

2000/60/EC integrated the provisions under 76/464/EEC and provides for the progressive reduction or cessation of discharges, emissions and losses of pollutants to water.

□ **Restrictions on marketing and use of chemicals :**

In 1985, the use of PCBs and PCTs was banned through Directive 85/467/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations.

□ **Shipment and disposal of PCB-containing waste**

Although PCBs and dioxins are identified as a hazardous waste in Council Directive 91/689/EEC the Commission has recognised the need for additional legislation on the disposal of PCB-containing waste, and has introduced such legislation : Council Directive 75/439/EEC on the disposal of waste oils set a maximum limit of 50 ppm for the PCB content of regenerated oil or oil used as fuel. The Council Regulation (EEC) No 259/93 sets strict control procedures for the shipment of PCB-containing waste, to avoid their illegal dumping. A specific Directive (96/59/EC) for the disposal of PCBs and PCTs aims at disposing completely of PCBs and equipment containing PCBs as soon as possible, and for big equipment before the end of 2010. This Directive sets the requirements for an environmentally sound disposal of PCBs. Member States have to make an inventory of big equipment containing PCBs, have to adopt a plan for disposal of inventoried equipment, and outlines for collection and disposal of non inventoried equipment (small electrical equipment very often present in household appliances manufactured before the ban on production of PCBs). The proposal for a Directive on Waste from Electric and Electronic Equipment, which is now being discussed by Council and the European Parliament, will certainly have a strong impact on the separate collection and environmentally sound disposal of electrical equipment containing PCBs, as it contains an explicit obligation of segregation of the hazardous components of electric and electronic equipment before any subsequent treatment is applied. The Directive on Landfill of Waste (99/31/EC) has resulted in a significant change in the volume and nature of waste accepted at Europe's landfill sites. It has also led to improvements in design and operating standards, as well as in the aftercare of new and existing landfills. Therefore it should achieve a significant decrease in the releases of PCBs in landfills.

□ **Animal nutrition**

As a consequence of two contamination incidents in the animal feed sector (citrus pulp pellets from Brazil with high dioxin contamination in 1998 and highly contaminated kaolinitic clay from certain mines in 1999) maximum limits have been established for dioxins in citrus pulp pellets and kaolinitic clay.

#### **4.2. International approach**

The international community has called for *urgent global actions* to reduce and eliminate the release of dioxins and PCBs. Therefore the Commission actively participates in a number of *relevant international activities*, of which the following are particularly worth mentioning :

- the 1990 declaration adopted by the *North Sea Conference* undertaking, inter alia, 70 % reductions of chlorinated dioxins;
- the revised Protocol of the *Barcelona Convention* for the protection of the waters of the Mediterranean from land-based sources, where dioxins are included in the list of substances to be controlled;
- The Joint *UNECE/WHO-ECEH<sup>5</sup> Task Force on Health Aspects of Long-Range Transboundary Air Pollution* organised meetings in order to initiate the preparation of the assessment on health risks of POPs from LRTAP;
- a new *exchange of letters between the Commission and the WHO* has been finalised beginning of 2000 to strengthen and intensify the framework of co-operation. During the EC/WHO seminar on co-operation on environment and health issues (Brussels, September 2000) WHO and the EC discussed possible future co-operation in the field of dioxins and PCBs and decisions were reached on concrete actions.

The European Community is also a ***Contracting Party to several Conventions*** with regard to dioxins and PCBs :

- The *Basel Convention* is designed to control the transboundary movements of hazardous waste and their disposal. PCBs and dioxins are classified as hazardous wastes.
- the *OSPAR Convention for the protection of the marine environment of the north-east Atlantic* agreed in 1998 on the objective to cease emission, discharges and losses of hazardous substances by 2020 in order to achieve “close to zero” concentrations of compounds such as dioxins/PCBs in the marine environment.
- The *Convention on the protection of the marine environment of the Baltic Sea Area* : the contracting parties declare to prohibit, totally or partially, the use of PCBs in the Baltic Sea and its catchment areas.
- The *UNECE POPs Protocol to the Convention on Long-Range Transboundary Air Pollution*, signed by the EU in Aarhus in June 1998, aims to control and reduce the emissions of a number of POPs which require the most urgent action, such as dioxins and PCBs.
- the *Stockholm Convention (POPs Convention)*, signed by the EU in May 2001 in Stockholm, aims to reduce the total release of dioxins, furans and PCBs, with the goal of their continuing minimization and, where feasible, ultimate elimination.

### 4.3. Gaps

Although a lot of progress has been achieved in reducing the releases of dioxins/PCBs in the environment, the following facts have been stated :

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<sup>5</sup> United Nations Economic Commission for Europe/World Health Organisation-European Centre for Environment and Health

- ***The target set in the 5<sup>th</sup> EAP will not be achieved*** : for the *industrial sources* a considerable emission reduction has been attained (based on current trends and activities it is foreseen that the target set in the 5<sup>th</sup> EAP of a 90% reduction will be nearly realised in 2005 compared to the levels in 1985) BUT, for the *non-industrial sources* (domestic solid fuel burning, domestic waste burning, fires, etc..) the rate of emission reduction is much lower. The relation between industrial and non-industrial sources is shifting towards growing importance of non-industrial sources.
- 1 Million tons of PCBs have been produced and used during the 20<sup>th</sup> century until their ban in 1985. The main part of these products, which are highly resistant to degradation (>30 years) and bioaccumulable in fat of biota, is now spread in soils, sediments and the whole aquatic ecosystem ("**Historical pollution**").
- Much ***equipment and material containing PCBs*** will be reaching in the coming years, if they have not done so yet, their ***waste stage***, and a correct disposal has to be ensured to avoid additional releases in the environment.

Therefore, and in combination with the new elements described in the introduction, there is a need to further address the problem in order to protect human health. To reduce *human intake* it is important to reduce the levels in the *foodchain* because food consumption is the most important route for human exposure (90% of total exposure). The most efficient way to reduce the levels in the foodchain is to reduce the *contamination in the environment*. This should be done by :

- 1) avoiding "new releases" in the environment;
- 2) addressing "historical pollution".

In order to realise this the **remaining gaps** have been identified on the basis of which an action plan has to be developed. These gaps can be classified in gaps in knowledge, gaps in legislation and gaps in implementation of Community legislation.

□ ***Gaps in knowledge*** :

***Sources and inventories*** : regarding the emission sources data gaps still exist causing considerable uncertainties of the emission estimates. The Inventory of releases to land and water is not complete : further research and data collection is needed to verify the scale of releases from the source sectors which have a high potential for release.

***Emissions in the Accession Countries*** : important dioxin and PCB sources should be identified in the Accession Countries, which may be high contributors to the total dioxin and PCB emissions into the European environment.

***Monitoring programmes*** should be developed in order to control compliance with existing legislation and to monitor the effects of this strategy, the state of the environment and the trends. These programmes will be essential in order to further identify measures.

**Measurement methods and standards** : a necessary condition for effective control and monitoring mechanisms is the availability of appropriate measurement methods and the comparability of data. At present, methods for analyses of dioxins and dioxin-like PCBs are expensive and slow. Therefore low-cost and fast methods have to be developed allowing to analyse in routinely manner a great number of samples and to provide quick, cheap, and reliable results on the presence of those compounds in the environment, feed and food. In order to obtain comparable, consistent, reliable and high quality measurement results it is necessary to implement a high quality measurement standard at Community level.

**Dioxin-like PCBs** : measurement programs performed in the past focused mostly on dioxins. Yet a variety of other compounds probably having similar adverse health effects have been identified, the so-called *dioxin-like PCBs*. The available database is insufficient to assess the current situation with respect to *dioxin-like PCBs*. Therefore the Commission recently launched a study to collect information on concentrations of dioxin-like PCBs in food, feed and in environmental samples across Europe.

**Risk Assessment** : the European Scientific Committee on Animal Nutrition (SCAN) adopted an opinion on “Dioxins in Feed” on 6/11/2000 and the Scientific Committee on Food (SCF) adopted an opinion on “Risk Assessment of dioxins and dioxin-like PCBs in Food” on 22/11/2000. The SCF updated its opinion on 30/5/2001 based on new scientific information available since the adoption of the SCF opinion of 22<sup>nd</sup> November 2000. However, for the *non dioxin-like ("classical" or "non-coplanar") PCBs* which have another toxicological profile, which circulate more easily through muscles and blood and affect directly the nervous system and brain development (namely for foetus and young children) and which could be several orders of magnitude more concentrated than dioxins in aquatic biota such as fish and shellfish a risk assessment should be carried out.

**Public information** is needed to inform the public, to allay public concern, to raise awareness about the risks associated with exposure to these compounds and about the role they have to play to prevent further contamination of the environment. It is also important to allow « self identification » of at-risk groups.

**Further research** is needed on environmental fate and transport, ecotoxicology and human health, agrofood industry, source inventories, analytical aspects, decontamination measures and monitoring. The most important gaps in knowledge concern : 1) *transfer and degradation processes* (a better understanding and quantification of the fundamental transfer processes by which dioxins and PCBs move between the different environmental media and of the degradation processes occurring within these media is needed); 2) *bio-accumulation and bio-magnification processes*; 3) *domestic incineration of wood* (there is an information deficit concerning the amount and the composition of wooden fuels used for room heating and cooking purposes); 4) *reservoir sources* (the contribution to human exposure, the behaviour and degradation processes and decontamination methods require examination); 5) *open uses of PCBs*; 6) *carry-over rates and transfer factors* for dioxins and PCBs from soil and feed to animal tissues and products (milk, eggs).

□ **Gaps in legislation** :

**Legislation in order to limit and control the presence of dioxins and PCBs in feed and food:**

In 1998, citrus pulp pellets (CPP) from Brazil with high dioxin contamination were found. Comprehensive investigations revealed that the use of highly contaminated lime (calcium hydroxide) used for the production of citrus pulp pellets was the source of the dioxin contamination of this CPP. It turned out that the highly contaminated lime used was a by-product from a chemical production process.

In 1999, in Belgium the contamination of fat used for production of feedingstuffs caused a severe contamination of different animal products. Investigations found that the discharge of a technical PCB mixture at fat collection sites used for feedingstuffs production had caused this dioxin contamination. In the same year, grass meal with high dioxin contamination was found in Germany. Here, the dioxin contamination came from the drying process: in an open system, all kinds of wood were burnt, including waste wood with chemical contamination from former paintings or use of preserved wood.

Also in 1999, kaolinitic clay, used as “anticaking agent” in feedingstuffs and as carrier for production of mineral feed was found to be highly contaminated if it originated from certain mines. Gradually it became obvious that a natural source was discovered. Possibly, geothermal processes formed this unique pattern of dioxins over time from organic material and chlorine.

In June 2000, dioxin levels were found in certain premixtures containing choline chloride, which is used as an animal feed additive. Investigations tracing back the source of contamination revealed that it was not the pure choline chloride itself but the carrier which was contaminated. Although the carrier was declared as corn cob meal, analysis demonstrated that it was not only composed of corn but also of rice husks and/or saw dust presumably treated with a wood preservative. The congener pattern found in the contaminated lots was consistent with the pattern typical of a pentachlorophenol contamination, which is used as wood preservatives. During the year 2000, the trace elements zinc oxide and copper oxide from certain origins have been found to be contaminated with dioxins at increased levels. These incidents clearly indicate the need to establish legislation in order to limit and control the presence of dioxins and PCBs in feed and food.

□ ***Gaps in implementation of the Community legislation***

***The PCB Directive has not been adequately implemented*** and several infringement cases have been launched against Member States for failure to implement the obligations under this Directive. In the case of PCBs there is currently a deadline of 2010 for destruction and disposal (pursuant to Directive 96/59/EC on the disposal of PCBs and PCTs) of big equipment. However, Member States are experiencing problems for establishing the mandatory inventories of PCB-containing equipment and to prevent the illegal dumping and inadequate disposal of PCBs.

**5. BASIS FOR COMMUNITY ACTION**

- ***The Treaty establishing the European Community*** provides in Article 152 that a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities and in Article 174 that Community policy on the environment is to contribute to preserving, protecting and improving the quality of the environment and to protecting human health.
- The ***Feira European Council*** held on 19 and 20 June 2000 reaffirmed the need to ensure a high level of protection of human health in the definition and

implementation of all Union policies. Food safety policy must apply to the entire animal and human food chain and food legislation meeting the most stringent public health criteria should be in place as soon as possible. The European Council asked the Commission to propose harmonised maximum levels for contaminants, in particular for dioxins.

- The **European Parliament** in its plenary session on 4 October 2000 discussed a proposal for a Directive of the European Parliament and of the Council on undesirable substances and products in animal nutrition. On this occasion, the European Parliament called upon the Commission to set maximum limits for dioxins and PCBs in all feedingstuffs without delay.
- The European Parliament (DG Research : Scientific and Technological Options Assessment) financed the study "Dioxins and PCBs : Environmental and Health Effects" (Bipro-Irce, July 2000) aimed at developing political and technical options for an integrated and systematic approach to secure better protection of human health and of the environment from the effects of dioxins and PCBs. The study aimed to effectively contribute to the European discussion and to support a European dioxin and PCB strategy.
- The European Parliament (Committee on the Environment, Public Health and Consumer Policy) prepared a report on the implementation of Directive 96/59/EC on the disposal of PCBs, and adopted a Resolution in January 2001. The Parliament recommended that the immediate priority should be to implement the existing legislation and called on Member States to make additional efforts to fulfill their obligations. Finally, the Parliament considered that the PCB Directive should be a test case for a better development of more effective policies on other highly toxic substances.
- **The Precautionary Principle** : precaution underlies the concern of the Commission and is embedded within this Strategy.
- In the **Fifth Environment Action Programme** entitled "**Towards sustainability**", presented by the European Commission to the Council, and approved by the Council in 1993 the need to reduce emissions of dioxins is specifically mentioned in relation to air pollution and the treatment of waste. In particular, a target is set for a 90% reduction of dioxin emissions to air from identified sources by the year 2005 compared to 1985 levels.
- In the **Sixth Environment Action Programme** entitled "**Environment 2010: Our Future, Our Choice**" the overall Environment-Health objective is to achieve a quality of the environment where the levels of man-made contaminants do not give rise to significant impacts on or risks to human health.
- In the **White Paper on Food Safety**, the Commission identified the obvious need to define standards for contaminants throughout the chain from feed to food. In the Action Plan on Food safety annexed to the White paper on Food Safety, the setting of maximum levels for several contaminants including dioxins and PCBs for foodstuffs was one of the measures to be implemented with a view to achieving the highest possible level of health protection. Unavoidably, complementary to the measures to be proposed at the level of food and feed, the need for source directed measures reducing the contamination of the environment has been identified.

## 6. STRATEGY

To secure better protection of human health and of the environment from the effects of dioxins and PCBs an integrated and systematic approach is needed. Therefore the Commission proposes a strategy :

- 1) to reduce the presence of dioxins and PCBs in the environment;
- 2) to reduce the presence of dioxins and PCBs in feed and food.

This strategy aims to fill the identified gaps, to improve the link between data collection and a consistent Community response system, to adjust the existing sectoral legislation in order to achieve the Environment-Health objectives of the 6<sup>th</sup> EAP and to develop incentive measures promoting exchange of information and experience between Member States.

Full enforcement of existing Community legislation by the Member States is a prerequisite to achieve the objectives pursued by this strategy. Furthermore the success of the strategy will critically depend on the action taken at local and regional level by communities and Member States.

### 6.1. Strategy to reduce the presence of dioxins and PCBs in the environment

All assessments have stressed the urgent need to reduce the sources of environmental contamination with these compounds to the lowest possible as the most appropriate way to reduce human exposure. Therefore, a set of actions has to be identified for the short- to medium-term and for the long-term.

#### **SHORT- to MEDIUM-TERM ACTIONS (5 years)**

This set of actions relates to Hazard Identification, Risk Assessment, Risk Management, Research, Communication to the public and Cooperation with third countries and international organisations.

##### **A) Hazard Identification**

##### ***Further identification of Dioxin and PCB sources***

A complete inventory of sources and more knowledge on the share of the different *dioxin sources* is essential. "The European Dioxin Emission Inventory, Stage II", (LUA-NRW,2001), launched by the Commission, identified the need for further investigation or actions on specific sources. The Commission will therefore take the following actions :

Hospital waste incinerators : a comprehensive inventory on these facilities, including their main operation data will be generated in the short-term and those countries still relying on the on-site incineration of hospital waste will be encouraged to change to other, less emissive waste management systems and treatment methodologies as soon as possible. This will be supported through the new Directive 2000/76/EC on the incineration of waste as new hospital waste incinerators will have to comply with the obligations of the Directive in December 2002 and all the existing incinerators by December 2005.

Iron ore sintering might become the most relevant industrial sector. The importance of this source will be further enhanced by the facilities located in accession countries. Emission measurements at the plants still not tested will be carried out. Since dioxin emissions from sintering plants may be reduced considerably by primary measures the Commission will help to spread this knowledge to the respective contacts in the iron and steel industry. The BREF<sup>6</sup> on the production of iron and steel - established under the IPPC<sup>7</sup> Directive (96/61/EC) - describes such primary measures and is already available on the internet (<http://eippcb.jrc.es>). The Commission will further promote the use and implementation of BAT in this sector.

Electric arc furnaces might be the only industrial source with constant or increasing emissions to air. However, through application of suitable abatement technologies which have already been developed this trend could be stopped in the future. The same BREF as mentioned in the paragraph above provides also information about dioxins from electric arc furnaces. The Commission will further promote the use of BAT in this sector in the framework of the exchange of information co-ordinated by the European IPPC Bureau.

Non - ferrous metal industry : the facilities for zinc recovery from electric arc furnace (EAF) filter dusts have proven to be major dioxin emission sources. All facilities for zinc recovery from EAF dusts and similar materials and dioxin emissions from these installations will be determined. The BREF of the non-ferrous metal sector mentions the techniques for reduction of dioxin emissions in this sector, which the Commission will further promote.

Miscellaneous industrial sources : there is a vast number of miscellaneous industrial installations with small dioxin releases per each facility but together contributing considerably to the annual dioxin emissions in Europe, such as secondary smelters for non-ferrous metals (aluminium, copper), iron foundries (cupola furnaces), cement production. The Commission will encourage the licensing authorities to evaluate possible dioxin emissions from these "low emissive" installations in a case-by-case consideration taking into account the information available on BAT for those sectors.

For the categories of installations with the highest dioxin emission potential the IPPC Directive envisages the adoption of emission limit values for dioxins when the need for Community action has been identified on the basis, in particular, of the exchange of information provided for in Article 16.

Non-industrial emission sources : concerning the *domestic solid fuel combustion* the Commission intends to set up an emission inventory for all EU and Accession countries and to carry out further research and an accurate quantification on domestic wood and coal combustion. In the framework of the Risk Communication Strategy (see 6.1.E) better information will be provided to the public on the environmental effects and the abuse of inappropriate materials as fuels for heating purposes and on the risks of *domestic waste burning* ("backyard burning"). More research on the *natural sources* of dioxins (clay, mines, etc..) and their share in the overall release into the environment will be promoted. Recently concern was raised on the emission of dioxins, among a range of other substances, from the *burning of animal carcasses*

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<sup>6</sup> Best Available Techniques Reference document  
<sup>7</sup> Integrated Pollution Prevention and Control



on pyres as a result of the foot and mouth disease. The Commission will consider whether this choice of disease control strategy is sustainable in view of the practical difficulties it presents in containing its environmental impact in a timeframe that is consistent with rapid and effective disease control. The aim will be to ensure that unacceptable emission of hazardous substances into the environment and consequently in feed and food chain do not occur.

The Inventory of releases to *land and water* is still incomplete. Further research and data collection will be carried out to verify the scale of releases from the source sectors which have a high potential for release. Not just measurements on concentrations, but also further research on details of activity and processes will be included.

For the *PCB sources* the Commission will accelerate the establishment of PCB inventories as Directive 96/59/EC requires and will gain more knowledge on the different open uses of PCBs. In that view, the Commission intends to launch a study on the open uses of PCBs. The PCB problem has been seen as an historic one but recent studies indicate that there may be significant contemporary emissions from a number of industrial processes. Therefore, more recent data are required to assess whether PCBs are formed in the processes or whether the findings are due to re-emission of existing PCBs.

## **B) Risk Assessment**

### ***Non dioxin-like PCBs***

The Commission will address to the SCF<sup>8</sup> a request for evaluation of the "*non dioxin-like PCB's ("classical" or "non-coplanar" PCBs)*" which have another toxicological profile, which circulate more easily through muscles and blood and affect directly the nervous system and brain development and which could be several orders of magnitude more concentrated than dioxins in aquatic biota such as fish and shellfish.

### ***Development of measurement methods***

It is necessary to perform more measurements in order to 1) *control compliance* with existing legislation and also, in order to 2) *monitor* the effects of executed measures, the state of the environment and the trends. Therefore, scientific research and technological development on low-cost and easily applied routine tests for the measurement of dioxin and dioxin-like PCB contamination in environmental samples in feed and food as well as research in the field of continuous measurements of dioxin emissions to air will be promoted. Moreover, guidelines and standards for sampling, data generation and reporting will be developed.

During the EC/WHO seminar (Brussels, September 2000) the WHO and the EC decided to jointly organise a workshop to evaluate rapid screening methods and to identify the research needs in this area.

### ***Establishment of environmental indicators, including bio-indicators***

In order to monitor the impact of regulatory controls on the environment and on human exposure to dioxins and PCBs indicators will be developed. The selection of environmental indicators for monitoring purposes will be a short- to medium term

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<sup>8</sup> Scientific Committee on Food