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Community Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants

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Preface

This Commission Staff Working Paper presents the final version of the European Community Implementation Plan on Persistent Organic Pollutants (POPs) which, according to Regulation (EC) No 850/2004 on persistent organic pollutants[1], is to be developed within two years from entry into force of the Regulation.

A broad consultation on a first version of the Community Implementation Plan with Member States' competent authorities, industry and environmental organisations has been carried out. This final version of the Staff Working Paper also includes new information on by-product POPs and reflects the comments from stakeholders.

The Community Implementation Plan on POPs (POPCIP) is to be submitted to the Secretariat of the 2001 Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention), of which the European Community is a party.

The POPCIP also covers the substances that are included in the UNECE (United Nations Economic Commission for Europe) Protocol to the 1979 Convention on Long-Range Trans-boundary Air Pollution on Persistent Organic Pollutants (UNECE Protocol on POPs). The UNECE Protocol on POPs, in fact, contains a similar albeit less demanding obligation to "develop appropriate strategies and policies" to implement the provisions thereby included..

The overall purpose of the POPCIP is not only to fulfil legal obligations, but also to take stock of actions taken and lay down a strategy and action plan for further Community measures related to POPs.

The POPCIP aims to:

- identify the existing Community level measures related to POPs;
- assess their efficiency and sufficiency in meeting the obligations of the Stockholm Convention;
- identify needs for further Community level measures;
- establish a plan for implementing the further measures;
- identify and strengthen links and potential synergies between POP management and other environmental policies and other policy fields; and
- increase awareness on POPs and their control measures.

It is likely that the Community Implementation Plan will need to be revised when new information on releases of POPs and appropriate control measures are gathered. The European Union (EU) is also determined to have additional POP substances listed in the Stockholm Convention. This would lead to the need to broaden the Community Implementation Plan to cover actions on the new POPs.

[1] OJ L 158, 30.4.2004, p. 7.

1 INTRODUCTION

1.1 Persistent Organic Pollutants (POPs)

POPs are chemical substances that persist in the environment, bio-accumulate, and pose a risk of causing adverse effects to human health and/or the environment. These pollutants are transported across international boundaries far from their sources, even to regions where they have never been used or produced. The ecosystems and indigenous people of the Arctic are particularly at risk because of the long-range environmental transportation and bio-magnification of these substances. The Baltic and the Alpine regions are also cited as examples of EU sinks of POPs. In fact, POPs pose a threat to the environment and/or to human health all over the globe. International action has been deemed necessary to reduce and eliminate production, use and releases of these substances.

The substances addressed in the international legal instruments on POPs and some further candidates proposed by Parties are listed in Table 1.

1.2 International agreements addressing POPs

1.2.1 UNECE Protocol on POPs

The Executive Body to the UNECE Convention on Long-Range Trans-boundary Air Pollution (CLRTAP) adopted the UNECE Protocol on POPs on 24 June 1998 in Aarhus, Denmark (http://www.unece.org/env/lrtap/pops_h1.htm). The UNECE Protocol on POPs focuses currently on a list of 16 substances comprising eleven pesticides, two industrial chemicals and three unintentional by-products. The ultimate objective is to eliminate any discharges, emissions and losses of these POP substances.

The UNECE Protocol on POPs bans the production and use of some products outright (aldrin, chlordane, chlordecone, dieldrin, endrin, hexabromobiphenyl, mirex and toxaphene). Others are scheduled for elimination at a later stage (Dichloro-Diphenyl-Trichloroethane (DDT), heptachlor, hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs)). Finally, the UNECE Protocol on POPs severely restricts the use of DDT, hexachlorocyclohexane (HCH) (including lindane) and PCBs. The UNECE Protocol on POPs also includes provisions for dealing with the wastes of products that will be banned and it obliges Parties to reduce their emissions of dioxins, furans, polycyclic aromatic hydrocarbons (PAHs) and HCB below their levels in 1990 (or an alternative year between 1985 and 1995). For the incineration of municipal, hazardous and medical waste, it lays down specific limit values.

The UNECE Protocol on POPs was signed by 36 of 48 Parties to the CLRTAP. The UNECE Protocol on POPs entered into force 23 October 2003. By February 2007, 28 Parties, including the Community and 21 Member States have ratified it (cf Table 2).

1.2.2 Stockholm Convention

The Stockholm Convention on POPs (http://www.pops.int/documents/convtext/convtext_en.pdf) was formally adopted on

22-23 May 2001 in Stockholm, Sweden, upon completion of three years of negotiations conducted in the framework of the United Nations Environment Programme (UNEP). This international regime promotes global action on an initial cluster of twelve POP substances, which are all included in the UNECE Protocol on POPs, too. The overall objective of the Stockholm Convention is to protect human health and the environment from POPs. Specific reference is made to a precautionary approach as set forth in Principle 15 of the 1992 Rio Declaration on Environment and Development. Most importantly, this principle is made operational in Article 8, which lays down the rules for including additional chemicals in the Stockholm Convention.

The nine intentionally produced chemicals currently listed in Annex A of the Stockholm Convention (aldrin, chlordane, dieldrin, endrin, hexachlorobenzene, heptachlor, mirex, toxaphene and PCBs) are subject to a ban on production and use except where there are generic or specific exemptions. In addition, the production and use of DDT, a pesticide still used in many developing countries for malaria and other disease vector control, is severely restricted, as set out in Annex B of the Stockholm Convention.

The generic exemptions allow laboratory-scale research, use as a reference standard and unintentional trace contaminants in products and articles. Articles in use containing POPs are also subject to an exemption provided that Parties submit information on the uses and the national plan for waste management for such articles to the Secretariat of the Stockholm Convention.

Import and export of the ten intentionally produced POPs is severely restricted by the Stockholm Convention. After all substance specific exemptions have ceased, import and export is allowed only for the purpose of environmentally sound disposal under restricted conditions.

Special provisions are included in the Stockholm Convention for those Parties with regulatory assessment schemes to review existing chemicals for POPs characteristics and to take regulatory measures with the aim of preventing the development, production and marketing of new substances with POP characteristics.

Releases of unintentionally produced by-products listed in Annex C (dioxins, furans, PCBs and HCB) are subject to continuous minimisation with, as objective, the ultimate elimination where feasible. The main tool for this is the National Action Plan which should cover the source inventories and release estimates as well as plans for release reductions. The most stringent control provision with regard to by-products is that Parties shall promote and, in accordance with their action plans, require the use of best available techniques for new sources within their major source categories identified in Part II of Annex C of the Stockholm Convention.
The Stockholm Convention also foresees identification and safe management of stockpiles containing or consisting of POPs. Waste containing, consisting of or contaminated with POPs should be disposed of in such a way that the POP content is destroyed or irreversibly transformed so that it does not exhibit POPs characteristics. Where this does not represent the environmentally preferable option or where the POP content is low, waste shall be otherwise disposed of in an environmentally sound manner. Disposal operations that may lead to recovery or re-use of POPs are explicitly forbidden. With regard to shipment of wastes, relevant international rules, standards and guidelines, such as the 1989 Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, are to be taken into account.

In addition to control measures, the Stockholm Convention includes several general obligations. Each Party is obliged to develop and endeavour to implement a National Implementation Plan, facilitate or undertake the exchange of information and promote and facilitate awareness and public access to information on POPs. The Parties shall also encourage or undertake appropriate research, development, monitoring and co-operation pertaining to POPs, and where relevant, to their alternatives and to candidate POPs. They shall also regularly report to the Conference of the Parties on the measures taken to implement the provisions of the Stockholm Convention.

The Stockholm Convention recognises the particular needs of developing countries and countries with economies in transition and therefore specific provisions on technical assistance and on financial resources and mechanisms are included in the general obligations.

Table 1. POPs addressed by the Stockholm Convention, the UNECE Protocol on POPs and those additional ones proposed by the Parties so far.

	CAS No	EC No	Status under the POP agreements
Intentionally produced POPs			
Aldrin	309-00-2	206-215-8	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Chlordane	57-74-9	200-349-0	Listed both in the Convention and in the UNECE Protocol on POPs
Chlordecone	143-50-0	205-601-3	Listed in the UNECE Protocol on POPs; Proposed by the EU to be listed in the Stockholm Convention
Dieldrin	60-57-1	200-484-5	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Endrin	72-20-8	200-775-7	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Heptachlor	76-44-8	200-962-3	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Hexachlorobenzene (HCB)	118-74-1	204-273-9	Listed both in the Convention and in the UNECE Protocol on POPs
Hexabromobiphenyl (HBB)	36355-01-8	252-994-2	Listed in the UNECE Protocol on POPs; Proposed by the EU to be listed in the Stockholm Convention
Hexachlorocyclohexane (HCH, including lindane, its γ-isomer)	608-73-1, 58-89-9	210-168-9, 200-401-2	Listed in the UNECE Protocol on POPs; Lindane has been proposed by Mexico to be listed in the Stockholm Convention
Mirex	2385-85-5	219-196-6	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Toxaphene	8001-35-2	232-283-3	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Polychlorinated Biphenyls (PCBs)	1336-36-3 and others	215-648-1 and others	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl) ethane)	50-29-3	200-024-3	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Unintentionally produced POPs			
Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)	1746-01-6 and others	217-122-7 and others	Listed both in the Convention and in the UNECE Protocol on POPs
Hexachlorobenzene (HCB)	118-74-1	204-273-9	Listed both in the Stockholm Convention and in the UNECE Protocol on POPs
Polychlorinated biphenyls (PCBs)	1336-36-3 and others	215-648-1 and others	Listed only in the Stockholm Convention

Polycyclic aromatic hydrocarbons (PAHs) [1]	207-08-9 and others	205-916-6 and others	Listed only in the UNECE Protocol on POPs
Substances not yet listed in either of the POP agreements but formally proposed by a Party to be included in Annexes of the POP agreements for a total ban or for restrictions.			
Hexachlorobutadiene (HCBD)	87-68-3	201-765-5	Proposed by the EU to be listed in the UNECE Protocol on POPs
Commmercial Octabromodiphenyl ether (c-OctaBDE)	32536-52-0	251-087-9	Proposed by the EU to be listed in the UNECE Protocol on POPs and in the Stockholm Convention
Pentachlorobenzene (PCBe)	608-93-5	210-172-0	Proposed by the EU to be listed in the UNECE Protocol on POPs and in the Stockholm Convention
Polychlorinated napthalenes (a group of substances containing one to eight chlorine atoms) (PCNs)	1335-87-1 and others	215-641-3 and others	Proposed by the EU to be listed in the UNECE Protocol on POPs
Short-chained chlorinated paraffins (alkanes, C10-C13, chloro) (SCCPs)	85535-84-8	287-476-5	Proposed by the EU to be listed in the UNECE Protocol on POPs and in the Stockholm Convention
Perfluorooctane sulfonate (PFOS)			Proposed by the EU to be listed in the UNECE Protocol on POPs. Proposed by Sweden to be listed in the Stockholm Convention
Commmercial Pentabromodiphenylether (c-PentaBDE)	32534-81-9	251-084-2	Proposed by Norway to be listed in the UNECE Protocol on POPs and in the Stockholm Convention
α-hexachlorocyclohexane (α-HCH)	319-84-6	206-270-8	Proposed by Mexico to be listed in the Stockholm Convention
β- hexachlorocyclohexane (β - HCH)	319-85-7	206-271-3	Proposed by Mexico to be listed in the Stockholm Convention

[1] For the purpose of emission inventories, the following four compound indicators shall be used: benzo(a)pyrene, benzo(b) fluoranthene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene.

Altogether 150 countries and the European Community signed the Stockholm Convention in the time limit set for signatories. The Stockholm Convention entered into force 17 May 2004. On the 1st February 2007, 139 countries, including 21 Member States and two candidate countries, and the European Community have ratified it. The Community became a Party to the Stockholm Convention in February 2005.

Table 2. Status of signature and ratification of the two POP agreements by the Community, the EU Member States and candidate countries as of 1 February 2007.

	Signature(S) / Ratification (R) of the UNECE Protocol on POPs	**Signature (S) / Ratification (R) of the Stockholm Convention**
Austria	R	R
Belgium	R	R
Bulgaria	R	R
Croatia*	S	R
Cyprus	R	R
Czech Republic	R	R
Denmark	R	R
Estonia	R	-
Finland	R	R
France	R	R
Germany	R	R
Greece	S	R
Hungary	R	S
Ireland	S	S
Italy	R	S
Latvia	R	R
Lithuania	R	R
Luxembourg	R	R
Malta	-	S
Netherlands	R	R
Poland	S	S
Portugal	S	R
Romania	R	R
Slovakia	R	R
Slovenia	R	R
Spain	S	R
Sweden	R	R
The Former Yugoslav Republic of Macedonia*	-	R
Turkey*	-	S
United Kingdom of Great Britain and Northern Ireland	R	R
European Community	R	R
Total amount of ratifications: **Total amount ratifications and/or signatures:**	**21** **28**	**21** **29**

* Candidate country

1.3 European Community as a Party to the International agreements on POPs

The Community participated actively in the negotiations of the UNECE Protocol on POPs and of the Stockholm Convention. Both the Stockholm Convention and the UNECE Protocol on POPs were explicitly made open for signature and ratification to Regional Economical Integration Organisations (REIO). The European Community is regarded as such an organisation.

The Stockholm Convention defines Parties and REIOs in its Article 2. A REIO means an organization constituted by sovereign States of a given region to which its Member States have

transferred competence in respect of matters governed by the Stockholm Convention and which has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the Stockholm Convention. Article 23 lays down a specific voting rule for REIOs: A REIO, on matters within its competence, shall exercise its right to vote with a number of votes equal to the number of its Member States that are Parties to the Stockholm Convention. Such an organization shall not exercise its right to vote if any of its Member States exercises its right to vote, and vice versa.

The 1979 Convention on Long-Range Trans-boundary Air Pollution (CLRTAP) includes a provision on signature by regional economic integration organizations, "constituted by sovereign States members of the Economic Commission for Europe, which have competence in respect of the negotiation, conclusion and application of international agreements in matters covered by the present Convention". Furthermore, CLRTAP stipulates that in matters within their competence, such regional economic integration organizations shall, on their own behalf, exercise the rights and fulfil the responsibilities which the present Convention attributes to their Member States and that in such cases, the Member States of these organizations shall not be entitled to exercise such rights individually.

1.4 Purpose of the EU/Community Implementation Plan (POPCIP) on Persistent Organic Pollutants

The Stockholm Convention lays down an obligation to all Parties, including REIOs, to develop and endeavour to implement a plan for the implementation of its obligations under the Stockholm Convention.

For the European Community, this obligation is also transferred to the Article 8 of Regulation (EC) No 850/2004 on Persistent Organic Pollutants. The Community has therefore developed a Community Implementation Plan on POPs (POPCIP), which also covers the substances that fall under the UNECE Protocol on POPs.
The overall purpose of the POPCIP is not only to fulfil these legal obligations but also to take stock of actions taken and lay down a strategy and action plan for further Community measures related to POPs included in the Stockholm Convention and/or in the UNECE Protocol on POPs.

The POPCIP therefore aims to:

- identify the existing Community level measures related to POPs;
- assess their efficiency and sufficiency in meeting the obligations of the Stockholm Convention;
- identify needs for further Community level measures;
- establish a plan for implementing the further measures;
- identify and strengthen links and potential synergies between POP management and other environmental policies and other policy fields; and
- increase awareness on POPs and their control measures.

PART I - PARTY BASELINE

2 Overall Assessment of the POPs issue in the EU

At the EU level, substantial progresses have been achieved in limiting the use of the POPs substances and in reducing their emissions to environment. However, there are ongoing releases to the environment as well as a constant cycling of substances released in former times. A study (BiPRO, 2005[2]) estimating the mass flows on POPs has been performed to obtain an overview on the dimension and distribution of POP contamination in Europe.

The mass flows have been calculated by means of a computer based system. Activity data, waste generation factors and specific contamination data for emissions and solid residues in 25 EU Member States (EU-25[3]) have been used as input parameters. Based on these data, figures on annual generation of wastes and annual discharge of specific POPs from important sectors on EU-25 and Member State level have been calculated. Overall mass flows indicating the relative importance of annual discharges to wastes in relation to air emissions and environmental loads have been established on EU-25 level. As illustrated below (see figure 1) the overall structure of the mass flows (macro dimension) follows a material flow station approach, including emissions and discharge to products, but focussing on solid residues (waste) and its management. In order to identify relevant inputs and waste fractions, the various stages of the applied process technology have to be taken into consideration for each investigated source sector (micro dimension of the mass flows).

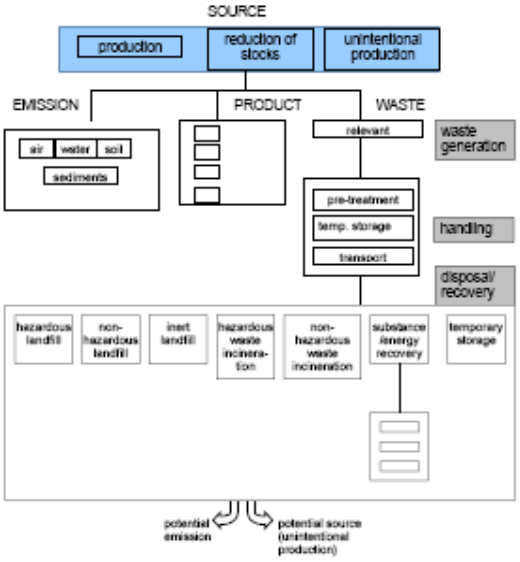

Figure 1: General structure of mass flow (macro dimension) from BiPRO (2005).

[2] BiPRO (2005): Study to facilitate the implementation of certain waste related provisions of the Regulation on POPs (see http://ec.europa.eu/environment/waste/studies/pdf/pops_waste_full_report.pdf)

[3] EU-25 means the Member States on the 31st December 2006 (EU-15 + EU-10) :
EU-15 => Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
EU-10 => Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia.

2.1 Intentionally produced POPs

2.1.1 POP Pesticides

All the intentionally produced pesticides listed in the Stockholm Convention or in the UNECE Protocol on POPs have been phased out in the EU, most of them already several years ago, with the exception of lindane that can be used until end of 2007 as public health and veterinary topical insecticide. Information on their historical production, import and use in the EU is incomplete, but the current status is that there is no production or use of most of the pesticides listed in the Stockholm Convention anymore. Therefore anthropogenic discharge mainly results from remaining obsolete stocks and secondary emissions from landfills, contaminated sites and sediments.

POP pesticides Aldrin, Dieldrin, Endrin, Chlordane, DDT, Heptachlor, Chlordecone, Mirex, and Toxaphene were largely produced and used as insecticides for crop and wood protection in the 1950s and 1960s. Most of these substances have also been widely used in the EU-25 and obsolete stockpiles still exist in some EU Member States.

Figure 2 below presents major pathways and amounts of POP pesticides in the EU-25 (BiPRO, 2005).

There is still ongoing production of one of the Stockholm Convention POP pesticides: DDT is still allowed to be used as an intermediate for Dicofol, another pesticide in one existing production plant (estimated amount: 3,000 t/y).

Taking into account all available information, and assuming that the EU-15 Member States have already destroyed their stocks of POP pesticides, a volume of POP pesticides stockpile of about 5,370 t can be calculated (Czech republic 19 t; Cyprus No stocks; Estonia 6 t; Hungary 59 t; Latvia 375 t; Lithuania 378 t; Malta No stocks; Poland 4,500 t; Slovenia No stocks; Slovakia 29 t).

Major POP components within these 5,370 t are: DDT (622 t); HCH (270 t); Toxaphene (213 t); Endrin (0.2 t); Aldrin/ Dieldrin (40 t); HCB (62 t). In Poland most of the POP-Pesticides (4,500 t) in stocks, are not specified.

The annual input to the overall flow consists of the reduction of remaining pesticide stocks (5,370 t) assumed as linear over a period of 10 years and the estimated production figure for DDT.

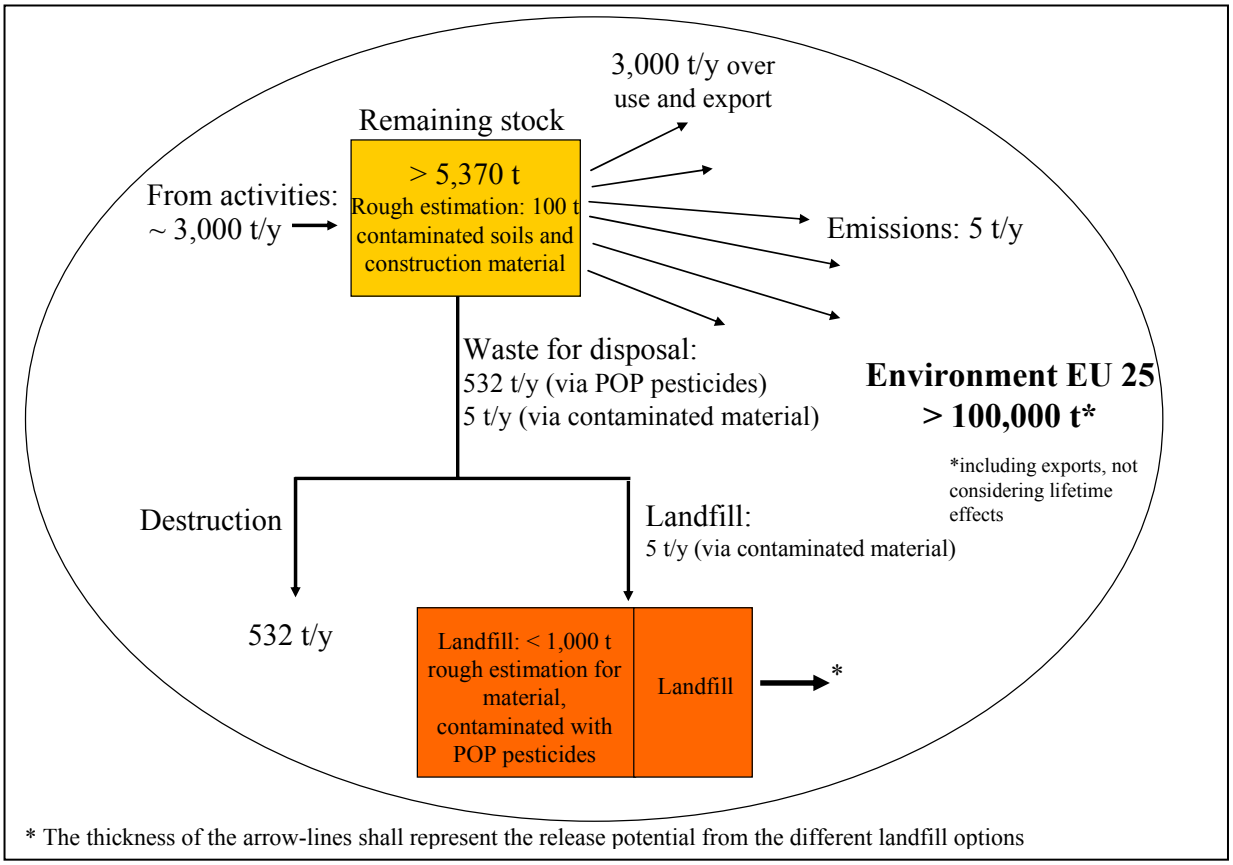

Figure 2: Major pathways and amounts of POP pesticides distributed in EU-25 (BiPRO, 2005).

The yellow boxes represent the total amount of POPs, be it stored or in products currently in use. Orange boxes represent the total amount of a POP in landfills, as a waste or part of a waste containing that POPs.

The value under "Environment EU 25" is the estimated total amount of the POP currently in the environment of all the EU-25, that is, the total amount that has been spilled to the environment (for all the compartments).

The above presented figures do not include other pesticides than POPs pesticides, which are often completely mixed all together. It also does not consider POPs pesticides which may exist in Romania and Bulgaria. Altogether the International HCH & Pesticides Association (IHPA) and Milieukontakt Oosteuropa (MK) reported a total of 24,682 – 26,682 tonnes of obsolete pesticides in the EU-10. Also in Western Europe obsolete pesticides has been disposed of. For instance in France 10,000 tonnes of obsolete stocks from farms are being disposed of by the end of 2006. In addition, the IHPA and MK point out that the 100 tonnes contaminated soils and construction materials indicated in figure 2 would underestimate the real situation by far. Especially at former stores where no concrete floors are present one has to reckon with considerable leakages.[4]

Destruction (thermal) is the only treatment option recommended for POP pesticides. As all remaining stockpiles of POP pesticides are deemed as POP wastes in the POP Regulation.

[4] (IHPA, 2006) International HCH & Pesticides Association and (MK) Milieukontakt Oosteuropa: Contribution to stakeholder Consultation on this document, submitted on 6 October 2006

Based on this premise destruction will be the dominating pathway for POP pesticides in the waste regime.

Another important pathway which however could only be quantified with significant uncertainty due to missing data is the landfilling of contaminated construction and demolition waste including excavated soils from contaminated sites. Experiences learn that the amounts of contaminated soils around old stocks are substantially more than the amounts of pesticides stored.

Based on the limited data available for POP pesticides - the identification and destruction of remaining obsolete stockpiles and the controlled disposal of contaminated soils and construction and demolition waste is to be regarded as priority action.

2.1.2 HCB and HCH (in particular lindane, the γ-HCH isomer)

HCB is not known to be produced or used for long time in the EU whereas lindane has been produced until 1990s in the EU and is still allowed to be used for few very specific biocidal and veterinary medicinal purposes. The use of lindane in the EU is to be totally phased out by the end of 2007.

Figure 3 below presents major pathways and amounts of HCB and HCH in the EU-25 (BiPRO, 2005).

In this study, the mass flows for HCB and HCH initiate at two types of sources: The ongoing production of Lindane with an estimated volume of ~1,000 t/y and the reduction of stocks of former production (mainly HCH). As the exact amount of HCH retained in contaminated soils and construction and demolition waste could not be quantified, estimated amounts from HCH dumping at former production sites and HCB from combustion processes form the source of a mass flow to waste in a dimension of 10,000 t (i.e., 1, 000t/y).

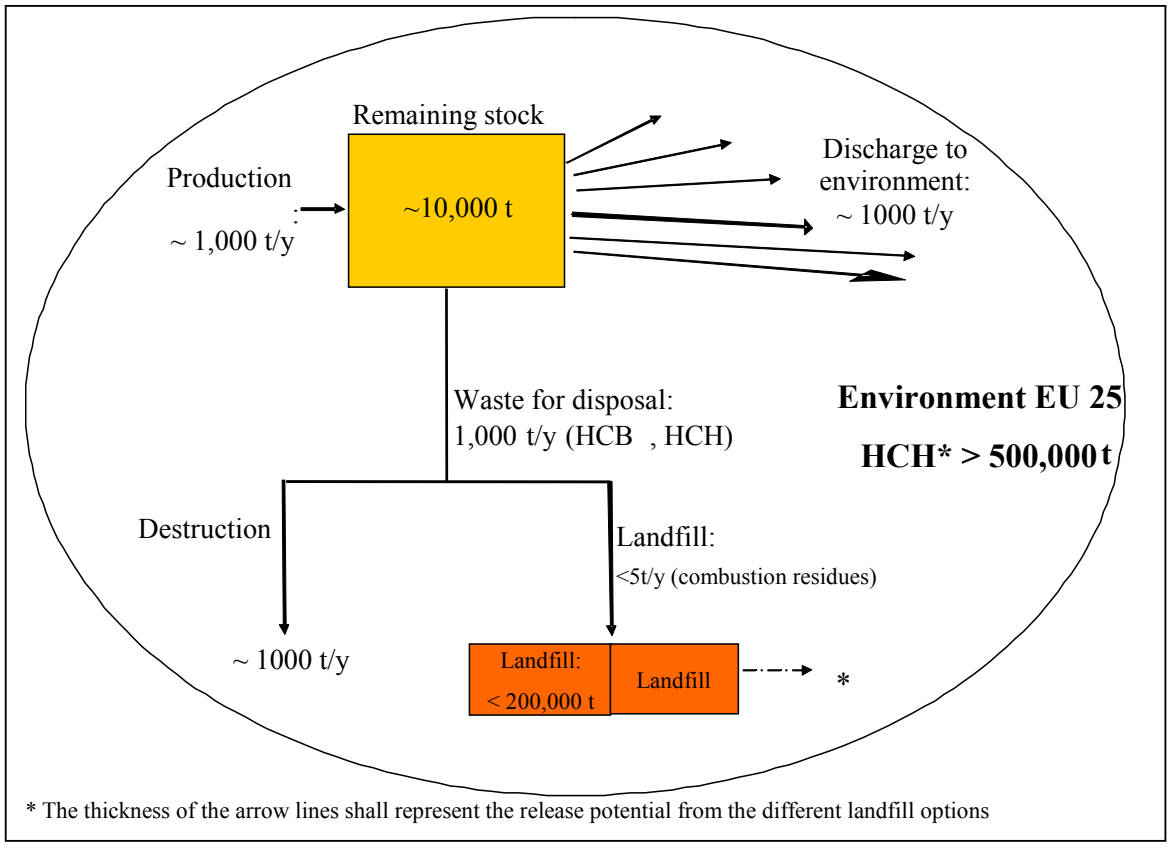

Figure 3: Major pathways and amounts of HCB and HCH distributed in EU 25; HCH figures are sum figures for α, β, γ and δ-isomers (BiPRO, 2005).

The yellow boxes represent the total amount of HCB and HCH, be it stored or in products currently in use. Orange boxes represent the total amount of HCB and HCH in landfills, as a waste or part of a waste containing HCB and HCH. The value under "Environment EU 25" is the estimated total amount of HCB and HCH currently in the environment of all the EU 25, that is, the total amount that has been spilled to the environment (for all the compartments).

As illustrated in the figure an estimated linear reduction of the remaining stocks of HCH and less HCB in dump sites at former producers leads to an annual waste stream of estimated 1,000 tons mainly directed to destruction operations. In addition there is a mass flow of < 5 t/y directed mainly to landfills via flue gas treatment residues from different combustion processes (waste incineration, power production, metallurgical industry).

A more recent study (IHPA, 2006) gives more information on the amounts of lindane in the EU environment. This study indicates that about 300,000 t of lindane have been used within the EU between 1950 and 2000 and shows that the amount of 10,000 t for the HCH residuals is not at all reflecting the reality and is of an other order of magnitude too low.

The same study reports two main European cases on HCH in the Netherlands and Spain (Basque country). These cases have proven that often the original waste problem has been grown to a huge soils problem: For example, the original amount of 5500 tons of HCH waste in the Netherlands has created a regional soil contamination of nearly 400 000 m^3. Similar experiences can be stated from Basque Country where nearly 90 000 tons of HCH waste has led to a soil problem of 500.000 -1 Mio tons of with HCH contaminated soils.

For the EU, the historical contamination of soil with HCH is probably one of the main problems linked to POP compounds. Identification and quantification of the extent of this problem to develop appropriate risk management shall be regarded as a priority action.

2.1.3 PCBs

PCBs have been widely used in the EU, especially in electronic equipment such as transformers and capacitors but also in several open uses. In 1985, the use and marketing of PCBs in the European Community were very heavily restricted. More recently, the production, placing on the market and use of PCBs were totally prohibited by Regulation (EC) No 850/2004. However, PCBs enter the waste regime via long-lasting products and construction material reaching its waste stage.

Figure 4 below presents major pathways and amounts of PCBs in the EU-25 (BiPRO, 2005).

All figures for PCB given in this report are figures for total PCB figures. No information is currently available on the related PCB-TEQ[5] concentrations. However, it is known that the technical mixtures whose remaining represent the largest share of the overall PCB mass flow did only contain small amounts of dioxin like congeners. The exact share varied in each product, but the dimension of the ratio total PCB/PCB-TEQ is about 10^5 to 10^6 In order to have comparable figures the calculation of total PCB in this report is based on the measurement of 6 Indicator PCB multiplied by a factor of 5. For large PCB containing equipment the figures have been calculated as pure PCB contained in the liquids.

The dimension of these mass flows can be added up to about 6,250 t/y.

[5] TEQ : International Toxic EQuivalents of dioxins and furans (PCDD/PCDF). A system to calculate the total toxicity of the sum of several PCDD/PCDF congeners by rating them against the most toxic one (2,3, 7,8-tetrachlorodibenzo-p-dioxin).

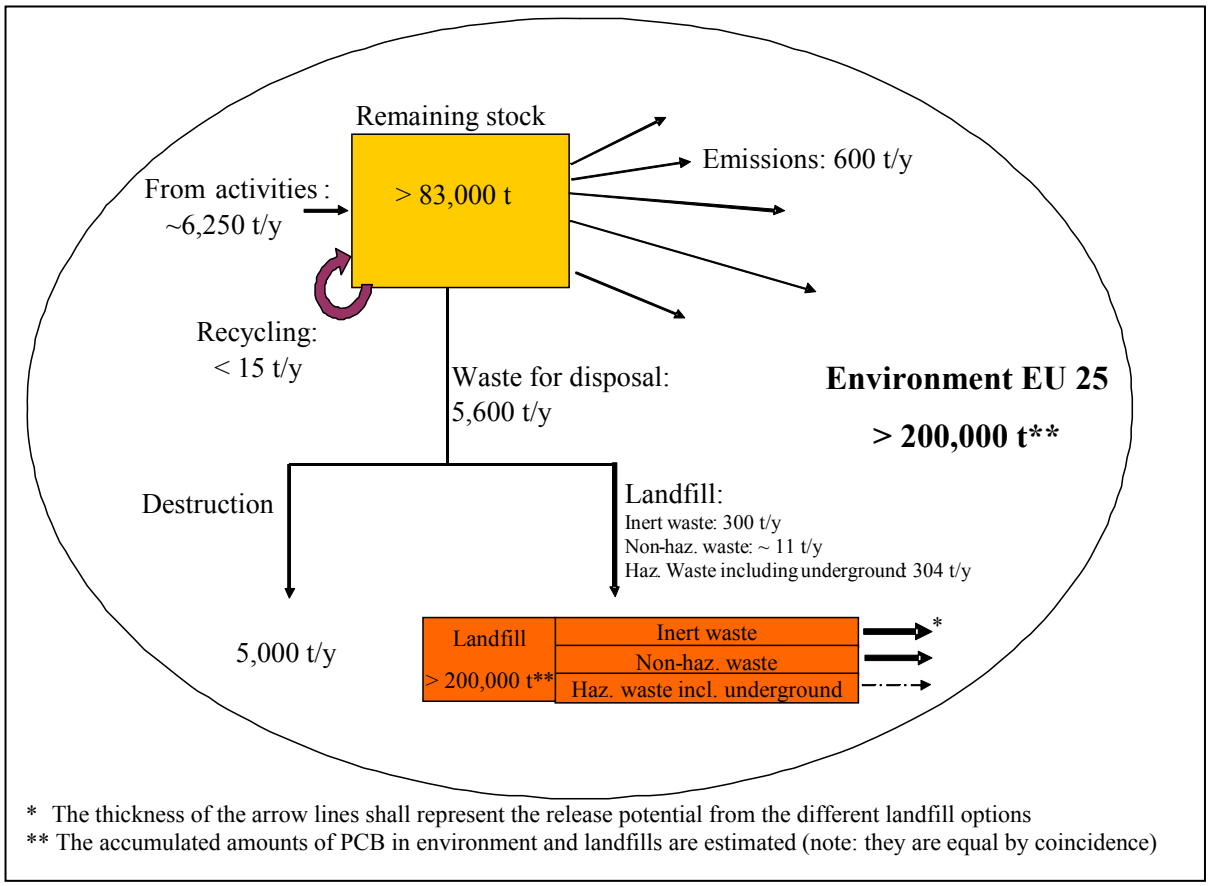

Figure 4: Major pathways and amounts of PCB distributed in EU 25

The yellow boxes represent the total amount of PCBs, be it stored or in products currently in use. Orange boxes represent the total amount of PCBs in landfills, as a waste or part of a waste containing PCBs. The value under "Environment EU 25" is the estimated total amount of PCBs currently in the environment of all the EU-25, that is, the total amount that has been spilled to the environment (for all the compartments).

The emissions/discharges are quoted on an annual basis whereas the environmental load has been calculated as a minimum estimate on the basis of literature data which state that about 30% of the estimated 700,000 tons of PCBs produced has already been spilled to the environment. The remaining stocks have been calculated on the basis of best estimates from the mass flow including besides other data from country reporting on large PCB containing equipment (transformers, capacitors, and hydraulic machinery), small capacitors in white goods, shredder residues and waste oils.

The study (*i.e.*, BiPRO, 2005) states that due to the dominating role of large PCB containing equipment in the overall mass flow of PCB, over 80% of the overall discharge of PCB to waste is already regulated by the Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)[6].

It is concluded that – under the reservation of limited data availability with regards to the PCB mass flow – the destruction of PCB containing equipment still has to be regarded as priority action for the reduction of the overall PCB load. The second important measure to be taken

[6] OJ L 243, 24.9.1996, p. 31.

seems to be the control and thorough separation of PCB from construction and demolition waste in order to further reduce and prevent discharge of PCB from poorly sealed landfills. For both measures EU legislation already exists. However the implementation in the construction and demolition waste sector is ambitious and requires more efforts for the identification, collection and disposal of wastes contaminated with PCB in open uses.

Directive 96/59/EC requires the elimination of PCBs in inventoried equipment by 2010. A review of the situation at this stage should reveal whether the regulative measures in place are sufficient, to separate and destroy potentially PCB contaminated parts and liquids (Directive 2000/53/EC[7] on end-of life vehicles, Directive 75/439/EEC on the disposal of waste oils[8], Directive 2002/96/EC[9] on waste electrical and electronic equipment, Directive 2002/95/EC[10] on the restriction of the use of certain hazardous substances in electrical and electronic equipment), have become effective.

2.2 Unintentional POPs

Of the three unintentionally released POPs listed in Annex C of the Stockholm Convention (PCDD/PCDF, PCB and HCB), PCDD/PCDF are the most well investigated at European level. A European inventory of releases to air, water and land was made in 1999-2000. Against the background of the EU enlargement, the corresponding information was collected in a release inventory for 10 new Member States in 2005 (EU-10, see footnote 2) in view of having a comprehensive picture of the situation in the enlarged EU. In addition, a study on environmental levels and human exposure as regards PCDD/PCDF and PCBs was made in parallel with the release inventory. In general, it was stated that levels of contamination in the environment and humans have declined over the last decade in most of the EU countries due to emission abatement measures. In addition, the study evidenced that environmental and human levels of PCDD/PCDF and PCBs in the EU-10 Member States are equal or lower than in the EU-15 Member States. The studies together with a summarising report can be found at http://ec.europa.eu/environment/dioxin/index.htm.

As regards emission inventories it should be noted that the overall data base on POP releases in Europe is still limited and presents many gaps. Moreover, uncertainties are high as regards emission factors and activity rates. Inventories can therefore only give estimates and indications on major sources and their proportions.

In a recent Commission study (BiPRO, 2006[11] an overview of sources and their magnitudes were made for PCDD/F, PCB, HCB and PAH. Within the limitations of available data it has been attempted to give a picture of the current situation. It has been estimated that in EU 25 some 21 kg I-TEQ of PCDD/PCDF are released per year, of which around 5 kg are air emissions and 16 kg are waste. The main sources for PCDD/PCDF emissions to air are thought to be residential combustion, open burning of waste, wood preservation and iron and steel industry. For unintentionally released PCBs the corresponding figure is at least 5.000 kg/year

[7] OJ L 269, 21.10.2000, p. 34. Directive as amended by Commission Decision 2002/525/EC (OJ L 170, 29.6.2002, p. 81).
[8] OJ L 194, 25.7.1975, p. 23.
[9] OJ L 37, 13.2.2003, p.24.
[10] OJ L 37, 13.2.2003, p. 19.
[11] BiPRO (2006) : Study on "Identification, assessment and prioritisation of EU measures to reduce releases of unintentionally produced/releases persistent organic pollutants" (http://ec.europa.eu/environment/dioxin/index.htm)

total releases, with air emissions accounting for more than 4.000 kg and waste for at least 650 kg. The major sources responsible for releases to air are power generation, road transport and iron and steel industry. Finally, total releases of HCB are estimated to more than 4.000 kg/year, with 3.500 kg to air and 500 kg to waste. The major air emission sources are pesticide use and metal industry. In all cases the releases to water are estimated to be low or insignificant. PAHs are not included in the Stockholm Convention, but are listed in the EU POP Regulation and will therefore to some extent be addressed in this Implementation Plan. The estimated releases are 2.500 ton/year, mainly via emissions to air (2.000 ton) and water (400 ton). The main sources for releases to air are residential combustion, road transport and wood preservation. Again, it should be noted that there are significant uncertainties to these estimates, especially for PCB and HCB and for releases to water for all substances.

The mass flow of PCDD/PCDF has been investigated in another Commission study (BiPRO, 2005). Similar to the study mentioned above, it concludes that this compound class amounts to a dimension of 20 kg/y in Europe with 20% emitted to air and around 80% discharged in the form of solid process residues entering the waste regime. Most important sectors for discharge of PCDD/PCDF via residues are municipal solid waste (35%), municipal solid waste incineration (16.5%), power production (18.6%) and the ferrous metal industry with electric arc furnaces (10.3%) and sinter plants (8.4%).

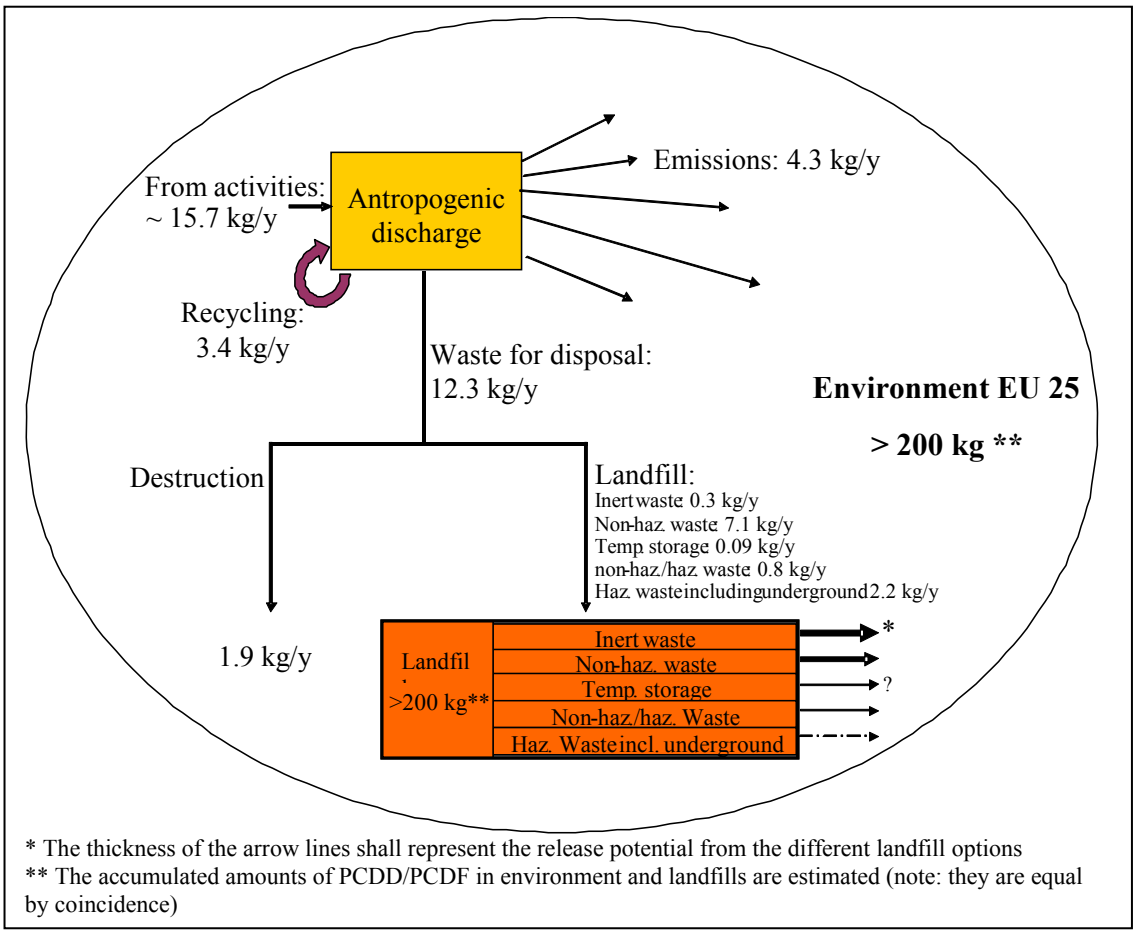

Figure 5. Major pathways and amounts of PCDD/PCDF distributed in EU-25.

The value under "Environment EU 25" is the estimated total amount of PCDD/PCDF currently in the environment of all the EU 25, that is, the total amount that has been spilled to the environment (for all the compartments).

As illustrated in the figure above the PCDD/PCDF flow is characterised by relatively small amounts which are constantly formed and discharged while remarkable stocks awaiting elimination do not exist. As air emissions account for only 20% of the overall discharge from anthropogenic sources the waste sector, which divides into waste disposal operations (63% of the total discharge/y) and recycling and recovery (16% of the total discharge/y) is of considerable importance.

To conclude, the waste sector is important for the overall discharge of PCDD/PCDF, but the major share of PCDD/PCDF discharge via waste will not be covered by the POPs Regulation. The reason for this is the importance of high volume but low contaminated wastes – mainly municipal solid waste, but also bottom ashes, slags, sewage sludge, compost. Further it can be concluded that potentially higher contaminated wastes (such as fly ashes) are already largely directed to hazardous waste landfills or underground. About 2 kg PCDD/PCDF-TEQ/y are contained in wastes that are disposed off or used as secondary construction material at non-hazardous waste landfills and that might be influenced by the POP regulation.

The Directive 1999/31/EC[12] on the landfill of waste prohibits the landfilling of untreated waste and sets reduction targets for biodegradable waste. These measures promote the incineration of combustible fractions. . Therefore the importance of PCDD/PCDF discharge via non hazardous waste landfilling of municipal solid waste will probably decline in future, increasing the importance of the pathway destruction and hazardous waste disposal.

The crucial point in reducing future loadings of unintentional POPs in the environment obviously is to reduce formation. We must develop processes and technologies that avoid POPs being formed or transferred to air, water, soil and waste streams. Such technologies should be introduced, especially at new plants and in connection with major changes to existing ones. Development and improvement of technologies may appropriately be undertaken within the different industrial sectors concerned.

2.3 Emerging POPs

Both international agreements on POPs foresee listing of additional substances in the annexes of substances to be banned, restricted or otherwise controlled. Any Party may propose amendments to this end and criteria and procedure for review of the proposals have been established. The aim of the European Community and the Member States is that further POP substances be included under the international agreements in order to contribute to achieving the 2020 chemicals target adopted at the World Summit on Sustainable Development.

There are two main sources of information that have triggered action on certain emerging POPs. First, the Arctic Council' and other monitoring programmes have revealed information on increasing trends of concentrations of certain new organochlorine and organobromine compounds in remote regions and in biological samples, including human breast milk. Another source is the regulatory and assessment schemes which currently address all pesticides, biocides, new substances and high production volume chemicals.

[12] OJ L 182, 16.7.1999, p. 1..

Altogether 12 new substances have been so far proposed to be added in the Stockholm Convention and/or the UNECE Protocol on POPs (see table 1) and they are thus currently subject to technical review under these agreements. These substances can be broadly divided in two groups, namely those which are or have still recently been produced and widely used in the EU and those which are not known to have been produced or used within the EU for decades, if ever.

The first group consists of commercial pentabromodiphenyl ether (c-pentaBDE), commercial octabromodiphenyl ether (c-octaBDE), Perfluorooctane sulfonate (PFOS), short-chained chlorinated paraffins (SCCPs) and lindane.

c-PentaBDE is a brominated flame retardant that has been widely used in industrialised countries. Norway, supported by the EU, has proposed its inclusion in both the UNECE Protocol on POPs and the Stockholm Convention. The marketing and use of pentaBDE has been phased out in the EU some years ago (Directive 2003/11/EC[13]).

The EU has in 2005/2006 proposed inclusion of c-octaBDE to the UNECE Protocol on POPs and the Stockholm Convention. OctaBDE is a close relative to pentaBDE and the technical mixture contains also pentaBDE and other polybrominated compounds. The marketing and use of octaBDE have been totally banned in 2000's in the EU (Directive 2003/11/EC).

The marketing and use of PFOS and related compounds have recently been restricted in the EU (Directive 2006/122/EC[14]). Production of PFOS has been phased out based on voluntary action by the main United States producer but in certain uses there are not yet suitable alternatives. The EU has proposed PFOS to be listed in the UNECE Protocol on POPs. Sweden has proposed PFOS to be listed in the Stockholm Convention.

SCCPs are industrial chemicals that are severely restricted in the EU (Directive 2002/45/EC[15]). The EU has in 2005/2006 proposed these substances to be listed in the UNECE Protocol on POPs and in the Stockholm Convention

HCH (including lindane) is already listed in the UNECE Protocol on POPs and it has been proposed to be listed in the Stockholm Convention by Mexico, in addition to the α and β isomers of HCH. Lindane has still some minor uses allowed in the EU but it is to be phased out totally by the end of 2007.

The other group of emerging POPs consists currently of chlordecone and hexabromobiphenyl (HBB) both already listed in the UNECE Protocol on POPs and proposed by the EU to be listed in the Stockholm Convention, pentachlorobenzene was proposed by the EU in 2006 to be listed in the Stockholm Convention and in the UNECE Protocol on POPs, and finally hexachlorobutadiene and polychlorinated naphthalenes. The two last mentioned have been proposed to be listed by the EU in the UNECE Protocol on POPs but not in the Stockholm Convention.

Additional substances (e.g., Endosulfan, Dicofol, Trifluralin, pentachlorophenol) that may exhibit POP characteristics and which may warrant regional or global action are currently

[13] OJ L 42, 15.2.2003, p. 45
[14] OJ L 372, 27.12.2006, p. 32
[15] OJ L 177, 6.7.2002, p. 21

under discussion in the EU. In addition, further information is being gathered on some industrial chemicals, e.g. perfluorooctanoic acid (PFOA).

3 Key Community Legislation and Policies related to EU's Obligations under the Stockholm Convention

3.1 Legislative instruments

The main legal instrument for implementing the Stockholm Convention and the UNECE Protocol on POPs in the EU is the Regulation (EC) No 850/2004 . This Regulation entered into force 20 May 2004 and as a regulation it is directly applicable in all Member States, including those which are not yet Parties to the Stockholm Convention or the UNECE Protocol on POPs.

The Regulation bans production, placing on the market and use of the 13 intentionally produced POP substances listed in the Stockholm Convention and the UNECE Protocol on POPs. General and specific exemptions to these prohibitions are limited to a minimum. All remaining stockpiles for which no use is permitted shall be managed as hazardous waste. Stockpiles greater than 50 kg meant for permitted uses shall be notified to the competent authority and managed in a safe, efficient and environmentally sound manner. Holder of a stockpile consisting of or containing any POPs for which no use is permitted shall manage that stockpile as waste generally in such a way that the POP content is destroyed or irreversibly transformed. The Regulation obliges Member States to draw up and maintain comprehensive release inventories for dioxins, furans, PCBs and polyaromatic hydrocarbons (PAH) and to communicate their national action plans on measures to minimise total releases of these substances to the Commission and to the other Member States. The action plan shall also include measures to promote the development of substitute or modified materials, products and processes to prevent the formation and releases of POPs. Producers and holders of waste are obliged to undertake measures to avoid contamination of waste with POP substances. The control measures on waste follow closely those of the Stockholm Convention and provide more details in some aspects. Low POPs concentration limits were adopted through Council Regulation (EC) No 1195/2006[16] amending Annex IV to Regulation (EC) No 850/2004. Waste with POPs content above these limits must generally be disposed or recovered in such a way that the POP content is destroyed or irreversibly transformed. Also the maximum POP concentration limits for those wastes, which are managed in an environmentally preferable way instead of being destroyed or irreversibly transformed, are in the process of being adopted. The Regulation also contains certain general provisions related to the implementation of the Stockholm Convention.

Another important Community instrument is Regulation (EC) No 304/2003[17] concerning the export and import of dangerous chemicals, which implements the obligations of the Rotterdam Convention for the application of the Prior Informed Consent (PIC) procedure for certain hazardous chemicals and pesticides in international trade. It includes the prohibition of export of the 10 POP substances currently listed in the Stockholm Convention, in accordance with the provisions therein.

[16] OJ L 2217, 8.8.2006, p. 1.
[17] OJ L 63, 6.3.2003, p. 1.

A third core legal instrument is the Directive 96/59/EC. This Directive aims at disposing completely of PCBs and equipment containing PCBs as soon as possible, and for equipment with PCB volumes of more than 5 dm³ before the end of 2010. It also sets the requirements for an environmentally sound disposal of PCBs.

It should be mentioned, that considerable parts of Directive 96/59/EC are now substituted by Regulation (EC) No 850/2004. This relates especially to the permanent underground storage of decontaminated PCB-devices and wastes from removed buildings. For both types of waste it will not longer be allowed to dispose them of permanently by underground storage, as Regulation (EC) No 850/2004 exclude this method on contrast to Directive 96/59/EC.

Concerning the obligation to prevent marketing and use of new POP-like chemicals, Council Directive 67/548/EEC[18] on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, Council Directive 91/414/EEC[19] concerning the placing of plant protection products on the market and Directive 98/8/EC[20] concerning the placing of biocidal products on the market are of particular importance. However, production of new substances with POP characteristics cannot be prevented by any of these Directives. This is covered by Regulation (EC) No 1907/2006[21] concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH regulation), and by the revision of the legal frameworks for biocides and plant protection products.

With regard to unintentionally produced POPs, there are several instruments in Community legislation that have an impact, either directly or indirectly, on the reduction of releases of these substances (see Annex 1 for a list of EC legislation on PCDD/F and PCB). The main release control measures are set out in Directive 96/61/EC[22] concerning integrated pollution prevention and control (the IPPC Directive), which covers the major industrial stationary sources of by-product POPs. The European pollutant emission register (EPER), a Community-wide register of the principal industrial emissions to air and water and responsible sources, was established by Commission Decision 2000/479/EC[23]. It covers all of the unintentionally produced POPs listed in Regulation (EC)No 850/2004 (PCDD/F, PCB, HCB and PAH) except PCB. The register will be replaced in reporting year 2007 by the more comprehensive European Pollutant Release and Transfer Register (Regulation (EC) No 166/2006[24]), which will also include reporting of PCB and releases to land and off-site transfers of waste. In the medium to long term, reporting of releases from diffuse sources such as road traffic or domestic heating will also be included.

The Directive 2000/76/EC[25] on the incineration of waste which covers all waste incineration facilities, deals with a very important source of by-product POPs. It should be noted that Directive 2000/76/EC fixes emission limit values of dioxins /furans in air (0.1 ng I-TEQ/m^3)

[18] OJ P 196, 16.8.1967, p. 1. Directive as last amended by Commission Directive 2001/59/EC (OJ L 225, 21.8.2001, p. 1).
[19] OJ L 242, 19.8.1991, p.1. Directive as last amended by Commission Directive 2003/5/EC (OJ L 8, 14.1.2003, p. 7).
[20] OJ L 123, 24.4.1998, p. 1.
[21] OJ L 396, 30.12.2006, p. 1.
[22] OJ L 257, 10.10.1996, p.26.
[23] OJ L 192, 28.7.2000, p. 36.
[24] OJ L 33, 4.2.2006, p. 1.
[25] OJ L 332, 28.12.2000, p. 91.

and water (0.3 ng/l). In addition, the Directive Directive 2001/80/EC[26] on the limitation of emissions of certain pollutants into the air from large combustion plants is relevant from the POPs emissions point of view. Directive 2000/53/EC[27] on end-of life vehicles imposes the segregation of hazardous components from the vehicle before any shredding of the carcass and an adequate disposal of the shredder residues. This would help decrease the releases of POPs from shredder plants, which are considered to be an important source of POPs. The Directives on waste electrical and electronic equipment (WEEE) (Directive 2002/96/EC) and on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Directive 2002/95/EC) establish the mandatory segregation of PCB-containing components to ensure their adequate disposal and the restriction of use of some dangerous substances in electric and electronic equipment. All these directives contribute to reduction of releases of POPs in the environment.

Causing also significant pollution of ambient air, PAHs is the only POP subject to air quality target or limit values in the Community legislation. The Directive 2004/107/EC[28] relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air lays down an air quality target value for benzo[a]pyrene as a marker for PAHs.

Marketing and use of certain chemicals and articles containing PAHs is also regulated by Directive 76/769/EEC. Thus, Benzo(a)pyrene containing creosote preparations are restricted by Directive 2001/90/EC[29] and Directive 2005/69/EC[30] lays down a maximum content of PAHs in extender oils and tyres.

With regard to the prevention of accidental releases of dangerous substances, Council Directive 96/82/EC[31] on the control of major-accident hazards, the so-called Seveso II Directive, is an important piece of Community legislation.

Regarding the releases of POPs to waters, Council Directive 76/464/EEC[32] on pollution caused by discharges of certain dangerous substances has some relevance. Environmental Quality Standards and Emission Limit Values (ELVs) have been set for the POPs aldrin, dieldrin, endrin, HCB (Council Directive 1988/347/EEC[33]), DDT (Council Directive 1986/280/EEC[34]) and HCH (Council Directive 1984/491/EEC[35]). Member States are obliged to set quality standards and prevent pollution for dangerous substances relevant at a national level. The Community controls under Directive 76/464/EEC have been replaced, harmonised and further developed by the Directive 2000/60/EC[36] establishing a framework for Community action in the field of water policy and some of the listed and candidate POPs are included in the lists of priority substances (Decision 2455/2001/EC). Further to Article 16 of Directive 2000/60/EC, the Commission has proposed a Directive setting environmental quality standards in the field

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[26] OJ L 309, 27.11.2001, p. 1.

[27] OJ L 269, 21.10.2000, p. 34. Directive as amended by Commission Decision 2002/525/EC (OJ L 170, 29.6.2002, p. 81).

[28] OJ L 023, 26.1.2005, p. 3.

[29] OJ L 283, 27.10.2001, p. 41.

[30] OJ L 323, 9.12.2005, p.51.

[31] OJ L 10, 14.1.1997, p. 13. Directive as last amended by Commission Decision 98/433/EC (OJ L 192, 8.7.1998, p. 19).

[32] OJ L 129, 18.5.1976, p. 23. Directive as last amended by Directive 2000/60/EC of the European Parliament and of the Council (OJ L 327, 22.12.2000, p. 1).

[33] OJ L 158, 25.6.1988, p. 35.

[34] OJ L 181, 4.7.1986, p. 16.

[35] OJ L 274, 17.10.1984, p. 11.

[36] OJ L 327, 22.12.2000, p. 1.

of water policy. This Directive proposes standards in surface water for 41 substances, including some POPs. There are also provisions in the proposed Directive to verify the reduction of emissions, discharges and losses of priority substances and cessation of discharges, emissions and losses of priority hazardous substances by 2025. In addition, the Directive 2000/60/ECrequires Member States to identify and set standards for pollutants relevant at a river basin level and include this information in their river basin management plans, which are to be prepared by 2009. Member States must also propose programmes of measures in their river basin management plans that are designed to achieve good water status by 2015. These Programmes of Measures must be operational by December 2012 at the latest.

Directive 2006/12/EC[37] on wastes constitutes the legal framework for Community policy on waste management and is of relevance also from the POPs point of view. Directive 91/689/EEC[38] on hazardous waste contains additional management and monitoring obligations for hazardous waste. Transboundary shipments of waste are covered by Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the Community[39]. This Regulation is the main instrument to transpose the Basel Convention into Community legislation. Movements of waste consisting of, containing or contaminated with POP substances are also covered by that Regulation. The type of control depends on the classification of the waste, the destination of the waste and whether it is destined for disposal or recovery. The regulation prohibits the export of all waste for disposal outside the Community. It does not prohibit imports for disposal, but Member States have the ability to impose more restrictive controls if they wish. Hazardous wastes may be traded between OECD (Organisation for Economic Co-operation and Development) countries for recovery or recycling, but may not be sent to non-OECD countries. The controls for such shipments depend on whether the waste is classified as hazardous e.g. lead acid batteries, or highly hazardous, e.g. asbestos[40]. A revised Waste Shipment Regulation has been adopted (Regulation No 1013/2006[41]) and will apply from 12 July 2007.

The Directive 2002/32/EC[42] on undesirable substances in animal feed covers all but one current POPs and most of the POP candidates. Directive 2002/32/EC includes maximum limits for heavy metals such as arsenic, lead, mercury and cadmium as well as for dioxin, aflatoxin, certain pesticides, and botanical impurities in certain feed materials, feed additives and feeding stuffs. In food, maximum levels for POPs are established in the legislation on contaminants and the legislation on pesticide residues. The Council Regulation (EEC) No 315/93 laying down Community procedures for contaminants in food[43] is the framework legislation. Maximum levels are laid down in Commission Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs[44] which concerns very few POPs (dioxins, dioxin-like PCBs and PAH), Maximum residue levels for the pesticide POPs are

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37 OJ L 114, 27.4.2006, p. 9.

38 OJ L 377, 31.12.1991, p. 20. Directive as last amended by Council Directive 94/31/EC (OJ L 168, 2.7.1994, p. 28).

39 OJ L 30, 6.2.1993, p. 1. Regulation as last amended by Commission Regulation (EC) No 2557/2001 (OJ L 349, 31.12.2001, p. 1).

40 The terminology used is: Countries to which the OECD Decision applies. The OECD Decision refers to the Decision of the OECD Council of 30 March 1992 on the control of trans-boundary movements of wastes destined for recovery operations, as amended.

41 OJ L 190, 12.7.2006, p. 1.

42 OJ L 140, 30.5.2002, p.10. Directive as last amended by Commission Directive 2006/77/EC (OJ L 271, 30.9.2006, p. 53)

43 OJ L 37, 13.2.93, p.1

44 OJ L 364, 20.12.2006, p. 5. Regulation replacing Commission Regulation (EC) No 466/2001 (OJ L 77, 16.3.2001, p.1) , as last amended by Regulation (EC) No 199/2006 (OJ L32, 4.2.2006, p. 32)

established in Council Directive 86/362/EEC on the fixing of maximum levels for pesticide residues in and on cereals[45], Council Directive 86/363/EEC on the fixing of maximum levels for pesticide residues in and on foodstuffs of animal origin[46] and Council Directive 90/642/EEC on the fixing of maximum levels for pesticide residues in and on products of plant origin, including fruit and vegetables [47]. These Directives will be repealed and replaced by Regulation (EC) No 396/2005[48] on maximum residue levels of pesticides in or on food and feed of plant and animal origin, six months after the Annexes I, II, III and IV to this Regulation have been established.

3.2 Strategies, policies and programmes

The European Union strategy for sustainable development adopted in 2001 is based on the Communication from the Commission (COM(2001) 264 final) and the Presidency conclusions from the Gothenburg European Council, 15 and 16 June 2001. The strategy addresses, among other things, threats to public health and lists as headline objectives food and chemical safety. One of the concrete actions mentioned in the strategy is to improve capacity to monitor and control health impacts of certain substances, including dioxins, in food and the environment, especially their effects on children. Building on the 2001 strategy the European Council adopted a renewed EU sustainable development strategy in June 2006 (http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf). The renewed strategy still sees threats to public health as an important unsustainable trend to be tackled. Several operational objectives and targets are formulated, including ensuring that by 2020 chemicals, including pesticides are produced handled and used in ways that do not pose significant threats to human health and the environment. Actions include the rapid adoption of REACH, addressing health determinants across all relevant policies and activities and improving coordinated research into the links between environmental pollutants, exposure and health impacts.

The main current strategy document on the Community's environmental policy is the 6th Environment Action Programme for years 2000 – 2010[49] adopted in 2002. The Programme is focusing on certain key areas of concern, environment and health being one of them. This Programme contains also several objectives and actions related to POPs.

The 6th Environment Action Programme (EAP) aims at a high level of quality of life and social well being for citizens by providing an environment where the level of pollution does not give rise to harmful effects on human health and the environment. Related to chemicals, it aims to achieve within one generation (2020) that chemicals are only produced and used in ways that do not lead to a significant negative impact on health and the environment. Moreover, chemicals that are dangerous should be substituted by safer chemicals or safer alternative technologies not entailing the use of chemicals, with the aim of reducing risks to man and the

[45] OJ L 221, 7.8.1986, p.37. Directive as last amended by Commission Directive 2006/92/EC (OJ L 311, 10.11.2006, p. 31)

[46] OJ L 221, 7.8.1986, p. 43. Directive as last amended by Commission Directive 2006/62/EC (OJ L 206, 27.7.2006, p. 27)

[47] OJ L 350, 14.12.1990, p. 71. Directive as last amended by Commission Directive 2006/92/EC (OJ L 311, 10.11.2006, p. 31)

[48] OJ L 70, 16.3.2005, p. 1. Regulation as amended by Commission Regulation (EC) No 178/2006 (OJ L 29, 2.2.2006, p.3)

[49] Decision No 1600/2002/EC. OJ L 242, 10.9.2002.

environment. Impacts of pesticides on human health and the environment should be reduced and pesticides in use which are persistent or bio-accumulative or toxic or have other properties of concern should be substituted by less dangerous ones where possible.

One of the actions of the 6th EAP is to develop and implement seven thematic strategies: Soil protection; Protection and conservation of the marine environment; Sustainable use of pesticides; Air pollution; Urban environment; Sustainable use and management of resources; Waste prevention and recycling. Especially the four first mentioned strategies are of relevance to the work on elimination of POP pollution. For example, the proposed Marine Strategy Directive addresses toxic contamination caused by pollutants such as POPs and the Air Pollution Strategy even if it does not directly deal with air pollution caused by POPs, the proposed measures are likely to reduce also the emissions of by-product POPs. The seven thematic strategies are published (http://ec.europa.eu/environment/newprg/strategies_en.htm).

In 2001, the Commission adopted a Communication on a Community Strategy for Dioxins, Furans and Polychlorinated Biphenyls (COM(2001) 593 final)) as a response to a number of serious feed and food contamination incidents. This strategy aims to assess the current state of the environment and the ecosystem, to reduce human exposure to dioxins and PCBs in the short-term, to maintain human exposure at safe levels in the medium to long term and to reduce environmental effects from dioxins and PCBs. No legislative changes are proposed in the strategy, but several other measures, including proper enforcement of the current Community legislation (in particular the Directive 96/59/EC and the IPPC Directive), are proposed. As such the strategy forms a Community-wide action plan to reduce and eliminate releases of these POPs. The measures to reduce human exposure in the short term include legislation setting limit values for the presence of dioxins, furans and dioxin-like PCBs in feed and food. In order to avoid new releases and address already existing contamination in the environment the Strategy proposes measures to identify sources, control emissions and control the quality of the environment. The Strategy also highlights the need for research, communication to the public and the establishment of a common methodology for continuous monitoring. A review of the actions relating to the environment proposed in the Strategy is being made in the new context of the implementation of the POPs Regulation.

In June 2004, the Commission launched an Environment and Health Action Plan presenting an integrated approach involving closer coordination between the health, environment and research areas. Its added value is the development of a system for integrated information on environment and health to render the assessment of the environmental impact on human health more efficient. To this end, it also proposes to develop a coordinated approach to human biomonitoring between the Member States. Moreover, there are also research actions focused on understanding health impacts of chemicals (including endocrine-mediated and neurotoxic effects). These initiatives will result in better knowledge on human exposure to environmental stressors, including POPs. Research activities implementing the Environment and Health Action Plan can be found at http://ec.europa.eu/research/environment/pdf/env_health_en.pdf and http://ec.europa.eu/research/environment/pdf/urb_sust_better_en.pdf. Over €200M have been spent by the EU on research actions implementing the Action Plan up to 2007. It is also worth mentioning the Community Strategy for endocrine disrupters, which was adopted in 1999 in order to address the problem of endocrine disrupters of implementing by mean of short, medium and long-term actions (http://ec.europa.eu/environment/endocrine/index_en.htm). Under this strategy, a list of priority substances for evaluation (including some POPs) has been elaborated. Research and communication activities have also been carried out

(http://ec.europa.eu/research/endocrine/index_en.html). Final reports of many projects can be found at http://ec.europa.eu/research/quality-of-life/ka4/ka4_reports_en.html.

In 2001, the European Commission adopted a White Paper setting out the strategy for a future Community Policy for Chemicals[50]. The main objective of the new Chemical Strategy is to ensure a high level of protection for human health and the environment, while ensuring the efficient functioning of the internal market and stimulating innovation and competitiveness in the chemical industry. The Strategy pays special attention on substances of concern which include persistent, bio-accumulating and toxic substances (PBT) and very persistent and very bio-accumulating substances (vPvB). The White Paper was followed-up in 2003 by a Commission proposal for a new EU regulatory framework for chemicals[51].The REACH Regulation has been adopted in December 2006. Under the REACH Regulation companies that manufacture or import more than one tonne of a chemical substance per year would be required to register it in a central database. Substances of very high concern (including PBT and vPvB substances) would require authorisations for particular uses from the Commission. REACH would furthermore give greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. This information would be passed down the chain of production. The REACH Regulation aims at increasing knowledge of the properties of chemicals and of the exposure and to improve the risk management of chemicals. It will also contribute to identification and control of substances exhibiting characteristics of POPs.

In 2001 the European Commission adopted a Strategy on Integrating the Environment into EC Economic and Development Cooperation. The Environment integration strategy outlines how, in the overall context of poverty reduction, EC economic and development co-operation can best assist developing country partners to respond to the environmental challenges they are facing. This includes supporting specific environmental initiatives, and integrating the environment into all existing instruments and programs. At the policy level, this means exploiting synergies between poverty reduction and the environment. Improved policy coherence with fields such as trade, agriculture, fisheries and transport and energy is critically important. At an operational level, improved dialogue with partner countries during the programming of country and regional assistance provides opportunities to integrate environmental considerations into development co-operation to eliminate risks for human health and the environment caused by POPs.

A special emphasis is given to the strengthening of institutional capacities of partner countries, in order to facilitate their participation in multilateral fora dealing with the environment and to implement Multilateral Environmental Agreements (MEAs).

As an example, the recently adopted Communication from the Commission on EU Strategy for Africa (Towards a Euro-African pact to accelerate Africa's development)[52] lists the support for the sound management of chemicals, by building capacity to manage risk, by protecting human health and environment and by implementing the international chemicals conventions, among its actions.

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50 COM(2001) 88 final.
51 COM(2003) 644 final.
52 COM(2005) 489 final.

3.3 Financial instruments

The European Union provides significant amount of funding to environmental projects and programmes, both within the EU, in neighbouring countries and in the developing countries. There are several financial instruments and programmes that can be relevant also for POP related projects. All these instruments are described in a recently published Handbook for Environmental Project Funding.

Launched in 1992, LIFE (The Financial Instrument for the Environment) is the main financial instrument for the Community environment policy. LIFE co-finances environmental initiatives in the European Union and certain third countries bordering on the Mediterranean and the Baltic Sea, and in those EU candidate countries that have decided to participate. The third phase of the LIFE programme ran for a five year period (2000-2004). Its budget was to EUR 640 million. In September 2004 with the publication of Regulation (EC) No 1682/2004[53], LIFE III was extended for a further two years (2005 and 2006), with an additional budget of EUR 317 million. In the same context, the European Commission adopted a proposal for a new phase of LIFE, to be known as LIFE+, for the period 2007-2013. This proposes a budget of 1 854 million € for the seven year period, and a simplified structure for the programme involving three components:

- LIFE+ nature and biodiversity.
- LIFE+ environment policy and governance - LIFE+ information and communication.

The thematic priorities of the programme support the priorities of the Sixth Environmental Action Programme, one of them being environment and health. In total, between 1992 and 2004, the LIFE programme spent €1.36 billion on 2478 projects covering 40 countries and territories. The total estimated cost of projects to which LIFE contributed financially represents a huge environmental investment in Europe and neighbouring states. Between 1992 and 2004 the total estimated cost of projects supported by LIFE was €3.6 billion. LIFE therefore provided around 38 percent of the total investment, stimulating additional investment in excess of €2 billion up to the end of 2004. LIFE programme has co-financed projects relevant for the POPs pollution control, both within the EU and in the neighbouring countries (see examples in Annex II).

In future, the projects in third countries are, however, not to be financed through LIFE but other funds. The candidate and acceding countries have specific financial programmes. The PHARE programme is one of the three pre-accession instruments financed by the European Communities to assist the candidate countries of Central and Eastern Europe in their preparations for joining the European Union. In 2000 - 2006, PHARE is providing some €11 billion of co-financing for institution building support through "twinning" and technical assistance and for investment support to help candidate countries in their efforts:
- 1. To strengthen their public administrations and institutions to function effectively inside the EU;
- 2. To promote convergence with the European Community's extensive legislation and reduce the need for transition periods;
- 3. To promote economic and social cohesion.
The Technical Assistance and Information Exchange (TAIEX) Instrument of the Institution Building unit of Directorate-General Enlargement of the European Commission aims to provide to the New Member States, acceding countries, candidate countries, and the

[53] OJ L 308, 5.10.2004, p. 1

administrations of the Western Balkans, short-term technical assistance, in line with the overall policy objectives of the European Commission, and in the field of approximation, application and enforcement of EU legislation. Assistance is also provided to those countries included in the EU's European Neighbourhood Policy, as well as Russia.

For the period covered by the next Financial Perspectives (2007-2013), pre accession assistance will be streamlined under the future Instrument for Pre accession Assistance IPA, which will replace the PHARE and other specific instruments.

The TACIS Programme provides grant-financed technical assistance to 12 countries of Eastern Europe and Central Asia and mainly aims at enhancing the transition process in these countries.

The MEDA programme is the principal financial instrument of the European Union for the implementation of the Euro-Mediterranean Partnership. The programme offers technical and financial support measures to accompany the reform of economic and social structures in the Mediterranean partners and it is implemented by DG EuropAid. For the period 2000-2006 €5,350million have been allocated to these countries.

SMAP (the Short and Medium-term Priority Environmental Action Programme) is a framework programme of action for the protection of the Mediterranean environment, within the context of the Euro-Mediterranean Partnership.

For the period covered by the next Financial Perspectives (2007-2013), pre accession assistance will be streamlined under the future European Neighbourhood Policy Instrument (ENPI) for the European Neighbourhood Policy countries, thus replacing MEDA and TACIS.

The EU Development Cooperation is based on partnership with developing countries and nationally-owned strategies developed in Country Strategy Papers (CSPs) and Regional Strategy Papers (RSPs). Thus, EC funding for the environment usually takes place within this context, i.e. assistance is given to those countries and regions that have prioritized and requested such assistance within their CSPs/RSPs. Funding for the environment can also be allocated under multi-regional instruments, for example for the African, Caribbean and Pacific (ACP) countries. The Thematic Programme Environment and Natural Resources, including Energy (ENRTP) is designed to assist developing countries to integrate environment into their development processes. It replaces starting in 2007 the Environment and Tropical budget line. Environment projects in third countries that relate to research are financed under the Research budget of the EC.

3.4 Research and Development

The EU promotes research programmes, funds joint projects and is working to ensure the most efficient use of resources across Europe. The Framework Programme (FP) is the European Union's main instrument for funding research and development. The FP is proposed by the European Commission and adopted by the Council and the European Parliament following a co-decision procedure. FPs have been implemented since 1984 and cover a period of five years with the last year of one FP and the first year of the following FP overlapping. The goals of the successive FPs have always been to promote a strong, competitive European industry and to improve the quality of life of European citizens. High-quality research and an effort to

maximise the added value of trans-national co-operation are the pillars of this endeavour. The Joint Research Centre (JRC) was set up as part of the European Commission when the EU was founded in 1958. The JRC's task was to provide independent scientific advice and technical support to the Commission and other EU institutions when drafting and implementing policy. Today, particularly relevant for the POPs implementation are activities of the Institute for Environment and Sustainability, the Institute for Prospective Technological Studies (in particular of the European IPPC Bureau) and the Institute for Health and Consumer Protection.

In the 1980s, the EU took on a broader responsibility for stimulating and coordinating scientific research in its Member States. Environment has since the 1990's been one of the main themes among the EU research activities, which are defined and implemented through the multi-annual FPs. The successive FPs reflect the constantly changing nature of scientific and technological research and the Union's evolving priorities.

The current framework programme, the seventh, runs from 2006 until 2013 and has a budget of €50.5 billion over the full period. The themes 'Food, agriculture and fisheries, and biotechnology' (€1.94 billion) and 'Environment including climate change' (€1.89 billion) in particular will support research on POPs. However, a vast majority of the the projects funded under the Sixth Framework Programme (FP6 – 2002-2006) are currently ongoing. POPs-related projects were funded by the 'Food quality and Safety' (http://cordis.europa.eu/food/) and the 'Global change and ecosystems' (http://cordis.europa.eu/sustdev/environment/home.html) thematic priorities.

Part II – IMPLEMENTATION PLAN

4 Policy statement

The European Community as a Party to the Stockholm Convention and the UNECE Protocol on POPs is fully committed to the effective implementation and further development of these two international legally binding instruments. As these instruments cover wide range of control measures and supporting activities, both the Community and all Member States need to ratify and take action on issues falling under their respective competences. In most of the issues proper implementation and enforcement cannot be ensured without close and constructive cooperation between the Commission and the Member States.

Matters belonging to the exclusive Community competence include issues where total harmonisation of internal market and measures related to international trade are required (prohibitions and restrictions of production, export, import, placing on the market and use of intentionally produced POP substances). On such issues the responsibility of initiating appropriate implementation legislation lies in the Commission. Enforcement of the Community measures remains as a responsibility of the each Member State.

In addition, the Community has shared competence in several other fields covered by the Community environment legislation. In those fields the Commission has the right to initiate additional legislative and other measures which may complement or replace national legislation.

Legislative measures alone are not sufficient for proper implementation of the international obligations. The Commission is fully committed to ensure that other necessary Community measures are put in place and enforced. This includes the necessary financial commitments by the Community to assist the developing countries and countries with economies in transition, as required by the Stockholm Convention.

5 Implementation of the basic obligations of the Stockholm Convention

5.1 Elimination of intentional production and use of POPs (Article 3(1))

5.1.1 POP pesticides and HCB

Obligations: Article 3, paragraph 1(i): prohibit and/or take legal or administrative measures necessary to eliminate the production and use of aldrin, dieldrin, chlordane, endrin, heptachlor, mirex, toxaphene and HCB.

Implementation so far: Production, placing on the market and use of aldrin, dieldrin, chlordane, endrin, heptachlor, mirex, toxaphene and HCB as such, in preparations or in articles prohibited fully by Regulation (EC) No 850/2004. No country specific exemptions are allowed in the EU.

Analysis: Legal measures are considered comprehensive. There is no need for further legislative measures at Community or Member State level as the Regulation is directly applicable legislation in all EU-Member States.

Border and market surveillance by the Member States remains to be necessary. Cases of non-compliance need to be reported to the Commission.

5.1.2 PCBs

Obligations: Article 3, paragraph 1(i), Annex A, Part II: prohibit and/or take legal or administrative measures necessary to eliminate the production and use of PCBs.

Implementation so far: Production, placing on the market and use of PCBs as such and in preparations is prohibited fully by Regulation (EC) No 850/2004.

Articles containing PCBs already in use are covered by specific provisions laid down in Directive 96/59/EC. Directive 96/59/EC aims for the approximation of the laws of the Member States on the controlled disposal of PCBs, the decontamination or disposal of equipment containing PCBs and/or the disposal of used PCBs in order to eliminate them completely. According to the Directive, Member States must take the necessary measures to ensure that used PCBs are disposed of and that PCBs and equipment containing PCBs are decontaminated or disposed of in an appropriate manner.
Member States are obliged to compile inventories of equipment with PCB volumes of more than 5 dm^3. These inventories where to be sent to the Commission by September 1999 at the latest. The equipment and PCBs contained in the inventories must be decontaminated or disposed of by 2010 at the latest. The inventories must supply the following data:

- the names and addresses of the holders;
- the location and description of the equipment;
- the quantity of PCBs contained in the equipment;
- the date and type of treatment planned;
- the date of the declaration.

Moreover, the Directive stipulates that any equipment which is subject to inventory must be labelled.

Member States must prohibit the separation of PCBs from other substances for the purpose of reusing the PCBs and the topping-up of transformers with PCBs.

Concerning the appropriate waste management, Member States must take the necessary measures to ensure that:

- PCBs, used PCBs and equipment containing PCBs which is subject to inventory are transferred to licensed undertakings, at the same time ensuring that all necessary precautions are taken to avoid the risk of fire;
- any incineration of PCBs or used PCBs on ships is prohibited;
- all undertakings engaged in the decontamination and/or the disposal of PCBs, used PCBs and/or equipment containing PCBs obtain permits;
- transformers containing more than 0.05% by weight of PCBs are decontaminated under the conditions specified by the Directive.

In accordance with the committee procedure referred to in Directive 75/442/EEC[54], the Commission:

- must fix the reference methods of measurement to determine the PCB content of contaminated materials[55];
- may fix technical standards for the other methods of disposing of PCBs;
- must make available a list of the production names of capacitors, resistors and induction coils containing PCBs;[56]
- will determine, if necessary, other less hazardous substitutes for PCBs.

Within three years following the adoption of Directive 96/59/EC, Member States had to draw up plans for the decontamination and/or disposal of inventoried equipment and the PCBs contained therein and plans for the collection and subsequent disposal of equipment not subject to inventory.

Analysis: Legal measures on production, marketing and new use of PCBs (and PCTs) are comprehensive and there is no need for further legislative measures at Community or Member State level as the Regulation is directly applicable legislation in all EU-Member States.

Directive 96/59/EC address the main existing PCB uses and lay down a clear timetable for specific, most important control actions. However, the Directive does not specifically address all PCB containing articles, e.g. small capacitors or open uses of PCBs in construction.

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[54] OJ L 194, 25.7.1975, p. 39.

[55] This task has been addressed by Commission Decision 2001/68/EC establishing two reference methods of measurement for PCBs pursuant to Article 10(a) of Council Directive 96/59/EC .

[56] In 2001 the Commission has drawn up a list and made it available to the Member States

In the end of the 1990's the Commission has launched infringement proceedings against the EU-15 countries to ensure their obligation to send to the Commission

- Summaries of their inventories of equipment with volumes > 5 dm^3,
- Plans for the disposal and/or decontamination of inventoried equipment and the PCBs contained therein and
- Outlines for the collection and subsequent disposal of equipment which is not subject to inventory.

After the required documents have been provided by the Member States most of the cases were closed. For Greece the Commission is still examining whether the received information constitutes a disposal/decontamination plan in the meaning of the Directive.

For the EU-10 Member States the Commission has launched similar infringement proceedings in 2005, except for Slovenia, where the preparing analysis is still ongoing. The documents which in the meantime have been sent to the Commission show that the elaboration of the inventories, plans and outlines is progressing in these countries. This may not preclude that the Commission will continue the infringement proceedings where the necessary documents are not delivered in time or not in line with the requirements laid down in the Directive.

Action 1: *Commission to launch or continue infringement proceedings against the Member States in cases of non-compliance.*
Timeline: Infringement proceedings: continuous.

The inventories once notified to the Commission are becoming obsolete because their completion normally requires an iterative approach. Also since their notification time has elapsed and the disposal of PCB has been or is being carried out. In order to ensure the compliance with the forthcoming disposal deadline of 2010 the inventories should be reviewed with the aim to ensure their completeness and compliance with the disposal deadline.

Action 2: *Commission to review PCB Member States inventories and compliance with deadline to dispose of inventoried equipment launch or continue infringement proceedings against the Member States in cases of non-compliance.*
Timeline: 2010

5.1.3 DDT

Obligations: Article 3(1)(ii): Take measures necessary to restrict the production and/or use of DDT, in accordance with the provisions of Annex B, Part II (production and use for disease vector control and intermediate use specifically allowed).

Implementation so far: Production, placing on the market and use of DDT as such, in preparations or in articles is totally prohibited by Regulation (EC) No 850/2004.

On the basis of note (iii) of Annex B, Part I, of the Stockholm Convention, the Regulation grants an exemption for Spain to continue the existing manufacture of dicofol using DDT as site-limited, closed-system intermediate until 2014. This use is to be reviewed by the Commission by the end of 2008. It should be noted that Council Directive 90/533/EEC[57] bans

[57] OJ L 296, 27.10.1990, p. 63.

Dicofol containing less than 78 % of p.p.1-dicofol or more than 1 g/kg DDT and DDT related compounds.

Analysis: Legal measures on production, marketing and use of DDT are comprehensive and there is no need for further legislative measures at Community or Member State level as the Regulation is directly applicable legislation in all EU-Member States. Border and market surveillance by the Member States remains necessary.

Surveillance of the plant producing dicofol by Spain and surveillance of the DDT contamination in dicofol products is necessary; cases of non-compliance need to be reported to the Commission.

When dicofol exemption is reviewed by Commission by 2008, the outcome of the risk assessment of dicofol under Directive 91/414/EEC and other available information concerning the acceptability of the exemption will have to be taken fully into account. If necessary, the Commission should propose deletion or further conditions for this remaining use.

Action 3: *Commission to review the exemption of use of DDT in dicofol production in light of all available information on risks of dicofol and DDT contamination caused by this use.*

Timeline: By the end of 2008.

5.2 Elimination of import and export of POPs (Article 3(2))

Obligations: Article 3(1) and (2): Prohibit and/or take legal or administrative measures necessary to eliminate the import and export of chemicals listed in Annex A of the Stockholm Convention.

Article 3(2) (a) and (b): Take measures regarding the import and export of chemicals listed in Annex B of the Stockholm Convention.

Implementation so far: Import is regarded as placing on the market in the EU and thus import of all Annex A and B chemicals is prohibited by Regulation (EC) No 850/2004. **Export** of all Annex A and B chemicals is explicitly prohibited by Regulation (EC) No 304/2003.

Analysis: The existing legal measures on import and export cover the obligations laid down in the Stockholm Convention. The above mentioned regulations are directly applicable legislation in all EU-Member States.

To enforce the legislation, effective border control by Member States is a necessity. This may benefit from individual tariff codes for the listed POP chemicals.

Action 4: *Commission to investigate the possibility to initiate international work on development of individual tariff codes for POP substances.*

Timeline: By the end of 2008.

5.3 Prevention of the production and use of new chemicals exhibiting characteristics of POPs (Article 3(3))

Obligation: Article 3(3): Take measures to regulate with the aim of preventing the production and use of new chemicals and pesticides which, taking into consideration criteria in Annex D of the Stockholm Convention, exhibit the characteristics of persistent organic pollutants.

Implementation so far: Article 3(3) of Regulation (EC) No 850/2004 repeats the provision of the Stockholm Convention but the practical implementation is left to be done in the framework of the existing Community regulatory and assessment schemes for industrial chemicals, plant protection products and biocides. Council Directive 67/548/EEC (new substances), Council Directive 91/414/EEC (plant protection products) and Directive 98/8/EC (biocidal products) of the European Parliament and of the Council are in this regard of particular importance.

Analysis: While the placing on the market of POP like substances can in principle be effectively prevented within the existing regulatory frameworks for chemicals, production of new substances with POP characteristics cannot be prevented by any of these Directives. This is to be covered by the Regulation (EC) No 1907/2006 (REACH Regulation) adopted in December 2006. Although there are tonnage triggers for registration below which the data submitted to the authorities will not necessarily be sufficient for POP assessment, the REACH Regulation will address specifically substances of very high concern, like substances with a high bio-concentration potential and highly persistent and toxic, through its system of authorisation that does not have any tonnage trigger. The European Chemicals Agency will have a right to request further information from companies if it suspects that a substance might exhibit POP characteristics.

As plant protection products and biocides will remain regulated under specific legislation, it would be better from the legal clarity point of view to incorporate the obligation of the Stockholm Convention in the legal acts establishing these regulatory frameworks. This can be done in the context of the revision of the legal acts.

Proper enforcement of the obligation will require concerted action by the industry, rapporteur Member States, other Member States, the Commission and the European regulatory Agencies involved in the risk assessment of chemicals.

Action 5: *Incorporate the obligation to the new legal act on placing on the market of the plant protection products (Directive 91/414/EEC).*

Timeline: Commission proposal to be discussed in 2007[58].

Action 6: *Commission to propose the incorporation of the obligation to the revised Directive 98/8/EC on biocidal products.*

Timeline: By end of 2008.

[58] http://ec.europa.eu/food/plant/protection/evaluation/com2006_0388en01.pdf.

Action 7: *Commission and Member States to ensure that all players (including industry) are fully informed about the obligation of the Stockholm Convention and that the POP assessment is properly incorporated in the assessment of chemicals.*

Timeline: Continuous (e.g., REACH implementation).

5.4 Assessing and controlling chemicals in use (Article 3(4))

Obligation: Article 3(4): Take into consideration within assessment schemes for pesticides and chemicals in use, the criteria in Annex D when conducting assessments of pesticides and chemicals.

Implementation so far: Article 3(3) of Regulation (EC) No 850/2004 not only repeats but strengthens the provision of the Stockholm Convention: It requires the Commission and the Member States to take "appropriate control measures" on existing chemicals and pesticides exhibiting POP characteristics. As in the case of new chemicals (see 5.3), the practical implementation is left to be done in the framework of the existing Community regulatory and assessment schemes for industrial chemicals, plant protection products and biocides.

Analysis: From the Stockholm Convention's legal implementation point of view, the legislative measures taken by the Community can be regarded as fully sufficient. As in the case of new chemicals, from the legal clarity point of view it would be better to incorporate the obligation of the Stockholm Convention in the legal acts establishing the specific regulatory frameworks.

The distinction of new and existing substances is not anymore regarded fully justified within the Community. This change is reflected in REACH Regulation and is likely to be reflected also in the regulatory frameworks set up for plant protection products and biocides when the extensive review programmes on the existing active substances have been accomplished.

Action 8: *Commission to incorporate the obligation to the legal frameworks on plant protection products and biocides with a view of minimising the difference in treatment of existing and new active substances.*

Timeline: See actions 4 (i.e., proposal for a new regulation on plant protection products) and 5.

Action 9: *Commission and Member States to ensure that all players (including industry) are fully informed about the obligation of the Stockholm Convention and that the POP assessment is properly incorporated in the assessment of existing chemicals and active substances with a view of minimising the difference in treatment of existing and new active substances.*

Timeline: Continuous (e.g., REACH implementation).

5.5 General exemptions

Obligations: Article 3(5): Not to apply prohibitions and restrictions to quantities of a chemical to be used for laboratory-scale research or as a reference standard. Notes (i)-(ii) of Annexes A and B: Quantities of a chemical occurring as unintentional trace contaminant in products and

articles or occurring as constituents of articles manufactured or already in use before or on the date of entry into force of the relevant obligation are exempted from the prohibitions / restrictions.

Implementation so far: Article 4(1) and (2) of Regulation (EC) No 850/2004 lay down the general exemptions. Member States are obliged to notify all articles containing any of the listed substances as constituents to the Commission, who in turn will notify the Secretariat in line with note (ii) of Annexes A and B. So far no such articles have been identified by the Member States.

Analysis: The legal actions are sufficient and no further legal measures are needed. Border and market surveillance by the Member States is necessary and cases of non-compliance need to be reported to the Commission.

Obligations: Note (iii) of Annex B: A Party may, upon notification to the Secretariat, allow the production and use of quantities of DDT as a closed-system site limited intermediate that is chemically transformed in the manufacture of other chemicals that do not exhibit the characteristics of POPs.

Implementation so far: As described in chapter 5.1.3, Regulation (EC) No 850/2004 allows the existing plants to continue the production and use of DDT as closed-system site-limited intermediate in the production of dicofol. Only known producer of dicofol in the EU is one plant in Spain.

Analysis: The exemption on DDT is fully in line with note (iii) of Annex B of the Stockholm Convention. However, the Regulation foresees a review by the end of 2008. The Commission has not been informed whether Spain has notified this production and use to the Stockholm Convention Secretariat in accordance with note (iii) of Annex B.

5.6 Country-specific exemptions

Obligations: Article 3(6): Any Party that has a specific exemption in accordance with Annex A or a specific exemption or an acceptable purpose in accordance with Annex B shall take appropriate measures to ensure that any production or use under such exemption or purpose is carried out in a manner that prevents or minimizes human exposure and release into the environment.

Implementation so far: Regulation (EC) No 850/2004 does not allow any country-specific exemptions for the currently listed POP substances and therefore the specific provisions concerning these exemptions do not apply to the Community or the Member States.

Analysis: The legal actions are fully sufficient and no further measures are needed.

5.7 Reduction of total releases from unintentional production

Obligations: (Article 5) To reduce the total releases of the chemicals listed in Annex C (PCDD/F, PCB and HCB) with the goal of continuing their minimisation and, where feasible, achieving their elimination; To develop an action plan to identify, characterise and address the

releases of by-product POPs; To promote the application of available, feasible and practical measures to achieve a reasonable level of release reduction or source elimination and to promote the development and require the use of materials, products and processes to prevent the formation and release of chemicals listed in Annex C; To promote and require the use of best available techniques (BAT) and best environmental practices (BEP) to prevent the release of chemicals listed in Annex C by May 2008 for new sources in main source categories; To promote the use of BAT and BEP for existing sources from the main source categories as well as other categories.

Implementation so far: Article 6 of Regulation (EC) No 850/2004 on POPs addresses substances for which releases should be reduced and minimised, with a view to eliminate them if feasible. The four substances or groups of substances concerned are PCDD/F, PCBs, HCB and PAHs, as listed in Annex III of the Regulation. Of these, the three first mentioned are listed in the Stockholm Convention and are therefore the main focus for the present implementation plan.

At EU level, the Strategy for dioxins and PCBs includes actions in the area of feed and food contamination and actions related to the environment, including release reduction. Over the past decade, important legislation has been adopted to reduce the emissions of PCDD/F, in particular in the areas of waste incineration and integrated pollution prevention and control, resulting in decreasing levels in the environment and in the human population[59].

Analysis and further actions: Under the obligations of the Stockholm Convention, the EU Member States have set up or are setting up their own National Implementation Plans, including National Action Plans to reduce or eliminate releases from unintentional production. In order to avoid duplication of efforts, Community action in this area should therefore only be taken if it can usefully supplement national action and if it presents an EU added value. In view of identifying the most appropriate measures, the European Commission has carried out a study to investigate the current situation and the scope for further measures at European level[60].

Considering the difficulties with data comparisons, data gaps and high uncertainties it has not been possible to generate a complete scientifically accurate inventory for EU-25, but it has been attempted to have a first indication of dimensions and proportions of different sources. Bearing this in mind, together with the fact that there are large variations between the Member States, it is confirmed by the study that in general domestic sources seem to be increasingly important contributors to total POP emissions to air. Such sources include residential heating with wood and coal, and the malpractice of open burning of waste. As for industrial sources, the iron and steel industry still seems to be responsible for relatively high emissions.

The data gaps and data uncertainties highlight the need for more work on emission factors and inventories. Uncertainties are especially high for releases to water, but these releases are understood to be comparatively low. In the case of PCDD/F, waste is thought to be the dominant pathway for releases to the environment, and may outweigh emissions to air by a factor of two or more. For the other POPs, air emissions are likely to be dominating. Waste is specifically addressed below in section 5.8, and the actions in the present section focus on emissions to air.

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[59] As shown for example by the WHO studies of human milk, referred to in the study "Dioxins and PCBs: Environmental levels and human exposure in Candidate Countries", page108.

[60] "Identification, assessment and prioritisation of EU measures to reduce releases of unintentionally produced/released POPs". http://ec.europa.eu/environment/dioxin/index.htm

Based on the information gathered in this investigation and consultation with stakeholders, including Member States, a set of actions has been identified with the objective to contribute to better knowledge on sources and to address already known industrial and non-industrial sources in a proportionate way, keeping in mind the principle of subsidiarity. Many of the actions are already ongoing or planned under existing policies like the IPPC Directive or the EU Dioxin Strategy, but have in some cases been given particular focus to better implement the Stockholm Convention.

Addressing industrial sources

At EU level, releases of POPs from industrial installations are mainly regulated by the IPPC Directive and Directive 2000/76/EC, the former requiring Member States to establish permit conditions based on BAT for a wide variety of industry sectors, and the latter setting maximum permissible limit values for PCDD/F emissions to air and water for the specific activities of waste incineration and co-incineration. PCDD/F are also specifically mentioned in annex III of the IPPC Directive in the indicative list of main polluting substances to be taken into account if they are relevant for fixing emission limit values. The proper and timely implementation and enforcement of the IPPC Directive remains a key priority in order to ensure the necessary reduction of emissions from major industrial sources, including POPs. The Commission has therefore established in 2005 an Action Plan[61] in order to support and better monitor the progress made by Member States in order to ensure the full implementation of the Directive for all installations by its deadline of 30 October 2007.

Action 10: *Commission to continue to support and monitor the implementation of the IPPC Directive in view of the deadline for existing installations of 30 October 2007.*

Timeline: 2007

The permit conditions including emission limit values under the IPPC Directive must be based on BAT, as defined in the Directive. To assist in the determination of what is BAT, the Commission organises an exchange of information between experts from the EU Member States, industry and environmental organisations. This work is co-ordinated by the European IPPC Bureau of the Institute for Prospective Technology Studies at the EU Joint Research Centre in Seville, Spain. The work results in the adoption and publication by the Commission of the BAT Reference Documents (BREFs)[62]. These documents exist for various industrial sectors and for horizontal issues. Co-operation between the BAT information exchange and other international institutions developing guidelines in corresponding areas is endeavoured. Technologies to prevent the formation and release of POPs are also addressed.

Currently all 31 BREFs have been completed. 25 BREFs have been adopted by the Commission. Six more will be adopted shortly. In order to guarantee that technical developments are taken into account, the BREFs are being regularly updated. A process to review and update some adopted BREFs has already started. In the area of POPs, examples of relevant BREFs are iron and steel, ferrous and non-ferrous metals, paper and pulp production, cement and lime production, waste incineration, smitheries and foundries and large combustion plants (all adopted). Of those, reviews are ongoing on the cement and lime BREF, the paper

[61] See report of the Commission on the implementation of the IPPC Directive [COM(2005)540 final]. More information on the Action Plan: http://europa.eu.int/comm/environment/ippc/ippc_implementation.htm

[62] http://eippcb.jrc.es/pages/FActivities.htm

and pulp BREF and the iron and steel BREF. The process to review the BREFs on ferrous and non-ferrous metals is planned to start in 2007. For the review of the iron and steel BREF, the Commission will take into account the outcome of a study finalised in 2005 on the monitoring of dioxin emissions from the metal industry[63]. The study highlighted that big variations exist in the way dioxin emissions are monitored in the Member States and concluded that there is a need to strengthen the measurement of dioxins emitted by this sector.

Action 11: *Commission, Member States, industry and environmental NGOs to give special attention to inclusion of extensive information on the prevention of the formation and control of POP releases in the context of the review of the Best Available Techniques Reference documents.*

Timeline: Continuous

A process to review the IPPC Directive is ongoing with the objective of evaluating the scope to improve the functioning of the Directive and respond to concerns related to better regulation and interaction with other legislation. The outcome of the review process is foreseen by the end of 2007 and could include, if appropriate, a proposal to amend the IPPC Directive and other related industrial emissions legislation. In this context it is being evaluated whether there might be scope for extending the Directive to apply to small combustion installations, i.e. installations below the current threshold of 50 MW, as discussed in the Thematic Strategy on Air Pollution[64]**.** In the assessment a number of pollutants are being looked at, including CO_2, SO_2, NOx, particulate matter and POPs.

Action 12: *Commission to evaluate the scope for bringing small combustion installations (20-50 MW) under the IPPC Directive in the framework of the review process.*

Timeline: 2007

Council Directive 2000/76/EC on the incineration of waste includes limit values for PCDD/F for releases to water and air, applying to both waste incineration and co-incineration. It also includes monitoring requirements for these pollutants, which at present are to be measured once or twice per year (depending on the emission level relative to the limit value). A review of the Directive will take place in 2007 in the framework of the broader review of legislation on industrial pollution prevention and control[65]. In this context the Commission will assess the implementation and possible development of the Directive in general, and more specifically the availability of measurement techniques for continuous monitoring of dioxins and furans and the impacts of implementing such techniques. Such monitoring would give a better picture of actual emissions. In addition, the Commission will assess the feasibility of monitoring of dioxin-like PCBs against the background of the ongoing work on extending the European Standard EN 1948 for measuring PCDD/F to also include dioxin-like PCBs (see action 17).

Action 13: *Commission to assess the feasibility of applying continuous measurements of PCDD/F, and of adding the monitoring of dioxin-like PCBs, in the context of the review of the Directive 2000/76/EC.*

[63] http://europa.eu.int/comm/environment/ippc/pdf/dioxins_final_rep.pdf

[64] COM (2005) 446

[65] According to the Directive, a report on the application of the Directive including proposals for revision as appropriate shall be submitted before 31 December 2008. The review process has already started in order to be coordinated with the IPPC review process during 2007.

Timeline: 2007

Addressing domestic sources

The contribution of domestic sources to certain POP emissions is becoming increasingly important in relative terms. It was estimated that these sources may contribute with as much as 45 % of total emissions of PCDD/F to air in the EU (BiPRO, 2006). Domestic sources include residential heating with wood and coal; open burning of waste and co-combustion of waste for heating purposes.

As regards residential heating with wood and coal, work has been launched by the Commission to implement the Directive 2005/32/EC[66] establishing a framework for the setting of eco-design requirements for energy-using products In this context, small combustion installations have been identified as a priority for future development of product labels and standards. Preparatory studies have started for oil, gas and electricity appliances and should start for wood and coal in 2006. The objective is to improve environmental performances as a whole, including emission of air pollutants. The work is for the time being focusing on "classical" pollutants (including particulate matter - PM) but synergies that may impact positively on unintentionally released POPs will be explored.

Action 14: *Commission to assess the scope for developing labels and/or product standards for small combustion appliances*

Timeline: 2007-2009

Control measures are not likely to be the most efficient way to address residential sources since the problem is linked to lacking awareness. However, these sources can be addressed, as is the case already in some Member States, through public awareness raising campaigns to influence household practices. The need for educating the public on the risks of domestic burning has been highlighted by many stakeholders and is also stated in the EU Dioxin Strategy. Awareness raising campaigns are most efficiently carried out at Member State level, and the Commission can promote the sharing of information and experiences in the area. The Commission will therefore compile information on emissions from residential combustion sources and experiences with initiatives for public education and their efficiency, and identify successful examples. A workshop will be organised to present and discuss the findings.

Action 15: *Commission to promote an exchange of information and good practices as regards releases from residential sources and awareness raising initiatives*[67].

Timeline: 2007-2008

Addressing emission monitoring and data gaps

Emission factors are a basic tool for setting up release inventories. As the quality of emission data is a cause for concern, a Standardized Toolkit for Identification and Quantification of

[66] OJ L 191, 22.7.2005, p. 29.

[67] To be financed within the framework of the LIFE+ programme.

Dioxin and Furan Releases has been developed by UNEP. The toolkit is in the process of being reviewed and developed further with a view to verify emission factors and address data gaps.

Action 16: *Commission to contribute to UNEP work on emission factors within available resources.*

Timeline: 2007

Also in the context of emissions monitoring, the Commission has mandated the work of CEN (European Committee for Standardization) to finalise a standard on measurement of air emissions of dioxin-like PCBs. This includes mainly the validation (e.g. definition of accuracy and standard deviation) of the measurement method. A grant is intended to be given to CEN during 2007 to enable validation at European scale. This action would then result in a harmonisation of measurements and will make measured dioxin-like PCB data better comparable.

Action 17 *Commission to support the validation of a CEN standard on measurement of air emissions of dioxin-like PCBs*[68]

Timeline: 2007

In the framework of the IPPC Directive industrial emissions have to be reported to the European Pollutant Emission Register (EPER) and are then made publicly available at a website[69]. The register will be replaced in 2007 by the more ambitious European Pollutant Release and Transfer Register (E-PRTR) The emission threshold for reporting on PCDD/F has been reduced compared to EPER by the factor of 10 to 0.1 g I-TEQ per year. This will ensure that more data on emissions of PCDD/F, especially in the metal industry sector, will be available from the year 2009 (publication of 2007 data) onwards. In addition to PCDD/F, reporting is also required for PCB, HCB and PAH.

The new register will also cover releases to land and off-site transfers of waste. In the medium to long term it is planned to also include the releases of POPs and other pollutants from diffuse sources, e.g. road traffic, agriculture, domestic heating, shipping and aviation.

Action 18: *Member States to report and Commission to publish extended POP emission data in the framework of E-PRTR*

Timeline: 2009

5.8 Identification and environmentally sound management of stockpiles and wastes

5.8.1 Existing requirements under the Stockholm Convention

Obligations: To develop appropriate strategies for identifying stockpiles, products and articles containing, consisting of or contaminated with chemicals listed in Annexes A, B or C; manage

[68] To be financed within the framework of the LIFE+ programme.

[69] www.eper.ec.europa.eu

stockpiles in a safe, efficient and environmentally sound manner; implement measures to reduce or eliminate releases from stockpiles and wastes containing chemicals listed in Annexes A, B or C in a manner that protects human health and the environment; take appropriate measures to ensure that waste products and Articles containing chemicals listed in Annexes A, B or C are handled in an environmentally friendly manner; dispose waste products and articles containing chemicals listed in Annexes A, B or C in a way that destroys the POPs content, taking into consideration the Technical guidelines for the environmentally sound management of persistent organic pollutant wastes developed under the Basel Convention; and endeavour to develop strategies for identifying sites contaminated with chemicals listed on Annexes A, B or C; if remediation is required then it must be done in an environmentally sound manner.

Implementation so far: The Waste Framework Directive 2006/12/EC and the Hazardous Waste Directive 91/689/EEC, set a number of provisions that ensure wastes including stockpiles being handled in an environmentally sound manner (see Annex I). Amongst others, this includes waste prevention promotion, classification rules for hazardous waste, the obligation to collect waste and to package and label it appropriately, to elaborate waste management plans, to permit waste disposal and recovery installations and the prohibition to dispose of waste in an uncontrolled manner.

Article 5 of the Regulation (EC) No 850/2004 requires stockpiles to be managed as waste. The holder of stockpiles greater than 50 kg, consisting of or containing any POP and the use of which is permitted shall provide the competent authority with information concerning the nature and size thereof. The stockpile shall be managed in a safe, efficient and environmentally sound manner. Member States must monitor the use and management of notified stockpiles.

Analysis and further actions:

The existing legal framework basically ensures the environmentally sound management of stockpiles and waste consisting of contaminated or containing POPs. Some actions should be envisaged as follow-up or complementation of the tasks to be addressed by the Basel Convention (see following subchapter).

With regard to obsolete pesticides the Commission Study (BiPRO 2005) estimated that there are stocks containing 5370 tonnes in the Member States, mainly in the new Member States. The amount of 5, 370 t of POP pesticides stockpile probably does not reflect the real situation and is probably largely underestimated.

Further locations and quantities may be still found in the course of the elaboration of the National Implementation Plans and hazardous waste management plans.

The Commission is of the opinion that the issue should be primarily dealt with on a Member State level. The costs should be borne by the "polluter-pays" principles as laid down in the Waste Framework Directive.

Beyond that Community funds are eligible for the disposal of the stockpiled obsolete pesticides.

Action 19*: Commission to review the NIPs and the hazardous waste management plans in view of their appropriateness to eliminate the stockpiles of POPs containing pesticides wastes.*
Timeline: NIPs: Review by end of 2007; Hazardous Waste Management Plans: Review by End of 2009

As regards the identification and remediation of sites contaminated by chemical in Annexes A, B or C, the Commission has adopted in September 2006 a proposal for a Thematic Strategy on soil protection[70]. Such Strategy contains a proposal for a framework Directive on the protection on soil. This proposal requires Member States to prevent soil contamination, to make an inventory of contaminated sites (including sites contaminated by substances in Annexes A, B and C) and to remediate the sites identified. Member States are also required to take measures to raise awareness and promote the transfer of knowledge and experience for a sustainable use of soil. This can include and exchange of information on the best available technologies for the remediation of POP-containing sites. Once the Thematic Strategy on soil is adopted by the Community, the provisions of Article 6 of the Stockholm Convention as regards soil contamination will be fulfilled.

For the EU, the historical contamination of soil with HCH is probably one of the main problems linked to POP compounds. Identification and quantification of the extent of this problem to develop appropriate risk management should be regarded as a priority action.

5.8.2 Further measures to be developed in cooperation with the Basel Convention

Obligation Close cooperation with the Basel Convention to establish low concentration limits for POPs in waste, levels of destruction and irreversible transformation and to determine methods that constitute environmental sound disposal.

Implementation so far : The Basel Convention has provisionally adopted in October 2004[71] :

- general technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with POPs and
- technical guidelines for the environmentally sound management of wastes consisting of, containing or contaminated with PCBs, PCTs or polybrominated biphenyls (PBB).

In addition, in April 2006 the Open-ended Working Group (OEWG) of the Basel Convention has completed guidelines for

- wastes consisting of, containing or contaminated with pesticides aldrin, chlordane, dieldrin, endrin, heptachlor, HCB, mirex or toxaphene or with HCB as an industrial chemical;
- Wastes consisting of containing or contaminated with DDT and
- Wastes conaining or contaminated with unintentionally produced PCDDs, PCDFsHCB or PCBs.

The work of the Basel Convention is reflected by the implementation measures on the EU level as follows.

[70] COM(2006)231 and COM(2006)232. http://ec.europa.eu/environment/soil/index.htm
[71] Decision VII/13 of the 7th Conference of the Parties of the Basel Convention (http://www.basel.int/meetings/cop/cop7/docs/33eRep.pdf)

Concentration limits according to Article 6(2)(c) of the Stockholm Convention.

In 2005 the European Commission conducted a study which elaborated a methodology to define concentration limits and presented concrete proposals for thresholds and other measures in the EU. Based on these results the Commission has proposed concentration limits which are very similar[72] with those adopted by the Basel Convention (see Table 3). On 18 July 2006, the Council adopted these concentration limits for POPs in waste (Regulation (EC) No 1195/2006).

Table 3: Concentration limits for POPs in waste refereed to in Article 7(4)(a).

SUBSTANCE	CAS No	EC No	CONCENTRATION LIMIT REFERRED TO IN ARTICLE 7(4)(a)
Aldrin	309-00-2	206-215-8	50 mg/kg
Chlordane	57-74-9	200-349-0	50 mg/kg
Dieldrin	60-57-1	200-484-5	50 mg/kg
Endrin	72-20-8	200-775-7	50 mg/kg
Heptachlor	76-44-8	200-962-3	50 mg/kg
Hexachlorobenzene	118-74-1	204-273-9	50 mg/kg
Mirex	2385-85-5	219-196-6	50 mg/kg
Toxaphene	8001-35-2	232-283-3	50 mg/kg
PCB	1336-36-3 and others	215-648-1 and others	50 mg/kg*
DDT	50-29-3	200-024-3	50 mg/kg
Chlordecone	143-50-0	205-601-3	50 mg/kg
PCDD/PCDF	1746-01-6 and others	217-122-7 and others	15 μg/kg**
The sum of α, β- and γ- HCH	58-89-9, 319-84-6, 319-85-7	206-270-8, 206-271-3 and 200-401-2	50 mg/kg
Hexabromobiphenyl	36355-01-8	252-994-2	50 mg/kg

* Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied** The limit is calculated as PCDD and PCDF according to the following toxic equivalency factors (TEFs):

[72] Only alpha-, beta- and gamma-HCH is of toxicological relevance. Therefore the concentration limit exclusively refers to them..

PCDD	TEF
2,3,7,8-TeCDD	1
1,2,3,7,8-PeCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.0001
PCDF	
2,3,7,8-TeCDF	0.1
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.0001

Methods for the environmental sound management of POPs according to Article 6(2)(b) of the Stockholm Convention

The Basel guidelines also contain information on such methods. Those are already laid down and in Community legislation (see chapter 5) and implemented in the Member States.

In addition, according to Annex V to Regulation (EC) No 850/2004 the following disposal and recovery operations, as provided for in Annex IIA and IIB of Directive 2006/12/EC, are permitted for the purposes of Article 7(2) when applied in such a way as to ensure that the persistent organic pollutant content is destroyed or irreversibly transformed:

D9 Physico-chemical treatment;
D10 Incineration on land, and
R1 Use principally as a fuel or other means to generate energy, excluding waste containing PCBs.

Regulation (EC) No 850/2004 includes the option to deal with waste in exceptional circumstances otherwise than to destroy or irreversible transform the POPs content in the waste. This derogation may only be applied if several conditions are complied with:

- the holder of the waste has demonstrated to the competent authority that the operation is environmentally preferable to the destruction or irreversible transformation of the waste content;
- the operation is in accordance with relevant Community legislation;
- the Member State concerned has informed the other Member States and the Commission of its authorisation and the justification for it.

The Regulation only allows the permanent storage in safe, deep, underground, hard rock formations and salt mines or a landfill site for hazardous waste (provided that the waste is solidified or partly stabilised where technically feasible) under this derogation.

In addition, maximum concentrations limiting the usage of this derogation were proposed by the Commission (see table below). Waste exceeding these ceilings shall not be managed in another environmentally preferable way than the destruction or irreversible transformation of the POPs content in the waste.

Substance	**Maximum concentration limit**
Aldrin	5000 mg/kg
Chlordane	5000 mg/kg
Dieldrin	5000 mg/kg
Endrin	5000 mg/kg
Heptachlor	5000 mg/kg
Hexachlorobenzene	5000 mg/kg
Mirex	5000 mg/kg
Toxaphene	5000 mg/kg
PCBs	50 mg/kg
DDT	5000 mg/kg
Chlordecone	5000 mg/kg
PCDD/PCDF	5 mg/kg
The sum of α-, β- and γ- HCH	5000 mg/kg
Hexabromobiphenyl	5000 mg/kg

The proposal on the maximum concentration limits should be adopted in 2007.

Methods to destroy or irreversibly transform the POPs content in waste according to Article 6(2)(a) of the Stockholm Convention

The above mentioned General Guidelines adopted by the Basel Convention specify conditions on atmospheric emissions, aqueous releases and solid residues as well as on the conformity with BAT and BEP to be met. On the EU level, the Directive 2000/76/EC ensures in particular the compliance with the dioxin and furan emission concentration limit. Also BAT for the operation of waste incinerators and for waste treatment has been adopted[73].

Analysis and further actions:

Low concentration limits have been adopted and maximum concentration limits are expected to be adopted in the near future. Hereby a corner stone of the waste related provisions of the Stockholm Convention will become implemented. This will bring further implementation experiences. For instance concrete information will have to be forwarded to the Commission and other Member States on the application of the exemption for other environmentally preferable waste management options. This review is legally obligatory (see article 7(7) of the Regulation (EC) No 850/2004).

[73] See http://eippcb.jrc.es/pages/FActivities.htm

Action 20*: Commission to review the derogations for low POPs concentrations in waste and for other environmentally preferable options than destruction.*
Timeline: *Review by end of 2009 in accordance with article 7(7) of the* Regulation (EC) No 850/2004

The adoption of the low concentration limits laid down in Annex IV will entail the application of the derogation relating to POPs waste with higher concentrations. Those wastes may be dealt with by other environmentally preferable options than destruction of the POPs content. The operation requires the notification and the justification for it to the Commission and other Member States. Pursuant to Article 7(6) the Commission shall define a format for the submission. It will also help to carry out the review laid down in Article 7(7) (see previous action).

Action 21*: Commission to define a format for the submission of the notifications and their justification concerning the use of other environmentally preferable options than destruction.*
Timeline: *Commission proposal in 2007*

The definition of a low concentration of POPs in waste has been made in view of the availability of knowledge, of analytical methods, of treatment capacity and the priority that should be given to the disposal of wastes with a high POPs content. It should be considered whether further measures are appropriate for wastes with a low POPs content to ensure that the waste is recovered and disposed of without risks for the human health and the environment. One possible measure could be that waste containing more than 1 µg TEQ PCDD/PCDF/kg may only be recovered, if they are sufficiently solidified, or that such wastes are classified as hazardous.
Also the OEWG proposed to the next Conference of the Parties of the Basel Convention to include in the work programme for the OEWG for 2007-2008 to consider further guidance on other disposal methods when the POPs content is low and to establish a concentration limit for the classification of POPs waste as hazardous.

Action 22*: Commission to review further measures on waste with a low POPs content and to propose concentration limits for the classification of waste contaminated with POPs as hazardous.*
Timeline: *End of 2008*

The participation in the work of the Basel Convention has closely linked the elaboration and completion of the Technical Guidelines with the completion of the Regulation (EC) No 850/2004. The further participation will mutually stimulate progress for the environmentally sound management of POPs waste.

Action 23*: Commission to actively contribute to the Basel Convention activities on POPs waste*
Timeline: *Continuous*

The above mentioned study on the implementation of the POPs Regulation and other stakeholders proposed additional operation methods, which also lead to the destruction and irreversible transformation of the POPs content in the waste. The Basel Convention has taken up these proposals during COP 8 by updating the General Technical Guidelines on the Environmentally Sound Management of waste consisting of, containing or contaminated with

POPs. Two new methods were proposed, "R3 Recycling/Reclamation of organic substances, which are not used as solvents, but restricted to waste-to-gas conversion" and "R4 Recycling/reclamation of metals and metal compounds, but restricted to activities of primary and secondary metallurgy"). These methods should be assessed and, if appropriate, added to Annex V part I of the POPs Regulation.

Action 24*: Commission to assess proposals for other operations for the destruction or irreversible transformation of POPs in waste, in particularly those adopted under the Basel Convention, and, if appropriate, to amend Annex V part 1 of the POPs Regulation*
Timeline: *2007 (and later on if other new proposals emerge)*

6 Implementation of the obligations on supporting activities

6.1 Information Exchange

Obligation: Article 9: To facilitate or undertake information exchange relevant to the reduction or elimination of the production, use and release of POPs and alternatives to POPs including information relating to their risks as well as their economic and social costs. This information exchange, either directly or through the Secretariat, can also be used to develop alternatives to POPs. Where Parties exchange information on health and safety of humans and the environment it must not be treated as confidential. Parties that exchange other information must protect any confidential information as mutually agreed.

Implementation so far: As described above, the Community has taken several actions to eliminate or reduce releases of POPs to the environment. Especially important is the work done on the development of the BAT-guidance documents under the IPPC Directive (so called BREF documents). The Commission is disseminating widely (mainly through Europa-website) information on these activities. In addition, risk assessment reports are made publicly available on internet (e.g., DG ENV website for biocides, EFSA (European Food Safety Authority) website for plant protection products and ECB (European Chemicals Bureau) website for industrial chemicals). Under REACH, much of the key safety information will be available free of charge on the website of the European Chemicals Agency and more will be available on request.

Analysis: The Community is disseminating information efficiently via Internet. The area where information exchange could be improved is to facilitate the identification of substances that can be used as alternatives to POP and to disseminate their risk assessment reports more widely. Arrangements have been made within the OECD to exchange information on risk assessment reports and these arrangements could be broadened to Stockholm Convention Parties.

Action 25: *Commission to facilitate the identification of substances that can be used as alternatives to POP and to disseminate their risk assessment reports more widely.*
Timeline: Continuous

6.2 Public information, awareness and education

Obligations: Article 10: Promote and facilitate awareness of POPs, among policy and decision makers, and, along with industry and professional users, provide and facilitate up-to-date information to the public as well as develop education and training programmes. To give consideration to the development of mechanisms, including pollutant release and transfer registers, for the collection and dissemination of information on the release and disposal of chemicals listed in Annexes A, B and C. To consult with national stakeholders when developing and implementing the national implementation plan.

Implementation so far: Access to environmental information and consultation with stakeholders are an integral part of the Community environment policy. Accordingly, also the draft Community Implementation Plan has been made available for comments by authorities and stakeholders.

In general, a lot of emphasis is put on dissemination of information to citizens, industry and other interested parties on Community's environment policy and activities. The main tool for public information is the Europa-website and a specific web-site dedicated to POPs and the Dioxins Strategy has been established. Moreover, the European Environment Agency publishes a substantial amount of information relevant to POPs, which is available through its website. This includes EPER, the EU inventory of emissions to air reported under CLRTAP and the EU Water Information System for Europe (WISE). The Community also provides financial assistance for NGOs for information campaigns.

Public participation is also a key element to the implementation of the Water Framework Directive. Its Article 14 specifies that Member States shall encourage the active involvement of all interested parties in the implementation of the Directive and development of river basin management plans. These plans may include information on the level of POPs in the aquatic environment and measures to reduce pollution from these substances, where relevant (Article 13 and Annex VII).

The results of POP-related research projects have been disseminated through various sources, including the website, catalogues and project brochures.

Analysis: According to the principle of subsidiarity, public information, awareness raising and education on POPs remain at the domain of the EU Member States. The Commission has concentrated on information on Community legislation and other activities. An additional problem is the language: the EU has more than 20 official languages. The Commission has limited possibilities to put in place large information campaigns on POPs in all languages. However, coordinated information campaigns at Community level are not excluded if they are deemed appropriate. After most Member States have developed their NIPs, it will be possible to evaluate the need for and the added value of such concerted action in the field of POPs.

6.3 Research, development and monitoring

Obligations: Article 11: To encourage research, development and monitoring of POPs on their sources, releases and transport to the environment, presence, levels, trends and effects in humans and the environment, socio-economic and cultural impacts, release reduction and/or elimination and harmonised methodologies for making inventories and analytical techniques

for measuring releases. In taking this action, Parties should also support and further develop international programmes aimed at research, data collection and monitoring, support efforts to strengthen national scientific and technical research capabilities, take into account the concerns and needs of developing countries to improve their capability to participate, undertake research towards alleviating the effects of POPs and make the results of this available to the public and encourage and/or undertake cooperation with regard to storage and maintenance of this generated information.

Implementation so far: Community research activities on health impacts of POP's intensified under the 5th Research Framework Programme 'FP5' (1998-2002). The funded projects have recently ended or will end in 2007. The Quality of life and management of living resources and the Environment and Sustainable Development thematic programmes of FP5 have spent around €60 million that addressed the human health and wildlife effects of chemicals and POPs in particular, sponsoring 18 multi-centre, international projects. The results of a wide variety of projects on endocrine disrupters, covering topics on risk assessment, human health and environmental effects as well as technology development, are already available[74]. Project-related data has also been published in a booklet called 'Commission research in action: Tackling the hormone disrupting chemicals issue' (http://ec.europa.eu/research/environment/pdf/hormone_disrupting_chemicals_issue.pdf). In addition, a project under the international cooperation (INCO) programme of FP5 (MALVECASIA project, ec.europa.eu/research/health/poverty-diseases/projects/27_en.htm) looked into monitoring of insecticide resistance and mapping of malaria vectors in South East Asia

One of the main drivers for Research in Environment and Health in the 6th Framework Programme of Research ('FP6' - 2002-2006 - http://cordis.europa.eu/fp6/) has been the European Commission's Environment and Health Action Plan, adopted in 2004, which has as its main aim to improve the understanding of the link between environmental factors and health. The implementation of the goals of this action plan through research has started in FP6 and will continue in the Seventh Framework Programme of Research ("FP7" – 2006-2013 - http://cordis.europa.eu/fp7/home_en.html) via funding of several large- and small-scale research projects on topics identified as priorities in the Action Plan. One priority is the health impact of endocrine-disrupting chemicals.

Under the FP6, POP-related projects have been funded by Priority 'Food Quality and Safety', 'Environmental Health Risks' sub-area (www.cordis.lu/food), and to a lesser extent, by Priority 'Global Change and Ecosystems' (www.cordis.lu/fp6/sustdev.htm), sponsoring Integrated Projects such as INTARESE (http://intarese.imperial-consultants.co.uk) and NOMIRACLE (http://nomiracle.jrc.it/default.aspx) on integrated risk assessments including chemicals. Priority 'Life Sciences, Genomics, and Biotechnology for Health' (www.cordis.lu/lifescihealth/home.html) has sponsored some toxicology-related projects and projects focused on in vitro replacement of animal testing. A full list of these projects will be available in 2006 at http://ec.europa.eu/research/environment/index_en.htm. The project DROPS funded under the Scientific Support to Policy Priority (http://ec.europa.eu/research/fp6/ssp/index_en.htm) is aimed at the assessment of health impact also in monetary terms of a wide range of priority pollutants, including POPs, according to the Environment and Health Strategy and Action Plan. The NORMAN (Network of reference laboratories and related organisations for monitoring and bio-monitoring of emerging

[74] Results in the in the form of summaries are available at: *http://ec.europa.eu/research/quality-of-life/ka4/index_en.html and http://ec.europa.eu/research/endocrine/index_en.html.*

environmental pollutants) is a coordination action that tries to improve EU capabilities for monitoring emerging pollutants. Finally, the IP Project Thresholds (http://www.thresholds-eu.org) aims at closing the gap between Science and Sustainability Policies, and at supporting Sustainable Development, through the establishment and testing of innovative policies formulation mechanisms based on the identification of thresholds and Points of No-return , i.e. pressures that can be imposed on a given resource while maintaining acceptable levels of environmental quality concerning nutrients and POPs.

Details on projects funded under FP5 and FP6 are given in Annex III.

In the 7th Research Framework Programme 'FP7' (2007-2013), major funding for POPs-related research is likely to come from the 'Environment' theme of the Cooperation_Programme (http://ec.europa.eu/research/future/pdf/com2006_364_final_en.pdf), which will have a specific Environment and Health activity. However, collaborative projects may also be funded from the themes 'Health' as well as 'Food, Agriculture and Fisheries, and Biotechnology'. The first call of this 'Food, Agriculture and Fisheries, and Biotechnology' theme in the area "Food quality and Safety" containing the topic "Detecting contaminants in the food and feed chain" specifically mentions POPs. The expected impact of this topic is improved toxicological exposure assessments for key potential hazards, new approaches to assessing the hazard posed by chemical risks, contribution to the development of validated predictive models for behaviour of relevant hazards in food and feed. The current planning of the second call tentatively includes the topic "Food sampling strategies for risk analysis" and aims at improved and harmonised sampling techniques along the food chain for supporting and advancing food safety risk assessment and provides information and support for food safety policies in the areas of contaminants, chemical and microbiological safety. Present planning for the 'Health' theme foresees support for research targeting the mosquito vector to block disease transmission. Since in Developing Countries efficient control of insect-borne diseases such as malaria, which is transmitted by mosquito vectors, still implies the use of DDT, which is not only environmentally noxious, but also increasingly ineffective due to resistance development, there is a clear need for research to find sustainable and affordable alternatives for DDT.

Research or development projects are also frequently funded from other than research budget lines, as examples are the study on dioxin contamination and exposure launched to support the Environment and Health Strategy (SCALE).

As part of their institutional activities the JRC-IES (ATEAM Action) has started a monitoring programme concerning the maintenance and operation of an EMEP station at Ispra (Italy) where POPs are analysed. In addition, two Mediterranean cruises measuring concentrations of PCBs, PAHs, PBDEs and PCDD/Fs in air, water and biota are being carried out (2006, 2007). This will allow an assessment of the atmospheric inputs in the Mediterranean Sea as well as the role of the biological pump in the cycling of POPs. These monitoring activities are accompanied by several modelling developments at different scales concerning the fate and effects of POPs in aquatic ecosystems.

The ENSURE Action foresees complimentary modelling and monitoring activities related to POPs , at a pan-EU scale and adopting environmental multimedia approaches for the fate of chemical contaminants. Ongoing activities include the modelling of chemical fate using an advanced 3D assessment model developed with detailed data available in the JRC, comparison with monitoring data using in-house laboratories with state-of-the-art equipment including for dairy samples to facilitate comprehensive sampling across the EU, and collaborations with e.g.

the European Environment Agency in relation to risk mapping using the European emissions database (EPER).

The European Environment Agency collects, prepares and disseminates timely, targeted, relevant and reliable information on the state, trends and outlooks of the environment at European level. The Agency is also responsible for developing and coordinating Eionet (the European environment information and observation network) and also co-operates actively with other relevant bodies and international organisations. It collaborates with Eionet and the Commission (DGs Environment, Eurostat and the Joint Research Centre) in the establishment of the shared European environment information system.

Under the Water Framework Directive (Directive 2000/60/EC), the substances on the priority list (many of which have POP characteristics), must be monitored if discharged into the river basin or sub-basin. In addition, other pollutants also need to be monitored if they are discharged in significant quantities in the river basin or sub-basin. The monitoring networks must be operational by 2006. Member States should report to the Commission a summary of their networks by March 2007. The Commission will seek to enhance information on priority substances, in particular on environmental quality, trends, and releases and pathways in the aquatic environment. To this end, the European Commission and the European Environment Agency are already developing a shared "Water Information System for Europe" (WISE). WISE aims to modernise the collection and dissemination of information on water across Europe thus streamlining the reporting process, gathering more useful and relevant information and making the information exchange process as efficient as possible.

The JRC-IES leads the Chemical Monitoring Activities where intercalibration exercises are being conducted to harmonise the monitoring of POPs in water in EU. In addition EU-wide monitoring campaigns concerning key pollutants (PBDEs and PFOs) are starting.

Many EU Member States also have coordinated marine monitoring of POPs under regional seas conventions such as OSPAR (North-East Atlantic Ocean) and HELCOM (Baltic Sea) in the context of their strategies to deal with pollution by hazardous substances.

The EU adheres and complies with Stockholm Convention provisions that recognise DDT as a potentially toxic substance to humans and the environment substance and whose production and use in agriculture should be gradually phased out. The EC provides significant support to confront malaria. EC support takes various forms including budget support and sector strategies and is complemented by participation in multilateral and global initiatives. A large proportion of this aid is directed at developing safer prevention tools and rolling out new strategies such as the coverage of Long Lasting Insecticide Treated Nets. We support many countries in their fight against malaria but above all the EC supports these country-owned poverty reduction and health strategies, focussing on the access to basic prevention and treatment services.

Analysis: Research, development and monitoring on POPs has not been concerted under particular programmes but is scattered under various budget lines, themes and programmes. Therefore it is difficult to assess the effectiveness of the Community measures in this field.

As malaria and the need for DDT in disease vector control remain as major challenges globally, the Community should study the possibilities to step up efforts in finding sustainable and affordable alternatives for DDT.

To enable effective actions to be taken to protect human health and the environment, better data and knowledge concerning formation, release, dispersion, cycling, exposure pathways and hazardousness are necessary. Such data would also help to set clear priorities among measures.

Reducing costs of analyses and improving methods for on-line measurements are key concerns when it comes to increasing knowledge about unintentionally formed POPs. The development of cheaper analyses with a view to attaining more and better measurement data is crucial as a basis for identifying sources and keeping track of releases from primary, secondary and diffuse sources.

In order to be able to assess emissions from primary sources, more use needs to be made of continuous sampling methods. This kind of sampling also needs to be further developed. With continuous sampling it is possible, in addition, to monitor how and to what extent process variations affect the formation of POPs. This information will allow us to take preventive measures to decrease the formation.

Other areas of interest are research on the formation of unintentionally formed POPs in all thermal processes, including small scale combustion; the development of tools to predict environmental hazards; and the development of methods of analysing new and existing POPs.
It is also important to develop a better understanding of mechanisms for bioaccumulation for non-lipophilic substances e.g. perfluorinated substances and of the effects of potential POPs candidates with insufficient data.

Action 26: *Commission to promote that the 7th Research Framework Programme covers POP-related topics, thus allowing for support to projects examining inter* alia *long-term health impacts of exposure to POPs at environmentally relevant concentrations or development of affordable alternatives for DDT to control malaria, e.g. by exploiting available biological knowledge on the mosquito vector.*

Timeline: continuous

Action 27: *Exchange of information and/or coordination of research, both on community and international, level would be beneficial in minimising duplication of effort.*

Timeline: Continuous

7 Implementation of the other commitments

7.1 Technical Assistance

Obligations: Article 12: To cooperate, in response to requests to provide timely and appropriate technical assistance to developing Parties and Parties with economies in transition, especially least developed countries and small island developing states, to assist them, to develop and strengthen their capacity to implement their obligations under the Stockholm Convention. Article 12.3 places an obligation on developed country Parties to provide such assistance and also mandates the establishment of regional and sub-regional centres for capacity-building and transfer of technology.

Implementation so far: Community technical assistance responds to requests and is financed through its aid programmes which are described in section 7.1. The Commission has worked with the Member States in the COPs to examine the scope for synergies with the Basel Convention Regional Centres and the possibilities that they could fulfil the functions of the centres to be established under the Stockholm Convention.

Analysis: COP 2 agreed on most aspects of the terms of reference for regional centres although it will need to return to the question of providing running costs for them at COP 3 when it will also need to consider selection criteria. The Commission will continue to participate in both the synergies debate and the work under the Stockholm Convention on establishing centres. A cost effective solution will be required that provides accessible technical support for governments and other stakeholders.

There is a need for a better coordination between the bilateral programmes of the Commission and those of the Member States in the POPs area.

Action 28: *To prepare a proposed EU position on financing for the running costs of regional centres, on selection criteria and on links to the Basel Centres and thereafter to consider how Community technical expertise on POPs can be made available to developing countries and to consider possible support for selected Stockholm Centres.*

Timeline: The proposed position is required by 2007, options for using expertise should be available by 2008 and any support for Centres should be identified before COP 4 in 2009.

Action 29: *The Community should develop mechanisms for better coordination between the bilateral aid programmes of the Commission and those of the Member States with regards to POPs.*

Timeline: Continuous.

7.2 Financial Assistance

Obligations: Article 13: All parties undertake to provide financial support and incentives in respect of those national activities that are intended to achieve the objective of the Stockholm Convention in accordance with their national plans, priorities and programmes.

Developed country Parties are required to provide new and additional financial resources through the financial mechanism to enable developing country Parties and Parties with economies in transition to meet the agreed full incremental costs of implementing measures which fulfil their obligations under the Stockholm Convention.

Implementation so far: It is for the Member States rather than the Community to fund domestic implementation in accordance with Article 13.1, although if eligible States wanted to use Structural Funds to help finance POPs related investments there could be scope for doing so, providing that this was agreed in the Country Support Framework. LIFE+ funds could also be used to support certain activities, provided that the countries are eligible. The Community is not a country Party and is thus not directly obliged by Article 13.2 to provide financial resources for incremental costs to developing countries and countries with economies in transition. In any case, since the GEF (Global Environment Facility) can only receive

contributions from States, the Community is unable to contribute to the financial mechanism of the Stockholm Convention.

Analysis: While Article 13 imposes no binding obligations on the Community, the exhortation to provide financial resources through its bilateral assistance programmes is relevant. The Community does not have separate financial and technical assistance programmes for developing countries and countries with economies in transition; rather money is provided largely through geographically based aid programmes and can be used either for the provision of goods and capital projects or for capacity-building. Particular attention is paid to the large number of least developed countries in Africa and to Caribbean and Pacific states through the Cotonou Convention that links these regions to the Community. In accordance with the 2005 Paris Declaration on Aid Effectiveness, Community geographic aid responds to requests from countries, which helps to ensure that programmes are country owned and led. So far, development partners have not requested funding for POPs relevant investments or technical assistance at the country level and this is unlikely to change in the near future since few developing country governments see a strong link between the Stockholm Convention and meeting the Millennium Development Goals that are the major determinant of aid priorities.

However, POPs related projects requested by international organisations such as UNITAR (United Nations Institute for Training and Research) and the Africa Stockpiles Programme, led by the World Bank, have received Community support through a budget specifically reserved for environmental projects. Starting in 2007 the Community's external aid instruments are being considerably simplified. Six main instruments will regulate almost all Community support. An enhanced thematic programme on Environment and the Sustainable Management of Natural Resources, including Energy (ENRTP) will include dedicated resources for chemicals and wastes management.

Action 30: *To consider the scope for funding POPs related assistance when preparing and approving the Thematic Strategy Paper (TSP) governing the use of the ENRTP for the period 2007 -2010 and thereafter when drawing up the Annual Work Programme (AWP).*

Timeline: Annually.

7.3 Reporting

Obligations: Article 15: To report to the Conference of the Parties on the measures the Party has taken to implement the provisions of the Stockholm Convention and on the effectiveness of such measures in meeting the objectives of the Stockholm Convention. Reporting shall include data on the total quantity of production, import and export of the chemicals listed in Annexes A and B and a list of countries from which it has imported and exported substances. The first report is to be submitted by 31 December 2006 for consideration by COP-3 in 2007. The subsequent reports will need to be submitted every four years thereafter for consideration of the COP at its meeting to be held the following year.

Implementation: In general, both the Community and the Member States will have to report to the COP according to the timetable laid down by the COP and in accordance with their respective competences. In addition, Member States are obliged by Article 12 of the Regulation (EC) No 850/2004 to report regularly on the implementation of the Regulation to

the Commission. On issues which belong to the Community competence, the Commission will be responsible for the joint reporting on behalf of the Community and the Member States.

Analysis: The Commission will coordinate the EU reporting on issues belonging to its competence. The first reporting to the COP will take place by the end of 2006. the Commission submitted the report on issues belonging to the Community competence on 22 December 2006.

Action 31: *Commission to submit the report on the implementation of the Stockholm Convention on issues belonging to the Community competence.* Timeline: Periodically.

7.4 Effectiveness Evaluation

Obligations: Article 16: Conference of the Parties to periodically evaluate the effectiveness of the Stockholm Convention, starting four years after entry into force. The evaluation will be conducted on the basis of available scientific, environmental, technical and economic information.

Implementation so far: Article 9 of Regulation (EC) No 850/2004 stipulates that the Commission and the Member States shall establish, in close cooperation, appropriate programmes and mechanisms, consistent with the state of the art, for the regular provision of comparable monitoring data on the presence of dioxins, furans and PCBs as identified in Annex III in the environment.

The outcome of the ongoing work of the Ad hoc Provisional Technical Working Group for the Global Monitoring Plan for POPs will probably be very useful to identified gaps within the existing EU monitoring programmes.

Presently, harmonised monitoring at EU-level exists for emissions of all by-product POPs through the release register EPER/E-PRTR which is described above (3.1 Legislative instruments). There is also harmonised monitoring in the area of feed and food where it is recommended that a number of defined food and feed samples are analysed yearly. Common methods for sampling and analysis ensure comparability of the results that will be compiled by the Commission in a database with the aim of having a clear picture of the time trends in background presence of these substances in feed and food.

The Commission is in the process of testing out the feasibility of an EU coordinated approach to Human Biomonitoring (HBM). HBM is an effective tool to evaluate the effectiveness of policies because it allows good assessment of temporal trends in total human exposure to environmental pollutants. The environmental pollutants to be biomonitored in the EU pilot project have not been decided yet, but might include some POPs.

Member States should be encouraged to actively participate to the WHO's programme on Biomonitoring of Human Milk for Persistent Organic Pollutants. Additional initiatives such as "The Environment Observation Conference" (www.environment-observation.org) could also be helpful.

Analysis: The Community and the Member States will continue to play an active role in the international work regarding the effectiveness evaluation but at the same time establishment of ambitious new monitoring programmes is not supported. In addition, before proposing any potential additional monitoring, identification of existing monitoring needs to take place, in order to avoid duplication and make best use of existing monitoring. However, in other regions, especially in Asia and Africa, new monitoring may be necessary.

7.5 Addition of Future Chemicals to the Stockholm Convention

Obligations: The Stockholm Convention does not lay down any particular obligation concerning addition of chemicals to it but allows any Party to propose amendment of the Stockholm Convention by listing of further substances in it.

Implementation so far: The Commission has initiated discussion on additional POP substances by proposing already in 2004 a Council Decision on further proposals (COM(2004 537 final). This initiative has so far leaded the Community and the Member States being Parties to the Stockholm Convention to propose listing of three additional substances (chlordecone, HBB and PFOS) to the Stockholm Convention. Moreover, the Community is fully supporting the proposals by Norway and Mexico. All these proposals have now passed the first and second phase performed by the POP Review Committee. They will pass to the risk management evaluation phase.

In June 2006, three new proposals (SCCPs, octaBDE pentachlorobenzene) have been sent by the EU to the secretariat of the Stockholm Convention. All these proposals have now passed the first screening phase performed by the POP Review Committee. They will pass to the risk profile phase

Analysis: The Community and the Member States have put throughout the negotiations on the Stockholm Convention a lot of emphasis on the widening of the initial list of 12 POP substances to additional POP substances warranting global action. The proper functioning of the POP Review Committee is of crucial importance in this regard. It is evident that the Commission and the Member States need to actively participate in and support the POP Review Committee in its work in order to ensure speedy evaluation of the submitted proposals.

Having ensured that POP criteria are fully taken into account in the risk assessment of chemicals and pesticides within the Community, identification of further potential POP candidates can become more systematic. In many cases, however, the data provided under the regulatory schemes is not sufficient for deeming whether international action is warranted but additional information especially from monitoring programmes is needed. The coverage of current monitoring programmes should be expanded to emerging POP substances. In addition, cooperation and information exchange systems between the EU and other Parties should be strengthened in this regard.

Action 32: *Commission and Member States to continue work on identification of potential POP substances warranting international action. Commission to initiate formal proposals by the Community, when appropriate. Commission and the Member States to increase and strengthen Community wide and international cooperation and information exchange concerning identification of potential POP substances and on concentrations of emerging POP substances especially in remote regions and on the extent of trans-boundary dispersion.*

Timeline: Continuous.

ANNEX I

Existing Community legislation on polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF) and polychlorinated biphenyls (PCB)

Waste incineration

– *Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste*
  - Limit value for air emissions: 0.1 ng I-TEQ/m3
  - Limit value for discharges of waste water from the cleaning of exhaust gases: 0.3 ng I-TEQ/l
  - Applies to incineration of almost all types of waste in incineration plants as well as co-incineration plants.

⊙ http://ec.europa.eu/environment/air/stationary.htm

Waste

– *Council Directive 2006/12/EC of 5 April 2006 on waste*
  - Prohibits the abandonment, dumping or uncontrolled disposal of waste;
  - Promotes waste prevention, recycling and processing for reuse;
  - Provides for cooperation between the Member States with a view to establishing an integrated and adequate network of disposal installations (taking account of the best available technologies) so as to enable the Community as a whole to become self-sufficient in waste disposal and to enable the Member States to move towards that aim individually. This network should enable waste to be disposed of in one of the nearest appropriate installations that guarantee a high level of environmental protection;
  - Any holder of waste has it handled by a private or public waste collector or a disposal undertaking, or disposes of the waste himself in compliance with these measures;
  - Permit obligation for undertakings or establishments treating, storing or tipping waste on behalf of third parties, relating, in particular, to the types and quantities of waste to be treated, the general technical requirements and the precautions to be taken; competent authorities may periodically check that the conditions of the permit are being complied with; they also monitor undertakings which transport, collect, store, tip or treat their own waste or third parties' waste;
  - "Polluter pays" principle: cost of disposing of waste must be borne by the holder who has waste handled by a waste collector or an undertaking and/or by previous holders or the producer of the product giving rise to the waste;
  - Competent authorities to draw up one or more waste management plans relating, in particular, to the types, quantities and origins of the wastes to be recovered or disposed of, the general technical requirements, any special arrangements for particular wastes, and suitable disposal sites and installations.

– *Council Directive 91/689/EEC of 12 December 1991 on hazardous waste*
  - PCDD/PCDF and PCBs are classified as hazardous waste. The Member States must ensure that sites where such waste is discharged are identified and recorded. They must also ensure that different categories of hazardous waste are not mixed and that hazardous waste is not mixed with non-hazardous waste. The competent authorities

must publish plans for the management of hazardous waste and these plans are being evaluated by the Commission.

⊙ http://ec.europa.eu/environment/waste/hazardous_index.htm

– *Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT)*
  - Member States shall take the necessary measures to ensure that used PCBs are disposed of and equipment containing PCBs are decontaminated or disposed of as soon as possible. Decontamination and/or disposal shall be effected at the latest by the end of 2010. Member States shall ensure that inventories are compiled of equipment with PCB volumes of more than 5 dm³, and shall send summaries of such inventories to the Commission.

⊙ http://ec.europa.eu/environment/waste/pcbs/index.htm

– *Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community*
  - The Regulation sets strict control procedures for the shipment of PCB-containing waste to avoid illegal dumping.
  - Applies to wastes that contain, consists of or are contaminated by PCDD/PCDF, and PCB at a concentration level of 50 mg/kg or more.

⊙ http://ec.europa.eu/environment/waste/shipments/index.htm

– *Council Directive 75/439/EEC of 16 June 1975 on the disposal of waste oils*
  - Maximum limit of 50 ppm PCB content of regenerated oil or oil used as fuel

⊙ http://ec.europa.eu/environment/waste/oil_index.htm

– *Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE)*
  - PCB containing capacitors in accordance with Council Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) have to be removed from any separately collected WEEE.

⊙ http://ec.europa.eu/environment/waste/weee_index.htm

Integrated Pollution Prevention and Control

– *Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control*
  - Installations covered by Annex I of the Directive are required to obtain a permit from the Member States' authorities. The permits must be based on the concept of best available techniques (BAT) and must include emission limit values for certain pollutants such as dioxins.

⊙ http://ec.europa.eu/environment/ippc/index.htm

– *Commission Decision 2000/479/EC of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC*
  - Data on the principal industrial emissions to the air are collected and published every three years. EPER will be replaced by E-PRTR.

⊙ http://europa.eu.int/eur-lex/pri/en/oj/dat/2000/l_192/l_19220000728en00360043.pdf

– *Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register*

- E-PRTR is intended to fully implement the obligations of the UN-ECE PRTR Protocol and extend beyond the scope of EPER mainly in terms of more facilities included, more substances to report, additional coverage of releases to land, off-site transfers of waste and releases from diffuse sources, public participation and annual instead of triennial reporting. The first reporting year under the E-PRTR will be the year 2007 and respective information will have to be reported by Member States in June 2009. The Commission will publish the data in autumn 2009.

⊙ http://ec.europa.eu/environment/ippc/eper/index.htm

Water

– *Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances*

– *Council Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community*
  - Establishes the framework for laying down emission limit values and environmental quality standards at EU level

⊙ http://ec.europa.eu/environment/water/water-dangersub/76_464.htm

– *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy*

⊙ http://ec.europa.eu/environment/water/water-framework/implementation.html

Major Accident Hazards

– *Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances*
  - The Directive aims firstly at the prevention of major-accident hazards involving dangerous substances and secondly, as accidents do continue to occur, at the limitation of the consequences of such accidents.

⊙ http://europa.eu.int/comm/environment/seveso/index.htm

Feed and food

– *Commission Regulation 1881/2006 of 19 December 2006 s setting maximum levels for certain contaminants in foodstuffs (OJ L 364, 20.12.2006, p.5)*
  - The Regulation establishes maximum levels for PCDD/PCDF and dioxin-like PCBs for meat and meat products, fish and fishery products, milk and milk products, hen eggs and egg products, and oils and fats.

⊙ http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_364/l_36420061220en00050024.pdf

– *Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 on undesirable substances in animal feed, feed (OJ L 140, 30.5.2002, p. 10) as last amended by Commission Directive 2006/77/EC (OJ L 271, 30.9.2006, p. 53).*

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  - The Directive establishes maximum levels and action levels for PCDD/PCDF and dioxin-like PCBs and other POPs in feed materials of plant origin, minerals, binders, animal fat, and other products of animal origin, fish oil, fish meal, and compound feedingstuffs, including fish feed.

- http://eur-lex.europa.eu/LexUriServ/site/en/consleg/2002/L/02002L0032-20060224-en.pdf

– *Commission Recommendation 2006/88/EC of 6 February 2006 on the reduction of the presence of dioxins, furans and PCBs in feedingstuffs and foodstuffs (OJ L 42, 14.20.2006, p. 26)*
  - The Recommendation establishes action levels for foodstuffs
  - Under the Recommendation, the Member States, in proportion to their production, use and consumption of feed materials, feedingstuffs and foodstuffs, are to carry out random monitoring of the presence of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in feed materials, feedingstuffs and foodstuffs, including fish and fishery products.
  - http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_042/l_04220060214en00260028.pdf

– *Commission Recommendation of 16 November 2006 on the monitoring of background levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in foodstuffs, OJ L 322, 22.11.2006, p. 24–31. (2006/794/EC)*
  - The Recommendations contain detailed guidelines on the number of defined food samples to be analysed yearly
  - http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_322/l_32220061122en00240031.pdf

– *Commission Recommendation of 11 October 2004 on the monitoring of background levels of dioxins and dioxin-like PCBs in feedingstuffs OJ L 321, 22.10.2004, p. 38–44. (2004/704/EC)*
  - The Recommendations contain detailed guidelines on the number of defined feed samples to be analysed yearly
  - http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l_321/l_32120041022en00380044.pdf

– *Commission Regulation (EC) No 1883/2006 of 19 December 2006 laying down methods of sampling and analysis for the official control of dioxins and dioxin-like PCBs in certain foodstuffs (OJ L 364, 20.12.2006, 32)*
  - Common methods for sampling and analysis ensure harmonised enforcement of legislation across the European Union and comparability of the results
  - http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_364/l_36420061220en00320043.pdf

– *Commission Directive 2002/70/EC of 26 July 2002 establishing requirements for the determination of levels of dioxins and dioxin-like PCBs in feedingstuffs*
  - Common methods for sampling and analysis ensure harmonised enforcement of legislation across the European Union and comparability of the results
  - http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_209/l_20920020806en00050014.pdf

Restriction of marketing and uses.

Council Directive 85/467/EEC of 1 October 1985 amending for the sixth time (PCBs/PCTs) Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations

ANNEX II

LIFE projects on Dioxin, Furans and Polychlorinated Biphenyls (PCBs)

- Ctrl-Click on the  icon to see the summary of the project and contact info
- Ctrl-Click on the project title to see the project's web site (if it exists)
- Ctrl-Click on the  icon to see the Layman's Report

Project reference	Title	Keyword(s)
LIFE04 ENV/DE/000041 	PCB Transformer Decontamination for Re-Use, and Decontamination of other PCB waste, with small-scale semi-mobile facilities, applied in pilot countries Poland and Greece (TrafoDecon)	Decontamination of PCB transformers for re-use Replacement of PCBs with safer alternatives Electricity generation
LIFE04 ENV/SE/000770 	Converting Wastes into Secondary Raw Materials : an innovative method for material recycling of underground cable and condenses containing oil	Polychlorinated biphenyls (PCB's)
LIFE03 ENV/IT/000321 	Elimination of PCBs from the Food Chain through Bioremediation of agricultural superficies.	Polychlorinated biphenyls (PCBs) Bioremediation to avoid PCB spread into food products.
LIFE02 ENV/DK/000155 	Innovative demonstration project for chemical recycling of PVC waste through the use of thermal hydrylosis	Dioxins Thermal hydrolysis of PVC waste and the recycling of the reaction products
LIFE98 ENV/IT/000132 	Waste Based Reinforcing Materials.	Fly ash form waste incineration; Dioxins and Furans Transformation of municipal waste incineration ashes (MWI), vitreous fibres.
LIFE98 ENV/S/000476 	Shredder Waste Recycling	Automotive shredder fluff Material, energy and land fill space savings Removal of mercury and PCBs

ANNEX III

Projects on POPs funded in the Fifth and Sixth Frameworks of Research (FP5 [1998-2002] and FP [2002-2006])

POPS-RELATED PROJECTS FUNDED BY THE FIFTH FRAMEWORK PROGRAMME OF RESEARCH (FP5 – 1998-2002)

ACRONYM, PROJECT TITLE, EC CONTRIBUTION	MAIN RESULT(S)	MORE INFORMATION
CHEMICALS WITH (REPRO)TOXIC & DEVELOPMENTAL EFFECTS		
ANEMONE Assessment of neurobehavioural endpoints and markers of neurotoxicant exposures EC contribution €1M	▪ In the cohort of children examined in Faroe Islands, PCB concentrations averaged about 60% of the concentrations in their mothers; concentrations increased with the duration of the breastfeeding period ▪ Children with different degrees of prenatal exposure to methylmercury and PCBs and other halogenated organic pollutants have been examined at age 7 years, and performance on neurobehavioural tests decreased at higher prenatal methylmercury exposures ▪ Brominated flame retardant concentrations showed substantial increases in milk and serum, when compared to samples collected in 1987 and 1994 ▪ Methods for determining biochemical markers of neurotoxicity were optimised. The effects on these biomarkers caused by methylmercury and halogenated organic pollutants and their combinations were determined in experimental studies ▪ Cholinergic muscarinic receptors of the brain constitute a sensitive biochemical endpoint altered by developmental exposure to methylmercury and PCB-153	▪ www.anemone-project.dk ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_anemone_en.pdf
BEEP Biological effects of environmental pollution in marine coastal ecosystems EC contribution €4M	▪ Development of biomarkers able to evaluate pollutant effects on the reproductive health of mussels and fish ▪ Selection of a standardised battery of biomarkers for implementation of biomarker techniques in national/international monitoring programmes (OSPARCOM, HELCOM)	▪ No project website ▪ Final report: http://ec.europa.eu/research/endocrine/pdf/beep_en.pdf
BIOCET	▪ POP levels in female common dolphins were shown to be linked to diet, area and	▪ www.abdn.ac.uk/biocet

Bioaccumulation of persistent organic pollutants in small cetaceans in European waters: transport pathways and impact on reproduction EC contribution €1.2M	reproductive status ▪ POP concentrations above the threshold at which effects on reproduction would be expected were routinely recorded in harbour porpoises from the southern North Sea (where high levels of POPs were also recorded in fish) and in common dolphins from the French and Galician coasts	▪ Final report: http://ec.europa.eu/research/endocrine/pdf/evk3-2000-00027-final-pr-rep_en.pdf

COMPARE Comparison of exposure-effect pathways to improve the assessment of human health risks of complex environmental mixtures of organohalogens EC contribution €1.9M	▪ Conclusions from the integrated and comparative risk assessment: There is presently sufficient margin of safety for brominated HPCs and current background exposure levels of human individuals to brominated HPC does not pose any risk for adverse health effects ▪ In terms of sources of exposure to hydroxylated PCBs, it is estimated that the main source of exposure would be the internal production by metabolism of the parent PCB congeners. The possible sources of external exposure are limited to eggs, liver, or liver products, blood, or blood products, due to the specific distribution pattern of hydroxyl-PCBs ▪ When considering a summing-up of chlorinated HPCs as µgT4-EQ/g lipid in cord serum, there is only a small margin of safety left of about a factor 45 for children born to mothers exposed to background levels of HPCs. This margin of safety does probably not exist when considering human individuals, in particular children, living in high exposure areas ▪ The study does not support that an additional risk for adverse health effects can be expected at current background exposure levels of the brominated HPCs investigated in human individuals	▪ www.compare-project.info ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report-compare_en.pdf
COMPRENDO Comparative research on endocrine disrupters – phylogenetic approach and common principles focussing on androgenic/antiandrogenic compounds EC contribution €3.3M	▪ The investigations on food contamination with pesticides, organochlorines and organotin compounds of the participating European countries revealed that in none of these cases an exceedance of Acceptable Daily Intake values was observed taking into consideration national eating habits ▪ Androgen mimicking substances, such as organotins and some pesticides, resulted in human-relevant models and sentinel aquatic wildlife species in the induction of virilisation, a reduced reproductive performance, an accelerated sexual maturity, reduced larval development, reduced skeletal density, misaligned sex ratios, changes	▪ www.comprendo-project.org ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_comprendo_en.pdf

	in sex steroid titres and enzyme activities and various effects on reproductive organs under histopathological investigation The observed effect concentrations were in the range of environmentally relevant concentrations and partially resulted in new Predicted No Effect Concentration-values for risk assessment	

ENDISRUPT Identification of critical rat testicular genes altered after foetal androgenic disruption by flutamide: use of DNA microarray EC contribution €1.7M	▪ In utero exposure to anti-androgens induces long-term programmed cell death of testicular germ cells ▪ At the doses of flutamide tested, no alteration in adult testis weight or histology is observed, although an increase in germ cells apoptosis is evident ▪ A list of testicular genes the expression of which is altered (microarray approach) has been produced ▪ Androgens have a role in foetal programming of germ cell fate at adulthood, suggesting a health risk associated with foetal exposure to anti-androgenic endocrine disrupters	▪ http://lotus5.vitamib.com/hnb/endisrupt/endisrupt.nsf/Web/Frame?openform ▪ ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_endisrupt_en%20.pdf ▪
ENDOMET Dysregulation of endogenous steroid metabolism potentially alters neuronal and reproductive system development: effects of environmental plasticisers EC contribution €1.5M	▪ The plasticisers and phenols tested were shown to act on steroid receptors (oestrogen, androgen, AhR, thyroid) and act non-genomically by inhibiting steroid sulphation, formation of sulphate and steroid synthesis. They also modulated cell signalling and intra-cellular transport and affected rat reproductive function in vivo ▪ Both plasticisers and phenols were shown to up-regulate certain human genes while down-regulating the expression of many more ▪ The project succeeded in providing in vitro test protocols to identify compounds with endocrine disrupting capacity. These are being patented to give systems which will be compatible with the REACH regulation	▪ No project website ▪ Final report available on the web
ENV REPROD HEALTH Increasing incidence of human male reproductive health disorders in relation to environmental effects on growth- and sex steroid-induced alterations in	▪ Significant differences in sperm quality in the participating countries exist ▪ The contrast between Denmark and Finland is striking, which also is reflected in the incidence of testicular cancer in the two countries ▪ Standardised Danish and Finnish mother-child cohorts demonstrated that the incidence of congenital malformations of the male genitalia is much higher in Danish newborn boys than in Finnish ones ▪ Clinical and biochemical data, medical history and questionnaire data on life-style	▪ No project website ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_envir_reprod_health_en.pdf ▪

programmed development EC contribution €2.7M	factors collected in a central database are currently being analysed for possible risk associations ▪ The hypothesis of a testicular dysgenesis syndrome (TDS) has been proposed	

EXPORED Multi-organic risk assessment of selected endocrine disrupters EC contribution €2.3M	▪ The finding of a generally higher exposure of the Danish boys to environmental pollutants with endocrine disrupting effects supports the hypothesis that exposure to these compounds during foetal development may play a causative role in the higher incidence of cryptorchidism and hypospadias in Danish newborns compared to Finnish newborns ▪ Preliminary data evaluation indicates that PBDE exposure is associated with an increased risk of cryptorchidism, whereas dioxin and PCB exposures results are equivocal ▪ Among the halogenated hydrocarbons, persistent pesticides, and phthalates analysed no significant association between cryptorchidism and the individual compounds was evident ▪ A combined statistical analysis of the eight most abundant persistent pesticides show that pesticide levels in breast milk in general are significantly higher in the boys with cryptorchidism than in the healthy boys	▪No project website ▪Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_eurisked_en.pdf ▪http://www.reproduction.dk/nafa2005/menu.htm ▪
FIRE Risk assessment of brominated flame retardants as suspected endocrine-disrupters for human and wildlife health EC contribution €4.8M	TBBPA affects the thyroid (T4 decrease in male and female offspring), accompanied by neurobehavioural changes, Dose-related effects of HBCD on the thyroid hormone axis in females, TBBPA in fish: skewed sex ratio, TBBPA in fish: skewed sex ratio (Final report to become available at the end of January 2007)	▪ www.rivm.nl/fire

GENDISRUPT Genetic markers and susceptibility to the effects of endocrine disruptors during mammalian testis development EC contribution €1.1M	▪ The project analysed, from genetic point of view, the effect on testicular cells of a group of selected endocrine disrupters and the genetic susceptibility to their action ▪ Microarray analysis of gene expression: more than 3 million individual gene data have been analysed ▪ Mono esther phthalate (MEHP) shows the highest level of deregulation; induces deregulation when supplied to mothers during embryogenesis ▪ The highest deregulation affects mice exposed to the different EDCs during entire	▪ http://gendisrupt.cib.csic.es ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_gendisrupt_en.pdf

	life period until analysis (4 weeks postnatal) ▪ Long-term exposure to MEHP and lindane: "low dose effect" detected ▪ Effects of different EDCs during testis development do not follow the same pathways at the level of gene deregulation ▪ Some morphologically visible effects on the seminiferous epithelium seen in exposed animals ▪ Exposure to oestrogens during embryonic life may have profound effect on germ cell growth and differentiation ▪ An in vitro assay set up to identify and quantify estrogenic activity of E2 and EDs on foetal testis cells ▪ The findings in humans support a genetic basis of human male infertility ▪ *ESR1* gene implicated in male infertility	▪
INUENDO Biopersistent organochlorines in diet and human fertility. Epidemiological studies of time to pregnancy and semen quality in Inuit and European populations EC contribution €1.8M	▪ Consistent and coherent positive associations of exposure and fertility: Male and female serum concentrations of PCBs were related to reduced fertility among couples from Greenland but not among Caucasians ▪ In Caucasians high PCB exposure was associated with more than 50% increase of spermatozoa with sperm DNA damage. This effect was not seen in Inuits who generally presented with high level of sperm DNA integrity ▪ Consistent negative findings: Serum concentrations of DDE and xenobiotic steroid receptor activities were not related to female and male fertility. Furthermore, blood levels of POP markers and xenobiotic receptor activities in serum were not related to sperm count and morphology and no evidence was found that POPs interfere with the regulation of sperm apoptosis ▪ Other findings: The study revealed several associations between POP blood levels and male reproductive hormones as well as Y/X sperm chromosome ratio but strong heterogeneity between regions complicates the interpretation	▪ http://www.inuendo.dk/ ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_inuendo_en.pdf ▪
PBDE-NTOX Developmental neurotoxicity of polybrominated diphenyl-ethers: mechanisms and effects EC contribution €0.8M	▪ Gestational or early postnatal exposure of animals to the flame retardant PBDE significantly interfered with several neurobehavioural endpoints	▪ No project website ▪ Final results: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_pbde-ntox_en.pdf

		▪
PCBRISK Evaluating human health risk from low-dose and long-term PCB exposure EC contribution €1.1M	▪ Slovakian child cohort exposed to PCBs: significant associations between PCB serum concentrations and performances in sensomotor tests ▪ Effects on thyroid activity, tooth development and hearing observed	▪ http://www.pcbrisk.sk/ ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_pcbrisk_en.pdf ▪
CHEMICALS WITH MULTIPLE EFFECTS		
DIOXIN RISK ASSESSMENT Comprehensive risk analysis of dioxins: development of methodology to assess genetic susceptibility to developmental disturbances and cancer EC contribution €1.5M	▪ Cancer: a case-control study on soft tissue sarcoma in Finnish population did not show any increased risk of sarcoma associated with elevated dioxin concentration; this is in line with a previous finding in rats that cancer is likely to be a high-dose phenomenon ▪ Tooth defects: studies in victims of Seveso accident showed missing teeth and tooth deformities in those exposed as children, and tooth defects could be followed and explained mechanistically in animal experiments; they seem to be among the most sensitive effects of dioxins ▪ Genetic variation: very few polymorphisms or genetic variations from the main population as to dioxin sensitivity were found and this does not seem to be an important issue in human risk assessment, although high variability is seen among various animal species and strains ▪ Risk assessment: Dose-response studies and molecular studies have enabled to divide dioxin effects to dioxin I type and dioxin II type. Important implications for risk assessment, because dioxin I effects are low-dose effects and they follow a reasonably predictable dose range both between species and within species. They include developmental effects and several biochemical changes. Dioxin II effects are very variable between species and strains, but usually high dose effects, and they include wasting syndrome, liver damage, and probably cancer. An obvious implication is that developmental effects are more important for risk assessment than cancer	▪ No project website ▪ Final report: ▪ http://ec.europa.eu/research/endocrine/pdf/qlk4-ct99-01446.pdf ▪ ▪
ESTROGENS & DISEASE The impact of developmental	▪ No statistically significant morphological effects of oestrogen exposure in testis, ovary, prostate and brain and mammary gland were found	▪ http://www.niob.knaw.nl/EU-QLRT-2000-00305/index.htm

exposure to weak (environmental) estrogens on the incidence of diseases in target organs later in life EC contribution €1.6M	▪ General conclusion: inappropriate exposure to low dose oestrogens before birth can cause subtle (but long-term) changes in expression levels of specific proteins, of which the physiological consequences need to be further investigated	▪ http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_estrogens_and_disease_en.pdf ▪
EURISKED Multi-organic risk assessment of selected endocrine disrupters EC contribution €3.1M	▪ Endocrine disrupters act not only within the reproductive tract but also in many other organs of the organism including the immune system ▪ Many endocrine disrupters exert effects in the hypothalamo-pituitary-thyroid axis, which causes hypothyroidism in case of iodide deficient food supply ▪ Oestrogenicity of isoflavones may endanger mammary gland and uterus of postmenopausal women. They appear to have protective effects in male accessory sex organs such as the prostate ▪ Effects of anti-androgens in intact male animals were demonstrable. Exposure of male foetuses, newborns or babies to these anti-androgenic substances may be of concern, because it is known that androgens play an important role in imprinting brain structures at this early time of life ▪ UV-screens had oestrogenic effects and profound inhibitory effects within the thyroid gland to reduce thyroid hormone production ▪ Some endocrine disrupters were also active in the liver to modulate the production of high and low density lipoproteins (storage pools for cholesterol) and of triglycerides	▪ http://www.eurisked.org/ ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_eurisked_en.pdf ▪
CHEMICALS: RISK ASSESSMENT, TESTING & MODELS		
ACE Analysing combination effects of mixtures of estrogenic chemicals in marine and freshwater organisms EC contribution €2.4M	▪ Development of improved analytical methods to accurately determine the concentrations of steroid estrogens and xenoestrogens in water ▪ Optimisation of the design of mixture experiments, incorporating appropriate biostatistical analysis of data ▪ Demonstration that the concept of concentration addition can be used to accurately predict the effect of a mixture of environmental oestrogens. Predictability occurs across a range of in vitro and in vivo assays, and with different mixtures ▪ Evidence was obtained to show that non-oestrogenic chemicals can markedly impair assessment of oestrogenicity ▪ Mixtures of oestrogenic chemicals containing each chemical at a concentration too	▪ Final report: http://ec.europa.eu/research/endocrine/pdf/ace_final_report_summary_en.pdf ▪

	low to produce a significant effect can nevertheless produce significant, and predictable, effects ▪ Current risk assessment procedures, based on individual chemicals, may not be as protective of the environment and human health as they could, and ought, to be ▪ A guidance document about the principles of testing mixtures of chemicals, with an emphasis on whether or not effects occur when each chemical is present at low (or no) effect concentration ▪ Validated prediction concepts for the effects of mixtures of estrogenic chemicals ▪ A report on the degree of concordance between the results from in vitro and in vivo assays	
BONETOX Bone development and homeostasis – critical targets in toxicology. Research to support test-method development and human-health risk assessment for dioxins and other endocrine-disrupting compounds in the food chain EC contribution €2.8M	The project, to end in 2007, is expected to produce significant new information on: ✓ The mechanisms of chemically induced bone toxicity as well as factors that affect individual sensitivity to this novel endpoint of endocrine toxicology ✓ The mechanisms of chemically induced embryo toxicity, with special emphasis on effects on epithelial-mesenchymal interactions, budding and branching morphogenesis, sensitivities of different organs and altered retinoid metabolism ✓ The specific roles of the retinoid, oestrogen, and AhR signalling pathways in mediating the effects of the selected EDCs ✓ Chemically induced alterations in gene and protein expression profiles, and identification of novel EDC-regulated genes and proteins ✓ The biological basis of species and strain variation in EDC-induced bone and embryo toxicity, and hormonal disruption ✓ The mechanisms and structural requirements for EDC-induced bone toxicity in vitro ✓ The contribution of EDC-exposure and hormonal disruption to the increasing incidence of osteoporosis and other bone disorders in the Western world	▪ http://www.imm.ki.se/bonetox/ ▪ Final report will be available at the end of 2007
EASYRING Environmental-agent susceptibility assessment utilising existing and novel biomarkers as rapid non-invasive testing methods	▪ Comparison of fish populations, sediment and water samples from a non-polluted and polluted section of River Lambro in Italy: Bisphenol A found at higher levels than other chemicals ▪ Fish sampled in polluted section showed a trend towards increasing plasma levels of vitellogenin (VTG - biomarker for oestrogenicity), altered steroid plasma levels and morphological alteration of gonads and liver	▪ http://www.easyring.org/ ▪ Final report available on the web

EC contribution €1.9M	▪ Total extracts of the water and sediment were either oestrogenic or anti-androgenic in vitro assays ▪ Juvenile fish exposed to '1x Lambro mixture' for five months: Increase in plasma VTG, alteration of gonad differentiation, gonad morphology, sex ratio and steroid ratio ▪ Several genetic biomarkers of exposure identified in exposed Xenopus laevis ▪ New non-invasive system for the detection of the exposure to endocrine disrupters developed: vitellogenin can be detected in carp mucus using a lateral-flow immunoassay (dipstick assay) performed within a few minutes of sampling ▪ Development of models (QSARs) for the prediction of the endocrine disruption capability of compounds	
EDEN Endocrine disrupters: exploring novel endpoints, exposure, low-dose and mixture effects in humans, aquatic wildlife and laboratory animals EC contribution €8.6M	▪ EDEN is striving to determine whether the current hazard and risk assessment strategies currently in place in the European Union are sufficient to deal with the issues of endocrine disrupters or require revising. The results of exposure assessment and mixture studies undertaken will help EDEN to assess how this data can be taken into consideration in testing guidelines and risk assessment procedures for wildlife and humans ▪ Initial results from chemical analyses have revealed the presence of multiple endocrine disrupters in human and fish tissue specimens ▪ The effects of endocrine disrupters are not restricted to the reproductive system but involve multiple targets, including cell signalling and the nervous system ▪ Phthalates, widely used as plasticizers, are capable of inducing many effects in vivo that characterize the testicular dysgenesis syndrome observed in humans. These effects arise early in foetal life ▪ Analyses of semen quality were extended to Central Europe. New data indicate that poor semen quality is widespread in young men. In some areas of Europe, semen quality has approached crisis levels that may impair human reproduction ▪ Experiments designed to assess the effects of low doses of endocrine disrupters in cultured cells, fish and rodents are completed. Unusually-shaped dose-response curves were not observed but the work highlighted the weakness of customary approaches for estimating low dose effects ▪ Significant progress has been made with mixture studies. The effects of a four-	▪ http://www.edenresearch.info/ ▪ Final report will be available at the end of 2007

	component mixture on zebra-fish and of a three-component mixture on male sexual differentiation in the rat could be successfully predicted by using the concept of dose addition. The mixture led to disruption of male sexual differentiation at doses of the components that individually did not induce observable effects. These observations are of great importance for the regulation of endocrine disrupters in the EU	
EDERA Development and implementation of new in vivo and in vitro systems for the characterisation of endocrine disruptors EC contribution €0.7M	▪ Major advantages of the use of reporter animal technology with respects to the currently available model systems shown: ✓ Reporter mouse technology is a candidate to replace the existing tests that, for their nature, are unable to provide a global view of estrogenic activity in the whole organism ✓ It reduces the number of animals to be used in the in vivo tests by means of non-invasive in vivo imaging technology and provides the unique opportunity to follow endocrine effects in time in the same animal ✓ It refines current methods by providing for the first time the possibility to observe study the effect of endocrine disrupters systemically and after long term exposure even to low doses, for animal testing our methodology will nullify the pain for the test and abolish the necessity of animal sacrifice	▪ http://www.edera.unimi.it/index.htm ▪ Final report available on the web
MENDOS Biomimetic optical sensors for environmental endocrine disruptor screening EC contribution €2M	▪ Main technological developments in the field of biomimetic and biological sensor systems for endocrine disrupters achieved ▪ Although one of the main goals to establish a fully functional molecularly imprinted polymers (MIP)-based optical sensor platform for endocrine disrupter monitoring in the aqueous environment could not be reached completely, major advances in underlying MIP technology and optical sensor equipment were made, thus setting the base for successful future implementation of highly sensitive biomimetic optical sensors ▪ MIP-based solid phase extraction materials were obtained that could significantly facilitate instrumental analysis of endocrine disrupters in environmental samples ▪ Biological sensors and assays for endocrine disrupters were established, which – after further validation – are prospectively useful tools for high-throughput laboratory based or in-the-field endeavours of screening for endocrine disrupting activity	▪ http://www.mendos.org/ ▪ Final report available on the web
PLUTOCRACY Placental uptake and transfer	▪ A significant regional difference in prevalence of maternal atopy exists whether atopy was defined on the basis of allergic history alone, sIgE alone, or a combination	▪ http://www.bris.ac.uk/plutocracy/

of environmental chemicals relating to allergy in childhood years EC contribution €1.6M	of both ▪ Concentrations of toxic metals (Pb and Cd) in maternal blood and placental samples show a positive correlation, suggesting that the placenta can be a bioindicator of (maternal) exposure ▪ There was a significant correlation between concentrations of the organochlorine insecticides in each of the biological matrices, of which the most abundant was DDE ▪ Cord blood IgE positivity was most strongly associated with high maternal education level, residence in a city during pregnancy, living in a house and exposure to agricultural chemicals. Multivariate analysis only showed an association of elevated CB IgE for residence in a city and for having father or other smokers at home ▪ Placental contamination with organochlorine insecticides (DDT, DDE, gamma-HCH, alpha-HCH, beta-HCH) and 1,3,5-TCB (chlorinated biphenyl) was significantly associated with CB IgE positivity ▪ In utero environmental exposure to toxic metals and organochlorine insecticides influences immune function in placental tissue, maternal and cord blood ▪ Xenobiotic compounds cross the placenta in vivo and accumulate in foetal organs Elevated concentrations, compared with maternal concentrations, were seen in key foetal organs such as blood, spleen, bone-marrow, brain and liver ▪ When evaluated at 18 months of age, sensitisation in children was lower than expected compared with other studies. This may be due to the fact that the majority of subjects were from Eastern Europe and also because of the particularly young age of our cohort at evaluation ▪ In contrast with sensitisation, the highest incidence of allergy symptoms (atopic eczema, asthma) was found in Belgium, which is in accordance with prevalence of maternal atopy. Predictors for atopic eczema included allergy to cow's milk or other foods, recent ill health such as 'flu or recent fever, cough, runny nose, day-care outside the home. Asthma symptoms do not generally become evident until later in childhood, so it will be important to undertake a further follow-up of the cohort at a later stage	▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_plutocracy_en.pdf (This the report for the final period, not covering the entire project duration)
AIR POLLUTION AND GENOTOXIC/CARCINOGENIC EFFECTS		
EXPAH Effects of PAHs in	▪ 350 human volunteers in Czech Republic, Slovakia and Bulgaria studied ▪ PM_{10} levels were higher in winter compared to summer in all three locations	http://www.le.ac.uk/biochem/pbf1/EXPAH.html

environmental pollution on exogenous and endogenous DNA damage EC contribution €1M	▪ Concentration of carcinogenic PAHs was at least 10 fold higher in winter than summer ▪ For the whole population, total bulky DNA adducts and B(a)P DNA adducts were significantly more abundant in the exposed group compared to the control group, and in smokers compared to non-smokers ▪ Changes in oxidative DNA damage products were observed at statistical significance between the exposed and control groups for 8-oxodG in Kosice and M1dG in Sofia ▪ The country of origin of the samples was associated with total DNA adducts, and B(a)P adducts levels, independently from other possible confounding factors Fluorescent in situ hybridisation (FISH) was more sensitive than conventional cytogenetic methods as a biomarker of effect ▪ GSTP1 polymorphism was significantly associated with FISH. Genetic polymorphism of GSTM1 affected the B(a)P adduct in the whole population. Effects of polymorphisms of GSTT1, CYP1A1, and XPD repair gene were seen on some biomarkers of exposure or effect, or of oxidative damage, in subgroups from individual countries ▪ Environmental exposure to PAHs significantly influenced the repair process of DNA damage induced by X-rays in the subject's lymphocytes	▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_expah_en.pdf ▪
MULTIPLE STRESSORS/FACTORS AND HEALTH		
EPILYMPH Environmental exposures and lymphoid neoplasms EC contribution €1.1M	▪ Increased lymphoma risk for subjects that were in contact with meat, in particular beef ▪ Occupational exposure to inorganic pesticides: increased risk of lymphoma ▪ No association between occupational artificial ultraviolet radiation exposure and lymphoma risk ▪ Being outside in the sun during childhood for more than 6 hours associated with a statistically significantly increased risk of 1842 non-Hodgkin lymphomas (NHL) ▪ Red hair colour conferred an increased NHL risk ▪ Decreased risk of lymphoma for repeated diarrhoea and an elevated risk for hepatitis B and mononucleosis ▪ Decreased risk of lymphoma for diabetes, hypertension, asthma and arthrosis ▪ A significant decrease of lymphoma risk was also observed for history of food	▪ No project website ▪ Final report: http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_epilymph_en.pdf ▪

	allergy ▪ Regular statin (hypolipidemic agent lowering cholesterol) use was associated with a lymphoma risk reduction ▪ The investigation of tobacco smoking did not reveal any association with the risk of NHL, HL or histological subtypes	
GEOPARKINSON Parkinsonism and Parkinson's disease EC contribution €1.1m	Main findings were as follows: ▪ Analyses showed statistically significantly increased odds ratios for Parkinson's disease with an exposure-response relationship for pesticides ▪ A history of ever having been knocked unconscious was associated with an increased risk of the disease with an exposure response relationship ▪ We did not find a significant association between metal exposure (iron, copper, manganese) and Parkinson's disease ▪ Use of anti-depressants, sleeping tablets or medicines for anxiety was associated with an increased risk of Parkinson's disease ▪ Smoking reduced the risk of Parkinson's disease ▪ There was a modest but significant association between monoamine oxidase A (MAO-A) polymorphism in males and Parkinson's disease risk ▪ Most gene-environment interaction analyses did not show significant effects ▪ There was a possible interaction between GSTM1 null genotype and solvent exposure that was stronger when limited to cases with Parkinson's disease	http://www.abdn.ac.uk/deom/newsgeop.shtml ▪ Final report: ▪ http://ec.europa.eu/research/quality-of-life/ka4/pdf/report_geoparkinson_en.pdf ▪
PINCHE Policy interpretation network on children's health and environment EC contribution €1M	▪ Thematic network analysing studies related to children's health and environment (EU Fourth and Fifth Framework of Research projects; nationally funded studies) ▪ Policy-relevant recommendations and identification of research gaps related to children, health and the environment ▪ Focus on air pollution, cancer, neuro-toxicity, noise ▪ Conclusions: ✓ Reducing exposure to most of the air pollutants related to motor-vehicle transport, including benzene, diesel engine emissions, nitrogen oxides and particulate matter, has the highest priority in protecting children's environment and health ✓ Reducing exposure to environmental tobacco smoke, a fully preventable exposure, also has high priority because of high exposure and serious health	▪ Final results and reports available at http://www.pinche.hvdgm.nl/

	effects ✓ The priority of reducing allergic symptoms is considered to be medium to high, because allergens are ubiquitous and millions of children in Europe are sensitised to allergens. Exposure of sensitised children to allergens greatly affects their daily performance ✓ Reduction of exposure to ozone, another outdoor air pollutant, has medium priority. It is of specific importance for a susceptible group of children, those with asthma, in relation to outdoor activities ✓ Reducing exposure to polycyclic aromatic hydrocarbons, which mainly originate from vehicle emissions and smoking has medium priority, it can negatively influence the development of the foetus ✓ Exposure to the metals arsenic, lead, cadmium and mercury has a medium to high priority for action. Exposure to these metals has decreased, but some sources or settings still cause enough exposure to produce negative health effects ✓ The indoor exposure to mould, radon, formaldehyde and other volatile organic compounds (which also occurs outdoors, but indoor concentrations can reach especially high levels) also has medium priority for action. For each of these stressors, situations can be identified in which children can be exposed to high concentrations. Relevant indoor levels can cause adverse health effects	

POPS-RELATED PROJECTS FUNDED BY THE SIXTH FRAMEWORK PROGRAMME OF RESEARCH (FP5 – 1998-2002)

Projects focused on carrying out reviews of previous research accomplishments

Project acronym and title	Main aims and expected outcome	Policies addressed	Date of delivery of results	More information
HENVINET Health and environment network	• Establish expert teams for each of the four priority diseases of the Environment and Health Action Plan (including endocrine disrupting effects), which shall extract and summarise the current scientific basis regarding the links between health and environment and best practices of applying this knowledge, and prepare policy relevant material for dissemination to decision makers and other stakeholders • Ensure efficient dissemination of all material resulting from the project activities (research results of policy relevance, policy relevant summaries, best practice, decision support tool descriptions), to be uploaded into a dynamic web-based information system and be made available to stakeholders outside the project, for review and to promote discussion with the scientific community • Select a number of key and relevant areas of relations between health end points and sources of environmental exposure (cause-effect chains), where decision support tools have been developed or suggested • Develop plans for validation studies in these subject areas, as well as actively work towards	Environment and Health Action Plan	First results will be available at the earliest in 2008	Project negotiations recently finished – no website yet

	the wider use of such tools, to support development of new policies • Identify relevant ongoing and recently completed research projects focused on decision support tools			

FP6 projects focused on neuroimmune disorders

Project acronym and title	Main aims and expected outcome	Policy addressed	More information
CASCADE Chemicals as contaminants in the food chain: a NoE for research, risk assessment and education	• Provide novel information on the mechanism of action of contaminants in food that interfere with nuclear receptor signalling pathways (Focus on 4 model compounds [genistein, vinclozilin, bisphenol A and TCDD)] • Develop in vivo, in vitro and in silico test methods to screen for the potential of a broad range of chemical residues in the food, including food extracts and mixtures and metabolites of chemical residues • Identify exposure biomarkers • Provide mechanistic information regarding disease development (disruption of neurodevelopment or interference with the development and functioning of male or female reproductive systems, hormonally dependent cancer in prostate and breast, colon cancer, metabolic diseases and osteoporosis)	• European strategy for Sustainable Development • The Community Strategy on Endocrine Disrupters • Community strategy for dioxins, furans and polychlorinated biphenyls (2001/C 322/02) • Registration, Evaluation and Authorisation of Chemicals (REACH) • Council Regulation (EEC) No 315/93 on food contaminants • Commission Directive 2002/72/EC, amended by Com. Dir. 2004/19/EC (concerns bisphenol A) • Pesticide legislation: Directive 91/414/EEC, Directive 79/117/EEC • Regulation (EC) No 850/2004 of the European Parliament and of	www.cascadenet.org

		the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC • European Pollutant Release and Transfer Register (Regulation (EC) No 166/2006 • Legislation on food contaminants: Council Regulation (EEC) No 315/93	
PIONEER Puberty onset – influence of nutritional, environmental and endogenous regulators	• Obtain updated data on the age of puberty onset in the different regions of Europe • Identify genetic and nutritional factors involved in the regulation of the onset of puberty (including certain endocrine disrupters) • Develop novel experimental models, optimised for the investigation of genetic and nutritional factors regulating onset of puberty • Define if specific preventive actions could be taken within EU	• European strategy for Sustainable Development • The Community Strategy on Endocrine Disrupters • Registration, Evaluation and Authorisation of Chemicals (REACH)	http://cascade.projectcoordinator.net/~pioneer
FOOD AND FECUNDITY Pharmaceutical products in the environment: Development and employment of novel methods for assessing their origin, fate and effects on human fecundity	• Develop and employ validated methods for the screening and testing of pharmaceutical products (mainly oestrogens, androgens and progestogen-like compounds) and their metabolites • Determine their adverse effects, origin, fate, and mechanism of action • Assess their risk on male and female fecundity in various geographical locations and exposure scenarios in Europe.	• European strategy for Sustainable Development • The Community Strategy on Endocrine Disrupters • Registration, Evaluation and Authorisation of Chemicals (REACH) • Council Regulation (EEC) No 315/93 on food contaminants	http://foodandfecundity.factlink.net/
DEVNETOX In vivo and in vitro studies on the neurotoxic effects of	Develop experimental models to improve predictive toxicity testing and mechanism-based risk assessment for neurotoxic food contaminants	• European strategy for Sustainable Development • The Community Strategy on Endocrine Disrupters	http://www.imm.ki.se/devnertox/

mixture of neurotoxic seafood contaminants		• Community strategy for dioxins, furans and polychlorinated biphenyls (2001/C 322/02) • Registration, Evaluation and Authorisation of Chemicals (REACH) • Council Regulation (EEC) No 315/93 on food contaminants • Community Strategy Concerning Mercury • European Pollutant Release and Transfer Register (Regulation (EC) No 166/2006	
ATHON Impact of non-dioxin-like PCBs on neurobehavioural, reproductive and developmental toxicity, and tumour promotion	• Provide missing critical health hazard information, to clarify biological mechanisms underlying the various types of toxicity of NDL-PCBs and to evaluate these data from a regulatory toxicology point-of-view • Establish quality-controlled experimental in vivo and in vitro models for studies of NDL-PCBs • Provide toxicokinetic data for NDL-PCBs • Provide quantitative and qualitative toxicity profiles for NDL-PCBs • Provide a new classification strategy for NDL-PCB congeners based on effect biomarker information • Provide an up-to-date compilation and evaluation of toxicological effect and exposure data on NDL-PCBs and PCB metabolites	• European strategy for Sustainable Development • The Community Strategy on Endocrine Disrupters • Community strategy for dioxins, furans and polychlorinated biphenyls (2001/C 322/02) Registration, Evaluation and Authorisation of Chemicals (REACH) • European Pollutant Release and Transfer Register (Regulation (EC) No 166/2006 • Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC	www.athon-net.eu
EXERA	Development of transgenic animals to test for endocrine disrupting	• European strategy for Sustainable	

Development of 3D in vitro models of estrogen-reporter mouse tissues for the pharmaco-toxicological analysis of nuclear receptors-interacting compounds (NR-ICs)	compounds	Development • The Community Strategy on Endocrine Disrupters • Registration, Evaluation and Authorisation of Chemicals (REACH)	

Projects focused on cancer

PROJECT ACRONYM AND TITLE	MAIN AIMS AND EXPECTED OUTCOME	POLICY ADDRESSED	MORE INFORMATION
NEWGENERIS Maternal exposure to geno- and immunotoxic compounds: induction of carcinogenic and immunotoxic events in the unborn child; risk of cancer and immune disorders in later childhood	• Hypothesis to be tested: Maternal exposure to certain compounds results in in utero exposure and subsequently induces carcinogenic and immunotoxic events in the unborn child, thereby leading to increased risk of cancer and immune disorders in later childhood • Biomarker approach: (i) biomarkers of dietary exposure to chemicals with carcinogenic and associated immunotoxic properties (focus on PAHs, acrylamide, mycotoxins, organochlorines, heterocyclic amines…); (ii) biomarkers of pre-carcinogenic and immunotoxic effects • Dietary exposures of mothers and fathers obtained using existing European mother-child birth cohorts • The project will consider the impact of endocrine disrupters, by studying exposure to and immunotoxic properties of some well-known hormone-active agents such as dioxin and PCBs	• EU pesticide legislation • Council Regulation (EEC) 315/93 on food contaminants • Directive 2002/32/EC of the European Parliament and of the Council of 7 May 2002 dealing with undesirable substances in animal feed • European strategy for Sustainable Development • Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC	www.newgeneris.org

ECNIS Environmental cancer risk, nutrition and individual susceptibility	• A concerted effort to achieve improved understanding of the environmental causes of cancer • The potential of diet to prevent cancer • The ways by which heredity can affect individual susceptibility to carcinogens • Will focus on the utilisation biomarker-based technologies to approach these goals (new biomarkers as well as the application of existing and new biomarkers) • Optimal use of existing European cohorts and biobanks; population-based studies from different regions of Europe with different climates, pollution levels and dietary habits	• European strategy for Sustainable Development • Registration, Evaluation and Authorisation of Chemicals (REACH) • EU Thematic Strategy on air pollution • Ambient Air Quality Framework Directive 96/62/EC	www.ecnis.org
DIEPHY Dietary exposures to polycyclic aromatic hydrocarbons and DNA damage	• Levels of DNA adducts in non-smoking women (Poland, Serbia and Italy) • Genetic polymorphisms in main activating and detoxifying enzymes • Impact on DNA adducts, oxidative lesions and chromosome damage from food and environmental PAH exposures in persons living in the vicinity of Serbian petrochemical complexes (extremely polluted areas in the Balkans) • Synergistic effects of simultaneous exposure to PAHs and As in drinking water • Validate biomarkers (buccal cells)	• European strategy for Sustainable Development • Registration, Evaluation and Authorisation of Chemicals (REACH) • EU Thematic Strategy on air pollution • Ambient Air Quality Framework Directive 96/62/EC	www.imp.lodz.pl/diephy/diephy.htm
EUROLYMPH Collaborative European action into environmental, nutritional and genetic factors in non-Hodgkin's lymphoma aetiology	• Develop a network of studies to investigate the association between environmental risk factors and NHL with the specific objective to conduct a detailed investigation of environmental and nutritional risk factors previously suggested to be associated with NHL on the pooled data from the studies participating in the InterLymph consortium • Produce results on risk of NHL for exposure to different categories of pesticides and solvents, organic dusts, ultraviolet radiation, and contact with animals and animal related products, and on their interplay with genetic susceptibility factors.	• Programme of Community action in the field of Health and Consumer protection 2007-2013	N.A.

Projects on methods for integrated risk assessments of cumulative stressors

Project acronym and title	Main aims and expected outcome	Policy addressed	More information
NOMIRACLE Novel methods for integrated risk assessment of cumulative stressors in Europe	• Develop a research framework for the description and interpretation of cumulative exposures and effects • Develop new methods for assessing the cumulative risks from combined exposures to several stressors (including mixtures of chemical and physical/ biological agents) • Achieve more effective integration of the risk analysis of environmental and human health effects • Quantify, characterise and reduce uncertainty in current risk assessment methodologies • Develop assessment methods which take into account geographical, ecological, social and cultural differences in risk concepts and risk perceptions across Europe	• European strategy for Sustainable Development • Registration, Evaluation and Authorisation of Chemicals (REACH)	http://nomiracle.jrc.it/
INTARESE Integrated assessment of health risks from environmental stressors in Europe	• Improve scientific support for policy on E&H, the immediate priority should not be on investigating individual causal associations between E&H, but rather on improving the use made of the data and knowledge that we already have in order to obtain more integrated assessments of risks and impacts. • Develop a conceptual framework within which to bring together the latest scientific evidence across all the relevant environmental sectors and disciplines as a basis for integrated assessment of both environmental and health impacts and risks • Build an operational toolbox for integrated assessment that can be applied to different stressors and environmental media (air pollution, water pollution, climate change etc), settings (ambient, domestic, occupational) and agents (chemicals, solid wastes, natural hazards, noise etc) • Apply this approach to undertake integrated assessments for a range of key policy areas, including transport, housing, agricultural land use, water management, household chemicals, waste management and climate	• European strategy for Sustainable Development • Registration, Evaluation and Authorisation of Chemicals (REACH) • EU Thematic Strategy on air pollution • Ambient Air Quality Framework Directive 96/62/EC • The transport, health and environment pan-European programme (THE PEP) • EC Integrated Environment and Health	http://www.intarese.org

		Information System for Europe (EHIS) • EU waste legislation (Directive 2006/12/EC)	
ENVIRISK Assessing the risks of environmental stressors: Contribution to the development of integrating methodology	• Identify and assess the available monitoring data and exposure models for realistic exposure assessment, and to analyse methods and models for their use in the analysis of relationships between environment, exposure and health • Develop protocols for exposure assessment and for assessment of exposure-health effect relationships, integrating the modelling of environmental releases, dispersion, human activity and physiology into an exposure modelling framework, and to provide interface between this exposure modelling framework and health effect modelling • Develop a framework for the assessment of relationships between exposure and health for selected pollutants including those that are subject to multimedia transport, to suggest protocols for such assessment and provide their economic appraisal • Pilot the exposure and risk modelling framework for three EC Environment and health Action Plan-relevant indicators: exposure to atmospheric PAH, multimedia PCBs, dibenzofurans and dioxins, and atmospheric particulate matter and other irritants relevant to respiratory morbidity and mortality • Contribute to the EC Integrated Environment and Health Information System for Europe (EHIS) through development of a prototype tool for exposure assessment	• EC Integrated Environment and Health Information System for Europe (EHIS) • Registration, Evaluation and Authorisation of Chemicals (REACH)	N.A.

Projects on health impact assessments and cost/benefit analyses

HEIMTSA Health and environment integrated methodology and toolbox for scenario assessment	• A methodology for health impact and cost benefit analysis, so that overall environment and health impacts caused by releases of substances into the environment from all relevant human activities can be evaluated at the European level, as reliably as practicable given current knowledge • A related modular integrated assessment system (IAS) for implementing the methodology Europe-wide, i.e. across the EU-30 (EU25 and Norway, Switzerland and the accession countries) • Results from using the IAS to apply the methodology for health impact and cost-benefit assessment of realistic policy scenarios at the European level • Development of HIA/CBA capability in Europe	• European strategy for Sustainable Development • Registration, Evaluation and Authorisation of Chemicals (REACH) • EU Thematic Strategy on air pollution • Ambient Air Quality Framework Directive 96/62/EC • The transport, health and environment pan-European programme (THE PEP) • EC Integrated Environment and Health Information System for Europe (EHIS) • EU waste legislation (Directive 2006/12/EC)	N.A.
2-FUN Full-chain and uncertainty approaches for assessing health risks in future environmental scenarios	• Provide decision-makers with powerful mechanistic tools to support the analysis of current and future trends in environmental conditions and pressures that cause health problems, and to evaluate and rank the management options of their risk factors • Development of methodologies for building and assessing future realistic environment and health scenarios • Development of methodologies allowing the integrated assessment of multi-stressors, multi-routes and multi-exposure for various target groups (especially children)	• Transport, energy, agricultural, food safety, air quality, soil protection and water protection policies • EU sustainable development strategy • REACH (Registration, Evaluation,	N.A.

	• Improvement and development of uncertainty models for further health management • Application of a full-chain approach for health risk assessment to specific case-studies of general interest to the EU • Dissemination of new methodologies and tools on a large scale (scientific community, policy-makers, industry, citizens), providing inputs for harmonised tools and European policy makers • A main breakthrough in the tools proposed by 2-FUN lies with the explicit accounting of uncertainty throughout the full mechanistic computation chain and with the possibility to functionally integrate different data classes, seamlessly crossing different time and spatial scales	Authorisation and restriction of Chemicals) • EC Integrated Environment and Health Information System for Europe (EHIS)	
METHODEX Methods and data on environmental and health externalities: harmonising and sharing of operational estimates	• Advance best practice in external cost assessment, and extend the ExternE analysis to agriculture, industry, waste and other sectors	• Clean Air for Europe (CAFÉ) Programme • UN ECE Convention on Long Range Transboundary Air Pollution (CLRTAP) Convention • EU waste legislation (Directive 2006/12/EC) • Ambient Air Quality Framework Directive 96/62/EC	http://www.methodex.org/
ESPREME Reducing the environmental impact of heavy metals	• Cost-effectiveness and cost-benefit analyses to identify strategies that will reduce both the release of heavy metals and, ultimately, their impact on the environment and human health	• Ambient Air Quality Framework Directive 96/62/EC • Aarhus Protocol on Heavy Metals • Water Framework Directive • EU Mercury Strategy	http://espreme.ier.uni-stuttgart.de/
DROPS	• Provide a full-chain analysis related to impact of health protection measures	• Clean Air for Europe	www.nilu.no/

Development of macro and sectoral economic models aiming to evaluate the role of public health externalities on society	related to priority pollutants as identified by the E&H Action Plan (ozone, heavy metals, PCBs, dioxins, indoor and outdoor pollution) • Support the development of cost effective policy measures against pollution related diseases and their wider impacts	(CAFÉ) Programme • Ambient Air Quality Framework Directive 96/62/EC • UN ECE Convention on Long Range Transboundary Air Pollution (CLRTAP)	DROPS
VERHI CHILDREN Coordination action on valuation of environment-related health impacts	• Improve the incorporation of environment-related health impacts in policy-making • Focus on two measures employed to examine environmental policies: the Value of a Statistical Life (VSL) estimated from willingness to pay for mortality risk reductions, and Quality-Adjusted Life Years (QALY)	Clean Air for Europe (CAFÉ) Programme	VERHI Children

Projects on risk/benefit analyses

Project acronym and title	Main aims and expected outcome	Policy addressed	More information
BENERIS Benefit-risk assessment for food: an iterative value-of information approach	• Develop and use integrated methods to evaluate both the risks and health benefits related to any given food item (in this project fish and vegetables)	• EU food contaminant legislation • Registration, Evaluation and Authorisation of Chemicals (REACH) • EU sustainable development strategy	http://www.beneris.eu/
QALIBRA Quality of life - integrated benefit and risk analysis.	• Develop quantitative methods for assessing and integrating beneficial and adverse effects of foods • Make them available to stakeholders as web-based software for assessing and communicating net health impacts		http://www.qalibra.eu/about/index.cfm

Web-based tools for assessing food safety and health benefits	• Focus on fish/functional foods		
BRAFO A specific support action to investigate the risk benefit analysis for foods	• Develop a framework that allows a quantitative comparison of human health risks and benefits of foods and food compounds, using a common scale of measurement		http://europe.ilsi.org/activities/taskforces/riskassessment/RiskAssessmentChemicals.htm
SAFEFOODS Promoting food safety through a new integrated risk analysis approach for foods	• To develop comparative safety assessment methods for foods produced by different breeding approaches and production practices, using modern profiling techniques, and new qualitative and quantitative risk-benefit (e.g. nutritional, economic) assessment models.		http://www.safefoods.nl/default.aspx

Projects on emerging environment and health threats

PROJECT ACRONYM AND TITLE	MAIN AIMS AND EXPECTED OUTCOME	POLICY ADDRESSED	MORE INFORMATION
HI-WATE Health impacts of long-term exposure to disinfection by-products in drinking water	• Determine the disinfection by-product composition and levels in drinking water in various regions in Europe • Develop predictive models • Assess the risk of premature birth, semen quality, stillbirth and congenital anomalies, including any gene-environment interactions where possible • Assess the risk of cancer (bladder, colon) • Conduct risk/benefit analyses including quantitative assessments of risk associated with microbial contamination of drinking water versus		

	chemical risk • Assess the policy implications of current disinfection practices		
SAFEFOODS Promoting food safety through a new integrated risk analysis approach for foods	• Development of a user-friendly, transparent, and easy to use working procedure for identification of new emerging chemical and microbial risks in food production chains	• EU food contaminants legislation • Registration, Evaluation and Authorisation of Chemicals (REACH)	
NORMAN Network of reference laboratories for monitoring of emerging environmental pollutants	• Establish a European network of reference laboratories, research centres and related organisations (including standardisation bodies) in order to improve the exchange of information on emerging environmental contaminants and to encourage the validation and harmonisation of common measurement methods and monitoring tools so that the demands of risk assessors and risk managers can be better met	• The CAFÉ process • Registration, Evaluation and Authorisation of Chemicals (REACH)	http://www.norman-network.com