other organisms	Very toxic for aquatic and sediment organisms, the toxicity even increases with the occurrence of decomposition products (Aminomusks).
Priority exposure of consumers	Resorption through skin with use of cosmetics and domestic products, especially critical for musk keton
Priority environmental exposure	Sediment and soil organisms through direct contamination.

Essential references:*

- Draft EU Risk Assessment Report on Musk Xylene, Rapporteur The Netherlands, Summer 2002
- Draft EU Risk Assessment Report on Musk Ketone, Rapporteur The Netherlands, Summer 2002
- OSPAR DIFF 99/3/12-E: Draft Background Document concerning Elaboration of Programs and Measures on Musk Xylene and other Musks, presented by Switzerland, 1999

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.6	**3,4 Dichloranilin [DCA] (Building block and metabolite of Diuron, Linuron, Trichlorocarbanilide)**
Technical function	Herbicide, algicide; bactericide
EU market volume	3000 t/a diuron* * reference RPA 2000
EU production volume	DCA for further processing in the EU : 4.370 to 4.970 t/a - 98 % diuron, linuron - 2 % trichlorcarbanilide
Number of producers	2
Potential number of industrial users	Manufacturers of herbicide products, preservative for construction work, antifoulings (diuron, linuron), soaps and deodorants (trichlorcarbanilide) > 100
Number of potential end-users	383 million consumers, craftsmen, hobby gardeners, farmers, horticulture as well as public administration
Number of potential waste managing companies	0 for use of herbicides
Production development	Stagnating/downward trend, [no further licence/registration in Sweden and Germany (Linuron) und Sweden, Finland and the Netherlands (diuron)]
Most relevant uses in % market volume* * Only diuron und TCC	- Herbicide for paths, squares, railroad sites - Herbicide asparagus cultivation, ornamental trees, citrus fruits, cotton, wheat, grass land - Antifouling und algicide in marine paints, sealing products, façade paints - Bactericide in soap and cosmetics
Relevant releases from production	Emission of dichloranilin: 2 t/a
Relevant releases from processing [t/a]	Not relevant
Relevant releases from use of final products [t/a]	Releases to soil, water, air: > 3000 - Herbicide diuron on sealed paths and squares - Herbicide diuron in agriculture (releases to soils) - Antifouling paints - Bactericide TCCA in soaps and cosmetics
Fate after end of service life in % of market volume (figures rounded off)	100% environment Decomposition in water to dichloranilin(DCA)
Critically exposed organisms	Algae, crustaceans, worms Fishes and birds
Typical environmental concentations * calculated	Diuron fresh water up to 1 µg/l (90%) DCA fresh water up to 0,5 µg/l (90%) DCA Sediment 0,15 mg/kg* Diuron sea water (coast) 0,1 µg/l
Critical effects on mammals	Suspected carcinogen [category III] (diuron),
Critical effects on other organisms	Toxic for algae and water plants (diuron) Hormon like effects in fishes (DCA) and chronically harmful for algae, fishes, crustaceans and worms

Priority exposure of consumers	Not relevant
Priority environmental exposure	DCA: Fishes, crustaceans, sediment organisms; through food chain fishes and birds; diuron: Fishes, crustaceans

Essential References*:

- Draft EU Risk Assessment Report on 3,4 Dichloroaniline; Rapporteur Germany; 2001; http://ecb.jrc.it/existing-chemicals/;
- European Commission: Study on the Prioritisation of Substances Dangerous to the Aquatic Environment (COMMPS Procedure); 1999
- Risk Policy Analysts (RPA): Socio-Economic Impacts of the Identification of Priority Hazardous Substances under the Water Framework Directive; prepared for DG Environment; December 2000;

* Draft EU Risk Assessment Reports were used as information source. However, much of this information is still under discussion among the experts of the Member States.

3.7	**Trifluralin**	
Technical function	Selective herbicide	
EU market volume	3200 t	
EU production volume	??	
Number of producers	2	
Potential number of industrial users	Producers of plant protection products > 10	
Number of potential end-users	> 1 million farmers	
Number of potential waste managing companies	Not relevant	
Production development	No more registration/license (January 2001) in Sweden, Denmark and the Netherlands.	
Most relevant uses In % Market Volume	• Mainly winter and summer rape • In small amounts winter wheat, winter barley, cabbage, sunflower, cotton and soja	
Relevant releases from production	Not relevant	
Relevant releases from processing [t/a]	3200	
Relevant releases from use of final products [t/a]	Not relevant	
Fate after end of service life in % of market volume (rounded values)	100% releases to the environment	
Critically exposed organisms	Risk assessment not available. Crustaceans/Algae possibly critically loaded.	
Typical environmental concentations	River water 3 µg/l (90%ile), 2.7µg/l (average) on the basis of 864 measurement values from 61 stations.	
Critical effects on mammals	Sensitizing	
Critical effects on other organisms	Very toxic for fishes; NOEC fish 0.3 µg/l	
Priority exposure of consumers	?	
Priority environmental exposure	Aquatic organisms, accumulation (because BCF > 2000) cannot be excluded	

Essential references

- European Commission: Study on the Prioritisation of Substances Dangerous to the Aquatic Environment; (COMMPS procedure); 1999
- OSPAR Dokument 01/04/13-E: Strategies for making the EU Market for hazardous substances more transparent;
- OSPAR Factsheet on Trifluralin; http://www.ospar.org/Hazardous

3.8	**Dicofol** (Kelthane new)
Technical function	Contact acaricide
EU market volume	300 t/a
EU production volume	1500 to 1800 t/a
Number of producers	2 – 3
Potential number of industrial users	1
Number of potential end-users	7 million farmers
Number of potential waste managing companies	None
Production development	No more registration/licence in the Nordiccountries, Germany and the Netherlands
Most relevant uses In % market volume	Hops cultivation (possibly residues in beer), beans, peppers, cucumber, melons, pumpkins, citrus fruits and nuts
Relevant releases from processing [t/a]	Not relevant
Relevant releases from use of final products [t/a]	300
Fate after end of service life in % of market volume (rounded values)	100% Environment
Critically exposed organisms	Risk assessment not available. Possibly critical exposure through food chain for consumers and birds.
Typical environmental concentrations	Not contained in the COMMPS database; Water (max) < 0.1 µg/l Sediments (max) < 2 µg/kg Organisms (earthworms, birds) 1-10 mg/kg
Critical effects on mammals	Skin irritating and sensitizing substance (EU classification annex 67/548); suspected endocrine effects
Critical effects on other organisms	Very toxic for fishes (NOEC Fish 4.5 µg/l); toxic to reproduction of birds
Priority exposure of consumers	?
Priority environmental exposure	Accumulation possible because of BCF > 2000 and slow biodegradation in soil and water/sediment systems.

Essential References

- OSPAR Document: HSC 02/4/4-E; Draft OSPAR Document on Dicofol, 2002

3.9	**Organotin-Compounds: Tributyltin (TBT), Triphenyltin (TPT), Tricyclohexyltins**	
Technical function	Biocide (TBT) and pesticide (TPT)	
EU market volume	TBTO: approximately 1.670 t/a ; TPT: approximately 180 t/a	
EU production volume	??	
Number of producers	9 (including producers of butyltin stabilisers)	
Potential number of industrial users	Manufacturers of chemical products and plastic processing companies > 1000 other industrial processing > 10,000	
Number of potential end-users	383 million	
Number of potential waste managing companies	Treatment and disposal > 10,000 Recycling of used PVC: > 10 Disposal of hazardous industrial wastes (e.g. old paint layers): > 100	
Production development	Downwards	
Most relevant uses In % market volume * approximately 1% TBT in 17,000 t/a stabilisators and catalysts	• Antifouling paints (68%) • Pesticides in potatoe and grapevine cultivation (10%) • Impurities in dibutylzinn-stabilisers und dibutylzinncatalysts (approximately 9 %) • Organic synthesis (< 5%) • Wood preservatives, biocides in textiles (< 5 %)	
Relevant releases from processing [t/a]	Not relevant	
Relevant releases from use of final products [t/a]	400 in water [1)] 1) rough estimation: 180 t/a pesticides as well as TBT losses from the polymer matrix of marine paints in European rivers (each nearly 100 t North and Baltic Sea)	
Fate after end of service life in % of market volume (rounded values)	Environmental releases 20 % Disposal 80 %	
Critically exposed organisms	Algae, crustaceans, mussels, snails, fishes, humans (if food rich in fish)	
Typical environmental concentations (Organotin) * muscle, Marine shipping way ** muscle, German Baltic and North Sea coast	Sea water/fresh water (TBT) < 0,01 µg/l Marine seaways (TBT) 0,01 bis 0,1 µg/l Sediments in harbours (TBT) > 10 mg/kg dw Fishes/mussels fresh water (TBT)* 0,4 bis 0,9 mg/kg ww Fishes/mussels fresh water (TPT)* 0,01 bis 0,1 mg/kg ww Mussels/fishes marine (TBT)** 0,01 bis 0,02 mg/kg ww Mussels/fishes marine (TPhT)** < 0,01 bis 0,06 mg/kg ww Fishes, birds, sea mammals (liver) > 1 mg/kg ww	
Critical effects on mammals	Immuno-toxic effect	
Critical effects on other organisms	Extremely toxic for all aquatic organisms, hindrance of reproduction for snails and fishes.	
Priority exposure of consumers	When nutrition is rich with fish and mussels, especially coming from seaways.	

Priority environmental exposure	Algae, crustaceans, mussels, snails, Fishes, sea mammals, sea birds	

Essential references:

- Protokoll der Anhörung des Umweltbundesamtes vom 14.3.2000
- OSPAR 00/5/11-E; Draft OSPAR Background Document on Organic Tin Compounds
- UBA Texte 06/01: Organische Zinnverbindungen, Alkylphenole und Bisphenol A in marinen und limnischen Biota, 2001;
- ARGE Elbe: Herkunft und Verteilung von Organozinnverbindungen in der Elbe und ihren Nebenflüssen; 1999;
- Risk and Policy Analysts (RPA): Assessment of the risk to health and the Environment posed by the use of organostannic compounds (excluding use of a biocide in antifouling pints) and a description of the economic profile of the industry; May 2002

3.10	**Cadmium**
Technical function	Energy conservator in batteries, surface protection, hardening component in alloys; pigment, PVC stabiliser
EU market volume	Approximately 2,600 t/a
EU production volume	Approximately 5,800 t/a
Number of producers	9
Potential number of industrial users	30
Number of potential end-users	Approximately 383 Million consumers
Number of waste disposers	Treatment and disposal > 10,000
Production development	Consumption: 1980: 13.200 t (western world) 1994: 16,500 t 1996: 13,840 t (EU)
Most relevant uses In % market volume 1996	Batteries 75% Pigments 15% PVC stabilizer 5% Surface protection, alloy 5%
Relevant releases from production [t/a] * The environmental releases include unwanted emissions from products and production processes, not intended to extract or use cadmium.	Air/water 1-10 t + [170 from other production plants]*
Relevant releases from processing [t/a]	Air/water 1-10 t/a
Relevant releases from use of final products [t/a] * * extrapolated from Stockholm balance and German emission inventary *** pollution from mineral fertilizer	Air/water 10 – 50 ** - Tyres, breaks, road cover - Roofing material - Artist's paints - PVC stabilizers, pigments - Alloy and metal coatings [soil*** 260 t]
Relevant releases from waste treatment [t/a]	Air: 2 – 17 Water: 10
Fate after end of service life in % of market volume (rounded values)* * Assumption 25% incineration and recovery of incineration slag in road construction.	Environmental pollution: 4 % - air/water : 2 % - soil:* 2 % recovery: 22 % disposal *: 76 %
Critically exposed organisms	Living organisms (crustaceans) in lakes and rivers
Typical environmental concentations	Fresh water: up to 0,62 µg/l (solution) [minus 0,05 µg/l natural] Sediment: up to 10 mg/kg [minus 0,1 to 0,8 mg/kg natural]
Critical effects on mammals	Carcinogenic (dust) and toxic for kidneys

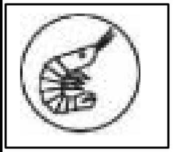
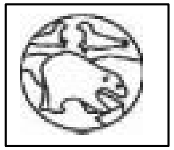
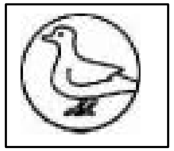
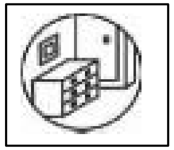
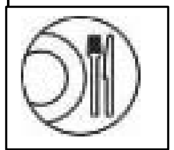
3.10	**Cadmium**
Critical effects on other organisms	Very toxic to aquatic organisms (NOEC crustaceans < 0,08 µg/l)
Priority exposure of consumers	Cigarette smoke, food and fine dust in urban exterior air
Priority environmental exposure	Aquatic organisms

Essential References*

- UBA Texte 53/00: Emissionsinventar Wasser für die Bundesrepublik Germany, 2000
- Draft EU Risk Assessment Report on Cadmium and Cadmium Oxide; Rapporteur Belgium; 2002;
- Discussion Paper on Draft Targeted Risk Assessment Report on Cadmium Used in Batteries; Februar 2002.
- Bergbäck, Johannson and Mohlander: Urban Metal Flows – A Case Study Of Stockholm; 2001

* Draft EU Risk Assessment Reports were used as information source.However, much of this information is still under discussion among the experts of the Member States.

3.3 Overview on critically exposed organisms

	Crustaceans, algae	Worms, snails	Fishes	Whale, seal, polar bear	Birds	Breast fed baby	User of daily life products	Food Consumer
DEHP			X	X	X	XX	XX	XX
Brominated flame retardants		XX		XX	XX	XX		
Chlorinated paraffins	XX	XX		X	X	XX		*
Nonylphenol	XX		XX		XX	X		X
Musk compounds		X				XX	X	
Dichloranilin/diuron	XX	XX	XX		XX			
Trifluralin	X	X	X					
Dicofol					X			X
TBT and TPT	XX	XX	XX	XX	XX			XX
Cadmium	XX	X			X			
								

XX = non acceptable risk, bold colour in the risk profiles
X = potential risk, light colour in the risk profiles

Appendix B 4 –Sources of information

ARGE Elbe: Herkunft und Verteilung von Organozinnverbindungen in der Elbe und ihren Nebenflüssen; 1999;

BBA 2001: Homepage der Biologische Bundesanstalt Braunschweig. www.bba.de

CEFIC; Fact & Figures, 1998

Bergbäck, Johannson and Mohlander: Urban Metal Flows – A Case Study Of Stockholm; 2001

Böhm et al: Ermittlung der Quellen für die prioritären Stoffe nach Artikel 16 der Wasserrahmenricht linie und Abschätzung ihrer Eintragsmengen in die Gewässer in Deutschland. Forschungsvorhaben des Umweltbundesamt (UBA-Texte 68/02), September 2002.

DG SANCO: http://europa.eu.int/comm/food/fs/ph_ps/index_en.htm

DG SANCO, Annual EU Wide Pesticide Residue Monitoring Report 2000; http://europa.eu.int/comm/food/fs/inspections/fnaoi/reports/annual_eu/monrep_2000_en.

Draft EU Risk Assessment Report (RAR) on Cadmium and Cadmium Oxide; Rapporteur Belgium; 2002;

Draft Targeted Risk Assessment Report on Cadmium Used in Batteries; Rapporteur Belgium, 2002.

Draft EU Risk Assessment Report (RAR) on Decabromdephenylether, Rapporteur France und United Kingdom, 2002; http://ecb.jrc.it/existing-chemicals

Draft EU Risk Assessment Report (RAR) on Octabromdephenylether, Rapporteur France und United Kingdom, 2002; http://ecb.jrc.it/existing-chemicals

Draft EU Risk Assessment Report (RAR) on Tetrabrombisphenol A (TBBA), Rapporteur United Kingdom, 2002

Draft EU Risk Assessment Report (RAR) on Hexabromocyclododecan (HBCD), Rapporteur Sweden, 2002

Draft EU Risk Assessment Report (RAR) on Diethylhexylphthalat (DEHP), Rapporteur Schweden, September 2001; http://ecb.jrc.it/existing-chemicals

Draft Summary EU Risk Assessment Report (RAR) on Long Chained Chlorinated Paraffins (MCCP), Rapporteur United Kingdom, November 2001;

Draft EU Risk Assessment Report (RAR) on Medium Chained Chlorinated Paraffins (MCCP), Rapporteur United Kingdom, February 2002; http://ecb.jrc.it/existing-chemicals;

EU Risk Assessment Report (RAR) on Short Chained Chlorinated Paraffins (SCCP), Rapporteur United Kingdom, 2001; http://ecb.jrc.it/existing-chemicals

Draft EU Risk Assessment Report (RAR) on Nonylphenol; Rapporteur United Kingdom, 2001; http://ecb.jrc.it/existing-chemicals

Draft EU Risk Assessment Report (RAR) on Musk Xylene, Rapporteur The Netherlands, 2002

Draft EU Risk Assessment Report (RAR) on Musk Ketone, Rapporteur The Netherlands, 2002

Draft EU Risk Assessment Report (RAR) on 3,4 Dichloroaniline; Rapporteur Germany; 2001; http://ecb.jrc.it/existing-chemicals

EC (1999): European Commission; Study on the Prioritisation of Substances Dangerous to the Aquatic Environment (COMMPS Procedure); 1999; ; http://europa.eu.int/comm/environment/water/water-dangersub/

European Commission: Public Availability on EU High Production Volume Chemicals; 1999; http://ecb.jrc.it/existing-chemials

Fraunhofer-Institute Molecular Biology and Applied Ecology (FHG): Identification of quality standards for priority substances in the field of water policy; annex 4; September 2002

Guenther, K. et al: Endocrine Disrupting Nonylphenols are Ubiquitous in Food; Environ.Sci.Technol., 36(8), 1676-1680,2002;

IUCLID 2002: EU Existing Substance Data Base; http://ecb.jrc.it/existing-chemicals

OSPAR Dokument: HSC 02/4/4-E; Draft OSPAR Document on Dicofol, 2002; www.ospar.org

OSPAR Dokument 01/04/13-E: Strategies for making the EU Market for hanzardous substances more transparent; http://www.ospar.org

OSPAR 00/5/11-E; Draft OSPAR Background Document on Organic Tin Compounds

OSPAR Factsheet on Trifluralin; http://www.ospar.org

OSPAR DIFF 99/3/12-E: Draft Background Document concerning Elaboration of Programs and Measures on Musk Xylene and other Musks, presented by Switzerland, 1999; http://www.ospar.org

OSPAR SPS 00/5/1-E: Draft OSPAR Background Document on the Grouping of Substances for Assessment Purposes, Based on Example of Short, Medium and Long Chained Chlorinated Paraffins,2000; http://www.ospar.org

OSPAR 00/5/11-E; Draft OSPAR Background Document on Organic Tin Compounds; http://www.ospar.org

OSPAR Document; HSC 01/5/2-E (Draft OSPAR Background Document on Nonylphenol and Nonylphenolethoxilates); 2001; http://www.ospar.org

OSPAR Fact Sheets on Substances of possible concern: http://www.ospar.org

Risk and Policy Analysts (RPA): Assessment of the risk to health and the Environment posed by the use of organostannic compounds (excluding use of a biocide in antifouling pints) and a description of the economic profile of the industry; May 2002

UBA Texte 53/00: Emissionsinventar Wasser für die Bundesrepublik Germany, 2000

UBA 2001: Protokoll der Anhörung des Umweltbundesamtes vom 14.3.2000

UBA Texte 25/01 bis 27/01: Erarbeitung von Bewertungsgrundlagen zur Substitution umweltrelevanter Flammschutzmittel (Band 1-3); 2000;

UBA Texte 06/01: Organische Zinnverbindungen, Alkylphenole und Bisphenol A in marinen und limnischen Biota, 2001;

VVV Kommission: Kommission der Niedersächsischen Landesregierung zur Vermeidung, Verminderung und Verwertung von Abfällen; Bericht des Arbeitskreises 13; 2000;

Statistisches Bundesamt; Fachserie 19, Reihe 4 Umweltökonomische Gesamtrechnungen 1992

Umweltbundesamt; Daten zur Umwelt 1992

TemaNord 2000:550: Fate and Effects of Chemicals in the Nordic Environments Related to the Use of Biocides, 2000

Anhand von zehn Fallbeispielen zeigt die vorliegende Studie, dass in Europa häufig gefährliche Stoffe bei der Herstellung von Konsumprodukten verwendet werden. Sie finden über Haut, Atemwege und die Nahrung ihren Weg in unsere Körper. Die Fallbeispiele verdeutlichen, wie nötig ein neues und starkes EU-Chemikalienrecht ist, um die Risiken gefährlicher Stoffe rechtzeitig und effektiv bekämpfen zu können. Dazu gehört auch, dass Produzenten und Importeure von Chemikalien verpflichtet werden, ihre Produkte zu registrieren und genügend Daten für eine vernünftige Risikobewertung aller sich auf dem Markt befindlichen und produzierten Stoffe zu liefern.

S 1281

Greenpeace e.V. 22745 Hamburg Tel. 040/306 18-0; Fax. 040/30618-100
Email: mail@greenpeace.de Politische Vertretung Berlin, Chausseestr. 131, 10115 Berlin
Tel. 030/30 88 99-0, Fax 030/30 88 99-30 Internet: www.greenpeace.de

GREENPEACE