

EuroPCB: inventory PCB enforcement in member states

Part I

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Summary

In 2004 at the 5th CLEEN meeting the Netherlands have committed to deliver a thorough inventory about the state of implementation measures in the member states on decontamination and disposal or labelling of PCB containing equipment by September 2005.

According to the Council Directive 96/56/EC on the disposal of PCBs member states should implement legislation on the controlled disposal of PCBs in order to eliminate them completely. This EuroPCB project is meant to identify the national schemes for decontamination and disposal of PCBs and to determine the level of compliance of companies regarding Council Directive 96/59/EC.

The EU has established instruments with regard to PCBs and PCTs. The use of PCBs as a raw material or chemical intermediate has been banned in the EU since 1985 (85/467/EEC, 6th amendment to Directive 76/769/EEC). Council Directive 96/59/EC contains measurements for phasing out existing PCB containing equipment / material. Due to other agreements a number of member states has with regard to the national PCB legislation more stringent requirements than what EU legislation is stipulating (e.g. lower volume levels, more stringent time tables).

This investigation only has been focused on electrical equipment. The greater part of remaining PCBs should be present in this sector. A recent (draft) EU-report (3) gives a description of all Persistent Organic Pollutants and regarding PCBs; it indicates that very large waste streams (demolition waste, waste oil, shredder waste, sewage sludge and compost) might be contaminated with PCBs. The concentration of PCBs is in most cases much lower (< 50 ppm PCB).

Some main conclusions of this investigation are:

In general the legislation on ban and phasing out of PCBs has been implemented in almost all member states. Considering the number of [infringement proceedings concerning the directive 96/59/EC](#) we also must conclude that some member states still have to improve their legislation or fulfil some obligations. The availability of figures on disposed and remaining PCB (equipment) differs a lot. The differences between the figures of member states with comparable background are in many cases inexplicable. We estimate the remaining quantity of PCB containing oil on 350.000 ton, which contains about 50.000 tonnes pure PCB. The total gross weight of the equipment we estimate on 1,1 million tonnes. We must realize that a number of inventories might not be completed and we lack information (Malta, Walloon region) so this total amount is a minimum. On the other hand information on recent disposal has not been taken into account. If we compare this amount with the amount which has been disposed until now (at least 0,5 million tonnes gross weight) the EU as a whole is not half way (30 percent). On the other hand about 10 member states have indicated they (almost) have solved the PCB problem. The experiences in those member states did not lead to a best practical approach for phasing out. The experiences in Belgium and the Netherlands with a subsidy grant pointed out that such regulation is not decisive for companies for replacing their equipment.

The capacity for incineration in Europe for the disposal of PCB containing equipment seems sufficiently, surely if we consider the equipment with < 500 ppm PCB in countries with a large quantity (Spain and France) may be disposed at their end of life. The capacity for dismantling equipment seems limited for treating all equipment within a short period (5-10 years). The possibilities for dismantling and incineration in the EU are not present in each member state. In many cases shipments between member states must take place.

With the available information it is difficult to express the reliability of the figures. A detailed list of all types of transformers (including year of construction) and their characteristics could help determining the completeness and correctness of the data. For this all member states should report all types of transformers. As a start a pilot project could be started in which a few countries gather the information and compare the results. Article 10 of the Council Directive 96/59/EC states the Commission will set up a list of capacitors, resistors and inductance coils, containing PCBs. Such (pilot) project could support making this list.

To keep track on the process of phasing out it is important to monitor the amount and destination of the PCB waste. The exchange of information on shipments between member states could improve the quality of the figures. Due to the poor data on historic disposal of PCB waste, the importance of national waste statistics is obvious. Article 4 of the Council Directive 96/59/EC already obliges member states to set up a system in which changes in occurrence and the disposal are registered.

1. Introduction

In 2004 at the 5th CLEEN meeting the Netherlands have committed to deliver a thorough inventory about the state of implementation measures in the member states on decontamination and disposal or labelling of PCB containing equipment by September 2005.

According to the Council Directive 96/56/EC on the disposal of PCBs member states should implement legislation on the controlled disposal of PCBs in order to eliminate them completely. This EuroPCB project is meant to identify the national schemes for decontamination and disposal of PCBs and to determine the level of compliance of companies regarding Council Directive 96/59/EC.

The Netherlands has offered to take the project management, supported by an external consultant, Meurs Environment.

This EuroPCB project has the objectives to describe the measurements in each member state, represented in a matrix, and to describe the extent of PCB disposal in all member states. Because of the participation in CLEEN in this report the data of Luxembourg are only based on own investigation, the data of Norway on the other hand have been examined. This report describes the state of affair on PCB disposal in the EU, the differences between member states (benchmark) and conclusions and recommendations regarding best practicable measurements and PCB enforcement.

The project started in December 2004 and during the first phases information has been gathered on the PCB issue in the different member states. This final report reflects the results and gives an overview of the legislation, execution and results in all member states. More detailed information of each member state has been laid in fiches. Those fiches are gathered in part II.

Next to this investigation the European Commission has started a study to facilitate the implementation of certain waste related provisions on the Regulation on Persistent Organic Pollutants (POPs). This study includes all POPs and describes all possible sources and flows of PCBs. The draft of this report (1) has been published at 27 May 2004. The analogue regarding the remaining amount of PCBs can be retrieved in paragraph 4.3 (table 5) of this report and paragraph 4.2 (table 4-38 and 4-39) of the EC report (1). A copy of this relevant section of the EC-report has been placed in Annex 1.

2. Background

PCBs were discovered over 100 years ago and their production and commercial use began in 1929. Between 1929 and 1989, total world production of PCBs (excluding the Soviet Union) was 1.5 million tonnes - an average of about 26.000 tonnes per year. Even after the US banned the manufacture, sale, and distribution of PCBs except in "totally enclosed" systems in 1976, world production continued at 16.000 tonnes per year from 1980-1984 and 10.000 tonnes per year from 1984-1989 (2). European countries in which PCBs have been produced are the United Kingdom, Germany, Italy, France, Spain and Slovakia.

The uses of PCBs can be classified as either closed or open. In closed applications it was the intention to prevent any loss of PCB by containment within a sealed unit. Contamination of the environment is then consequent upon equipment leaks, for example as a result of a fire. Because of their remarkable insulating capacity and flame retardant qualities, PCBs were used on a large scale as coolants and lubricants in transformers and other electrical equipment where these properties are essential. PCBs replaced combustible insulating fluids, thus reducing the risk of fires in office buildings, hospitals, factories, and schools. Among the equipment still in use today, PCBs are mostly found in electrical transformers and capacitors that were manufactured before 1980. It may be assumed that any capacitor or transformer manufactured before about 1976 may contain PCBs unless there is information that proves the contrary. It is also possible that PCBs may be present in transformers and capacitors manufactured between 1976 and 1986. Even when other fluids have replaced PCBs, significant amounts of PCBs may still be present. PCBs may occur as contaminants in the oil used in oil-filled electrical equipment.

In open applications the PCBs are exposed to the environment, and some loss to the environment is inevitable. PCBs have been used in a wide range of products including: lubricants, cutting oils, sealing compounds (for the construction industry), adhesives, plastics and rubbers, insecticides, and in paint, varnishes, and other surface coatings, including carbonless copying paper.

The EU has established instruments with regard to PCBs and PCTs. The use of PCBs as a raw material or chemical intermediate has been banned in the EU since 1985 (85/467/EEC, 6th amendment to Directive 76/769/EEC). Council Directive 96/59/EC contains measurements for phasing out existing PCB containing equipment / material. Due to other agreements a number of member states has with regard to the national PCB legislation more stringent requirements than what EU legislation is stipulating (e.g. lower volume levels, more stringent timetables).

Council Directive 76/769/EEC of 27 July 1976 contains restrictions on the marketing and use of certain dangerous substances and preparations (e.g. TBT, PCBs). This Directive has also been amended several times, e.g. by Council Directive 85/467/EEC of 1 October 1985 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 (PCBs/PCTs). The objective is to restrict the marketing and use of PCBs and PCTs. Thus, the use of PCBs and PCTs is prohibited in closed system electrical equipment transformers, resistors and inductors, in large capacitors (> 1 kg total weight), in certain small capacitors, in heat transmitting fluids in closed circuit heat transfer installations, in hydraulic fluids for underground mining equipment, from July 1986 on. Council Directive 89/677/EEC of 21 December 1989 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 amended this Directive for the 8th time. The Directive prohibits the use and reuse of PCBs and PCTs and any mixture containing them in more than 0.005 % by weight (= 50 ppm).

Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs), is replacing Council Directive 76/403/EEC (ban of use of PCBs in EC in open applications, 1976). The purpose of this Directive is to approximate 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 on the basis of the provisions of this Directive. According to this Directive member states must submit an inventory and detailed plans for the disposal of the relevant PCB wastes and the decontamination/disposal of relevant equipment containing more than 5 litres (> 5 dm³) of PCB until September 1999. The year 2010 has been set as a deadline for complete disposal or decontamination of equipment containing PCBs. Any equipment, which is subject to inventory, must be labelled. Transformers containing between 500 and 50 ppm of PCB are allowed to remain in service till end of life time. Furthermore the member states must

prohibit the separation of PCBs from other substances for the purpose of reusing the PCBs and the refilling of transformers with PCBs. Member states have also to establish plans for the collection and disposal of equipment not subject to the inventory.

Other agreements which have similar objectives are the HELCOM recommendation (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, Sweden), the PARCOM Decision 92/3 (Belgium, Denmark, Finland, France, Germany, the Netherlands, Norway, Spain, Sweden and UK) on the phasing out of PCBs and hazardous PCB substitutes (OSPAR Convention, assessment of Contracting Parties' Implementation Report on PARCOM Decision 92/3 on the Phasing Out of PCBs and Hazardous PCB Substitutes, 2002,) and the Stockholm Convention. In this report we frequently used the information laid down in intermediate reports of those agreements (3, 4).

The HELSINKI CONVENTION (HELCOM) aims to protect the Baltic Sea Area. PCBs shall be banned for all uses, except in existing closed system equipment until the end of service life or for research, development and analytical purposes in the Baltic Sea Area and its catchment area. It contains a recommendation regarding to the elimination of the use of PCBs and PCTs (adopted 13 March 1985, having regard to Article 13, Paragraph b) of the Helsinki Convention). The Contracting Parties should stop the production of PCBs and PCTs and the marketing of articles and equipment containing PCBs/PCTs from 1987 on. National programmes should be established to identify and/or label, collect, dispose and destruct PCB-containing articles. Equipment containing PCBs/PCTs should be disposed of or destructed in an environmentally safe manner: hydraulic fluids in underground mining equipment, closed system electrical equipment (transformers, resistors, inductor, capacitors > 1 kg total weight) as soon as possible, small capacitors at the latest when they reach the end of their service life.

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention") was opened for signature at the Ministerial Meeting of the former Oslo and Paris Commissions in Paris on 22 September 1992. The Convention entered into force on 25 March 1998. It has been ratified by Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, the Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom and approved by the European Community and Spain. The main existing OSPAR measure on PCBs is Decision 92/3 on their phasing out, which requires the destruction of all identifiable PCBs. EC Directives ban their use in open applications, as raw material and intermediates, and require PCBs to be inventoried and destroyed.

In May 2004 the Stockholm Convention on Persistent Organic Pollutants entered into force. POPs are chemicals that are highly toxic, persistent, bioaccumulate and move long distance in the environment. The convention seeks the elimination or restriction of production and use of all intentionally produced POPs. Stockpiles must be managed and disposed of in a safe, efficient and environmentally sound manner. The convention imposes certain trade restrictions. The Stockholm Convention developed by the United Nations Environment Programme (UNEP) is one of the three conventions, which provide an international framework governing the environmentally sound management of hazardous chemicals throughout their lifecycles.

3. Method of investigation

The method we used in this study consisted in:

- a. Examine the information which has been sent by the member states to the European Commission by the member states.

According to Council Directive 96/59/EC and other regulation member states have to report to the European Commission information on the way they have implemented EU regulation and also report about the results. Two important reports are: the results of an inventory of PCB containing equipment and a plan which describes the scheme of decontamination and disposal of PCB containing equipment. Some features of the investigation we performed at the EU office in Brussels were:

- The extensiveness of the information of the different member states differs (e.g. some countries have sent all detailed information of each region without a total view).
 - The way of reporting differs. Although the article in question gives some guidance a clear format is missing.
 - The national legislation was not available in the same file.
 - In most cases the reports were written in the native language.
- b. Send a questionnaire to the responsible person (PCB focal point) in each member state. At the start of the project a questionnaire has been formulated (see annex 2) and have been sent to the members of CLEEN. The following countries (18) have responded: Austria, Belgium (Flanders, Brussels), Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Italy, Latvia, Lithuania, Netherlands, Norway, Portugal, Slovakia and Sweden. No response was given by Belgium (Wallonia), Germany, Ireland, Malta, Slovenia, Spain and the United Kingdom.
 - c. Search on the Internet for relevant information / other literature.

Based on the information gathered we have formulated a fiche for each member state. In each fiche we have described the following:

A. Legislation.

- Measures to forbid production and trading of PCB's (including restricting the reuse of PCB).
- Measures for disposing and decontamination of PCB's and equipment containing PCB's before 2010.
- Limits correspondence with Directive.
- Subsidiary regulation.

B Executive:

- Inventory on PCB containing equipment.
- Plan and other executive measures.
- Measures for small PCB containing equipment (smaller than 5 dm³ volume PCB).
- Removal Companies/disposing facilities.
- Responsible authorities.

C. Results.

- Quantity PCB removed and left.
- Quantities PCB disposed by treatment facilities.

Those fiches are the base of the information we have put together in this report. The fiches have been compiled in a separate document (part II). The draft fiches and a first draft report (June 2005) have been sent to the CLEEN participants / PCB focal point of each member state. Annex 3 shows which member states have returned the questionnaire and gives their comment on the first draft report. The comments have been elaborated and a final draft has been presented and discussed at the CLEEN conference of September 2005. The final draft has been approved. In comparison with the draft a few supplements / adaptations of Italy and Czech Republic have been elaborated into this final report.

4. State of affairs in EU member states

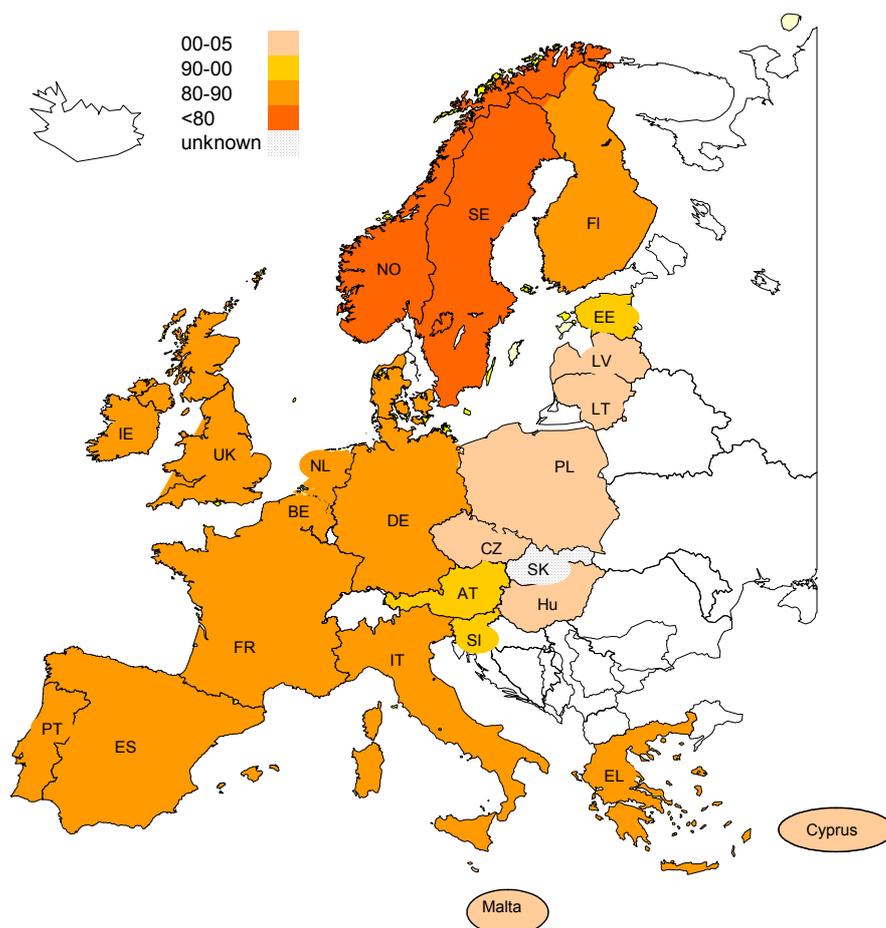
This chapter contains an overview of the implementation of Council Directive 96/59/EC in all member states. If we speak about member states we also include Norway. Hereby we have made a distinction between the legislative situation, execution measurements and the results.

4.1 Legislative situation in EU member states.

As mentioned before a number of directives on PCBs has been issued. Out of these directives the important factors have been selected. In the next figures we give an overview when or how the different member states have implemented those factors.

Figure 1 shows in which period the member states implemented the ban on the production and trade in PCBs. Most countries first forbid the use of PCB in open applications. The investigators still miss the information on the situation in Slovakia, but we may conclude that in the other member states the ban on the production, trade and new application has been fully effectuated. Most member states forbid the production and trade in around the mid eighties, as required by the directives 76/769/EEC and 85/467/EEC.

Figure 1. Period of implementation by member states of ban production and trade PCBs.



Another important issue is the way member states fulfil the obligation for the phasing out of existing PCB containing equipment or material. A number of member states has legislation which already forbids the use of all PCB contaminated equipment regardless of the concentration of PCBs (including 50 to 500 ppm). Table 1 contains an overview at which way member states have or shall phase out PCB containing equipment. The following countries should already be free of PCB containing equipment: Denmark, Finland, Germany, the Netherlands, Norway and Sweden. In Belgium and Italy the phasing out process should be ended in 2005. Belgium, Germany and Norway have the opportunity to grant some exceptions

until 2010. A number of countries makes use of the possibility to let transformers with less than 500 ppm PCB in use until end of life time: Austria, Belgium, Cyprus, Czech Republic, France, Italy, Portugal, Spain, Slovenia and the United Kingdom. In the remaining member states the phasing out should be finished in 2010 as stated in article 3 of the Directive 96/59/EC.

Table 1. Timetable phasing out PCB containing equipment in member states.

Country	Final date PCB-ban (use)/legislation disposal PCB	Exception transformers with < 500 ppm PCB
Austria	1999 (only > 500 ppm)	< 500 ppm end of lifetime
Belgium	In general 2005 Brussels: more than 1 dm ³ Some exceptions: 2007 (Brussels) 2010 (Flanders)	< 500 ppm end of lifetime (Flanders) No exception (Brussels)
Cyprus	2010	< 500 ppm end of lifetime
Czech Republic	2010	< 500 ppm end of lifetime
Denmark	2000	No exception
Estonia	2010	No exception
Finland	1994 (PCB containing transformers and capacitors > 1 kVA) 2000 (> 5 dm ³ prohibited)	No exception
France	Depending on the age of equipment: 2004/2006/ 2008, all equipment before 2010.	< 500 ppm end of lifetime
Germany	1993: more than 1 dm ³ 1999: less than 1 dm ³ 2010: some exceptions	No exception
Greece	2010	No exception
Hungary	2010	No exception
Ireland	2010	No exception
Italy	2005	< 500 ppm end of lifetime
Latvia	2010	No exception
Lithuania	2010	No exception
Malta	2010	No exception
Netherlands	2003	No exception
Norway	1995: more than 1 kg 2005: less than 1 kg 2010: some exceptions	No exception
Poland	2010	No exception
Portugal	2010	< 500 ppm end of lifetime
Slovakia	2010	
Slovenia	2010	< 500 ppm end of lifetime
Spain	2010	< 500 ppm end of lifetime
Sweden	1995	No exception
United Kingdom	2000	< 500 ppm end of lifetime

Almost all member states use the EU limit of 50 ppm for determining whether material is PCB contaminated. Only Austria (30 ppm), the Netherlands (0,5 ppm per 7 congeners) and Sweden (in oil 2 ppm) make use of a different value. Norway formally has a zero limit, but in practice the 50 ppm limit is acceptable.

A way to stimulate the disposal of PCBs is to set up a financial regulation; companies may submit a request for financial support (subsidy grant). Both Belgium and the Netherlands had such a regulation.

The Netherlands had such a regulation from 1984 – 1988. Although during this period an important part of the high contaminated PCB equipment has been replaced, an evaluation pointed out that this regulation was not decisive for companies. The general attention at that time to the PCB issue had probably more effect to the removal of PCB containing equipment. Belgium had a similar regulation which recently stopped. The contribution was smaller and only a few companies made use of this regulation.

4.2 Executive measurements in EU member states.

According to directive 96/59 member states must execute a number of activities. The ones we will describe are:

- Execute an inventory on existing PCB containing equipment / material.
- Set up a plan how to realize the removal of PCBs
- How to deal with small PCB containing equipment

Table 2 gives an overview how member states have full filled the points mentioned above.

Table 2. Executive measurements PCB removal in member states.

Country	Inventory executed	Plan	Measures small equipment
Austria	1996	Yes	Equipment > 1 dm ³ or equipment < 1 dm ³ and together with other equipment > 2 dm ³ the same as 'normal equipment'
Belgium	Flanders:1986, continuous Brussel:1999, continuous Wallonia: ?	Yes	Small PCB containing equipment (less than 1 litre PCB) must be removed at the end of their life span.
Cyprus	2001-2003, will kept up to date	Yes	Art 9(1) (b) Regulatory Act the Minister prepares a national plan
Czech Republic	2002-2004, will be kept up to date	Preparation finalized in March 2004	Concrete measurements are not known. It is optional for companies to include the "small" equipments to the inventory. These equipments are step-by-step incinerated in the hazardous waste incineration plant in the Czech Republic.
Denmark	1999	No. Danish authority has stated there is no PCB equipment left according to the last inventory so a plan is not opportune.	Same as other equipment or Statutory Order on electronic waste
Estonia	2001, will kept up to date	No	PCB-containing small equipment must take to a hazardous waste collection site.
Finland	1999	Yes	Program to intensify the collection and treatment of waste from devices containing PCB also includes measures for small PCB containing equipment (<5 dm ³ volume PCBs). Small equipment is subject to separate collection and disposal at the end of its useful life through separate collection of waste from electronic equipment and through hazardous waste collection.
France	2002, continuous	Yes, in 2003	Small transformers will be disposed at the end of their use
Germany	1998		Equipment with PCB as dielectric material (small capacitors) with less than 100 ml use is allowed until end of lifetime. With a content of 100 ml till 1 litre the use must be ended at the end of 2010.
Greece	2001	Law with guidelines for a plan holders must formulate and notify	Small equipment is subject to separate collection and disposal at the end of its useful life
Hungary	2001-2004	Will be set up in 2005	

Country	Inventory executed	Plan	Measures small equipment
Ireland	2001	National Hazardous Waste Management Plan (1998) / Management Plan for PCBs (2002)	Equipment containing smaller than 5 dm ³ must be removed, be taken out of use, recycled or disposed of at the end of its useful life.
Italy	All 28 regions have reported to EC	A number of regions reported a disposal plan	The regional plans should contain measurements concerning small PCB containing equipment. The general obligation for decontamination and disposal has been provided for in article 5 of legislation Decree No. 209/99.
Latvia	2004, still to be completed	Will be approved in April 2005	No plans yet
Lithuania	at first a questionnaire (2003), afterwards continuous according legislation	2003	Under development
Luxembourg	?	?	?
Malta	?	?	?
Netherlands	1998: legal duty to inform Inspectorate 2002: electricity companies 2004: others	National Waste Management Plan 2003	Objects which contain capacitors with a total weight less than 1 kg and produced before the 1st of August 1985 may still be used. At the end of lifetime they must be disposed according to the waste legislation
Norway	1992, 1997	yes	Collect and subsidize collecting for PCB items concerning glass/frame and glue waste
Poland	2002	Operational programme for the disposal of PCBs and Pacts for the 2003-2006 period	
Portugal	From 1994 continuously, complied with CD in 1999, a extra inventory in 2004	National Plan of Decontamination and/or Elimination of the PCBs containing equipments (inventoried)	Beside this national Plan a Collect Project (and future elimination) of equipments not submitted to the inventory but which contain PCB less than 5 dm ³ .
Slovakia	2001, 2003, will be continuously	Under development	
Slovenia	2001, continuously A new inventory on the basis of Operational Programme in 2004	Operational programme for the disposal of PCBs and PCTs for the 2003-2006 period	The study: " <i>The concept of dealing with small PCB containing equipment</i> " was already done. The regulation and programme regarding collection and removal of small containing equipment is in preparation
Spain	2002	Nacional de Decontaminacion y Eliminacion de PCB, PCT y aparatos que los contengan 2010 of the 18th of April 2001	
Sweden	1984	Not applicable	Legislation for disassembly before further treatment
United Kingdom	2001	UK Action Plan for phasing out and destruction of PCB (1997)	UK Guidance: Collection and Disposal, of Equipment Containing Small Amounts of PCBs. This covers small electrical and electronic appliances.

Most member states have executed at least one inventory and some have a regulation which obliges holders of PCB containing equipment / material to notify the presence and removal of equipment. If this system is carried out correctly, a continuously up to date file is available.

A general observation we can make is that extent and the target group of the inventories diverge, although most member states first focus on electricity companies. Also most inventories are carried out by sending a questionnaire to the companies involved. We could not obtain information on the effectiveness of this approach: how complete and reliable is the information and what is the situation at non responding companies.

Most member states have a plan about the way how to deal with the intended removal and have subscribed way of disposal of PCBs. Member states which are already supposed to be free of PCBs have no special plan to reach the goal of phasing out: at the most regulations for PCB disposal.

According to article 11 of the directive 96/59 the plan should be focused on the cleaning and disposal of PCB containing equipment (both inventoried equipment and not inventoried small equipment). We could not find any information in the plans available in which special attention has been paid to the way enforcement of the regulations on PCBs has been elaborated. The way most member states handle the removal of little (possible) PCB containing equipment is setting up a disposal system for such equipment as a waste (end of life time principle). The relation with the directive on Waste Electrical and Electronic Equipment (WEEE) is obvious: according to this directive member states should take measurements for the collection and disposal / recycling of small electrical / electronic equipment. A part of the equipment might contain small PCB containing parts like capacitors.

The duty to dispose PCB containing equipment / material means that there must be sufficient capacity for the pre treatment and disposal of such waste. In Europe a number of companies have a licence to treat and dispose PCB containing waste. Table 3 contains the (number of) companies involved. The pre treatment facilities drain the PCB liquid and then rinse the remaining equipment. The PCBs are incinerated and the metal is suitable for recycling.

Table 3. Treatment facilities of PCB waste in member states.

Country	Pre treatment		Incineration		Permanent storage	Source
	Number	Capacity (ton /year)	Number	Capacity (ton /year)		
Belgium	1	7.500	2	5.000		4
Czech republic			1	1.000		4
Denmark			1	2.500		1
Finland ¹			1	30.000		1
France	9	33.000	2	15.000		2
Germany	1	5.000	16	52.000	3	3
Hungary			1			4
Latvia			1			4
Netherlands	1	8.000	1	660		1
Poland	1		2	4.500		4
Sweden			1	2.000		1
United Kingdom			3	9.500		1
Total	13	53.500	32	122.160	3	

1: The capacity depends on what kind of waste (liquid, solid etc.).

Source:

1= United Nations Inventory of World-wide PCB Destruction Capacity First Issue December 1998 (2).

2= France: PLAN NATIONAL DE DECONTAMINATION ET D'ELIMINATION DES APPAREILS CONTENANT DES PCB ET PCT (6)

3=Correspondence to EU (Mr. Pohlmann) (5)

4=Questionnaire EuroPCB

5=other

The total capacity in the EU member states is about 50.000 ton PCB equipment pre treatment and 120.000 ton PCB waste for incineration. The figures for incineration are based on average PCB content in waste (liquid). Usually the capacity for incineration of PCB is determined by the chlorine content. The figure for pre treatment is based on the gross weight of PCB waste.

4.3 Result measurements PCB removal in EU member states.

PCBs have been applied in two kinds of situations: a closed system like PCB oil in transformers and capacitors and in open systems like paint, copy paper and building products like sealant (under trade name Thiokol) and grouting. It can be assumed that most open applications already have been disposed due to the earlier ban and the shorter period of use. In this investigation we will focus on PCB in closed

applications although we will mention the open application if indicated explicitly by respondents or other sources.

In general we may distinguish five categories of PCB materials:

1. In-Use PCB liquid like Askarel: i.e. various types of equipment (transformers, capacitors, fluorescent lamp ballasts, and other equipment) that is in-use and contains high concentration PCB liquids - usually pure PCBs or Askarel (PCBs diluted to about 40 - 70% with chlorobenzenes).
2. In-Use Mineral Oil: i.e. PCB-contaminated mineral oil in transformers and other equipment that is in use, most often having a PCB concentration less than 500 ppm in the oil, and almost always less than 1000 ppm.
3. PCB Waste: i.e. Askarel and high concentration PCB liquids in equipment (transformers, capacitors, and other equipment) that is no longer being used, and high concentration PCB liquids in other containers.
4. Mineral Oil Waste: i.e. waste PCB contaminated mineral oil in transformers and other equipment that is no longer being used, and waste PCB contaminated mineral oil in other containers.
5. Other PCB Wastes: i.e. transformers, capacitors, and other types of equipment that formerly contained high concentration PCB liquids or PCB contaminated mineral oil, and have been drained of these fluids; and are still contaminated. Also fluorescent lamp ballasts; PCB-contaminated soil; and other PCB-contaminated solids (e.g. wood, clothing, absorbents) and liquids (e.g. solvents).

The presented figures on inventoried PCB equipment of the member states show a large variation in magnitude. One of the reasons is the different way the quantity has been determined. In many cases an inventory only counts the number of equipment. Data on the weight or exact PCB content are in many cases not known. The weight can be reported by net weight, this can be the quantity of PCB or the quantity of PCB fluid like Askarel in the equipment, or by gross weight (i.e. the quantity of the PCB fluid in equipment plus the weight of the equipment casings). The gross weight is important to know because small equipment, such as capacitors, is usually destroyed in its entirety. Similarly, after the PCB fluid is drained, the casings and internals of transformers may still represent a PCB waste and, as such, form part of this PCB waste inventory. In a number of publications we found the figures have been presented without describing the way of determination. We must also realize that on one hand the inventories might not be completed or we lack information (Malta, Flemish region) and on the other hand information on recent disposal has not been taken into account.

For this reason the figures must be seen as an estimate. In case of large numbers we have used the following conversion: 30 kg per capacitor (of which 10 kg PCB containing liquid) and 1500 kg per transformer (of which 500 kg PCB containing liquid) and 500 kg per equipment if not specified (of which 150 kg PCB liquid). The method member states have used to determine the PCB content of capacitors is not known. In general you only can determine the composition after dismantling. An alternative is to use a list like the list (1997) of the Australian and New Zealand Environment and Conservation Council (ANZECC) with information on capacitors which contain polychlorinated biphenyls (PCBs).

A number of member states has already started an active program of removal of PCB waste and the autonomous disposal of PCB containing waste will occur in every country. Table 4 shows the amount of PCB (waste) originated in each member state that already has been disposed. We emphasize that in many cases the available data is limited. In many member states complete statistics on the disposal of PCB waste are lacking.

According to these figures at least 0,5 million ton PCB waste has been disposed. Most of the material came from Germany and France.

Table 4. Quantity (gross weight) removed of PCB contaminated material in member states.

Country	Quantity removed (tonnes)	Source	Remarks
Austria	3.735	1	1993-2002
Belgium	29.000	1	Flanders: 26.000 ton Brussels: 3.000 ton Wallonia: ? Period 1986-2004
Cyprus	unknown	1	PCB containing equipment of Electricity Authority of Cyprus removed
Czech Republic	820	1	1998-2002 (export)
Denmark			

Country	Quantity removed (tonnes)	Source	Remarks
Estonia	95	1	35 ton PCB-oil. Period not specified.
Finland			
France	154.596	1	1996-2003: Incineration: 42.409 ton Decontamination: 112.817 ton
Germany	310.000	2	In period until 1998: 274.000 tonnes
Greece	794	1	1991-1998
Hungary	24	2	In 2002
Ireland	261	2	1996: 71 ton, 1998 190 ton exported
Italy			
Latvia			
Lithuania			
Malta			
Netherlands	15.000	2	In period 1988-2003
Norway	614	2	400 ton transformers / large capacitors and 214 ton small capacitors in period 1980-2004
Poland			
Portugal	275	1	Until period 2002
Slovakia			
Slovenia	848	2	1991-2003
Spain			
Sweden	2.000	1	PCB fluid from 200 transformers and 100.000 capacitors
United Kingdom	25.000	2	Until 1986 4.000 ton PCB (25.000 ton waste)
TOTAL	0,5 million		

Source: 1=Questionnaire EuroPCB, 2=Other (see fiche)

Table 5 contains information on the remaining quantity of PCB expressed as the number of equipment, the quantity, the amount PCB (these figures correspond to the information mentioned in the consulted sources) and the calculated gross weight. The last figures we also presented in figure 2. If a country indicates that the equipment that originally has been inventoried has been cleaned up or only a small amount is left, we present the remaining gross quantity as < 1.000 tonnes. If we compare the figures in the different member states some striking observations can be made:

- Eleven member states have indicated that the amount of PCB contaminated equipment is quite low (indicated as <1000 tonnes). All conclusions are based on the results of an inventory. Although inspectors in (some) member states verify and control the data which have been delivered, we could not discover information of the results of the verification by executing site visits to check the completeness and correctness of the information.
- The relation between the number of transformers and capacitors is very different and in some cases the opposite, e.g. France has only less than 1 percent capacitors and Poland has 250 times more capacitors.
- The number of transformers in some countries seems to be very small, occasionally below 1.000. It would be interesting to know the total number of transformers and whether those have a PCB free declaration.

Table 5. Remaining quantity of PCB contaminated material in member states.

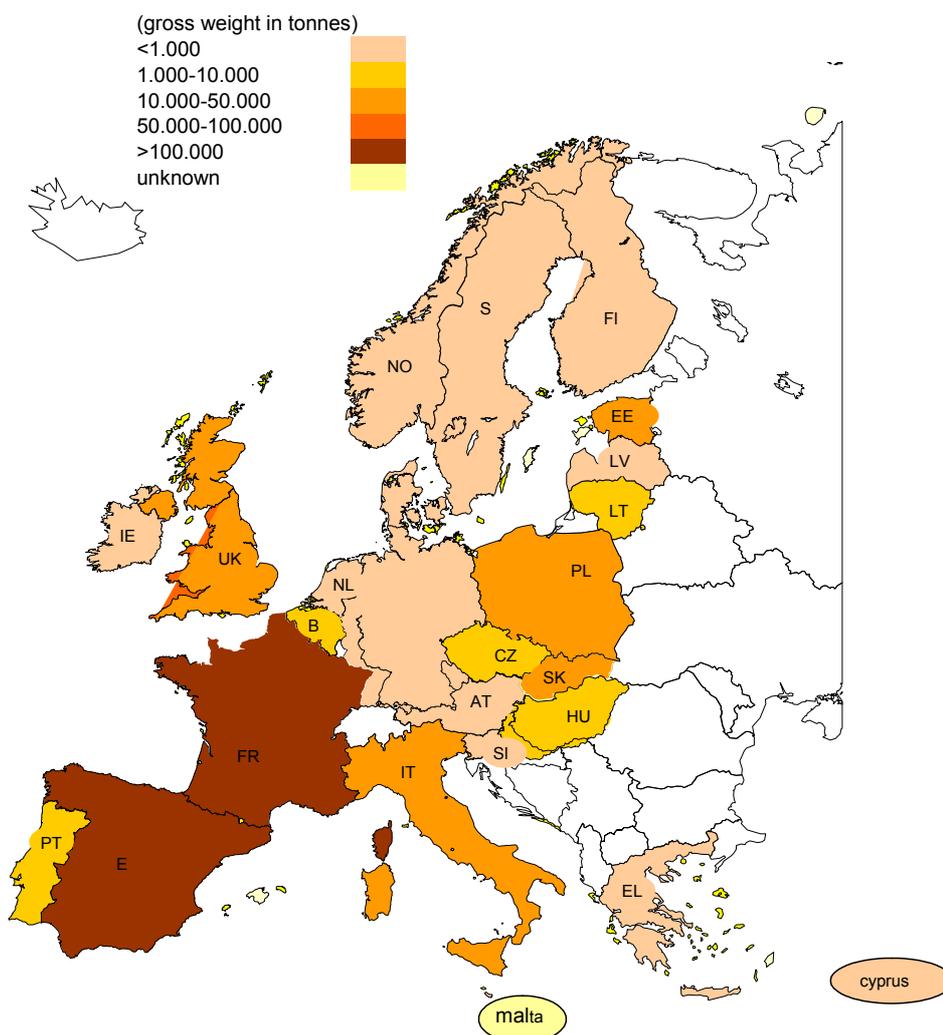
Country	Quantity mentioned in source				Remaining quantity converted into tons (gross weight)
	Remaining quantity (number equipment)	Remaining quantity (in tonnes gross weight)	Remaining quantity in tonnes PCB	Source	
Austria	> 500 ppm should be 0. In 1996 about 50 PCB equipment was inventoried and notified to commission			1,2	<1.000
Belgium	Flanders: 3000-4000 objects Brussels: 736 objects			1	5000 1000
Cyprus	> 500 ppm: 1 transformers 50-500 ppm: 120 transformers			1	<1.000
Czech Republic	Total 20883 transformers 136 (1541 uncertain) capacitors 10549 (2751 uncertain) small capacitors (< 5dm3) 9698		494 – 3564 PCB containing oil	1	10.400
Denmark	few at the most			1	<1.000
Estonia	20.000 transformers	30000 ton		3	30.000
Finland	< 10 objects (large capacitors) unknown number small capacitors			3	<1.000
France	545.610 objects (508076 transformers, 3537 capacitors)		33462	3	762.220
Germany		37.000 ton in 1998, now very few		3	<1.000
Greece	Transformers: 470 Capacitors: 14210 Stored equipment: 1200			2	<1.000
Hungary	1.435 transformers and 14.585 capacitors)		238 ton (oil)	1	2.590
Ireland	64 transformers, 127 capacitors, 99656 small capacitors and 336.114 objects not inventoried	In 2001 333 ton PCB.		3	<1.000
Italy	27 out of 28 regions registered 19.778 ton PCB equipment		>114 tonnes PCB	2	>20.000
Latvia	4.300 objects	350 ton, gross weight		3	350
Lithuania		1100-1300 ton equipment		1	1.300
Malta					
Netherlands	few at the most (transformers)			3	<1000
Norway		238 ton PCB in small PCB items		3	<1.000
Poland	250.000 capacitors 1.000 transformers	6000 ton PCB oil, 7500 ton capacitors		3	13.500
Portugal		Equipments working 1.471 ton, End of life Equipments off duty 401 ton		1	1.872
Slovakia	23.913 objects			1	12.000
Slovenia	120 transformers 3500 capacitors 15 other equipment	-328 tonnes gross inventoried plus -about 50 tonnes of transformers identification not concluded yet -expected to be less than 650 tonnes of small capacitors		3	1.028
Spain		210000		3	210.000
Sweden	none			1	<1.000

Country	Quantity mentioned in source				Remaining quantity converted into tons (gross weight)
	Remaining quantity (number equipment)	Remaining quantity (in tonnes gross weight)	Remaining quantity in tonnes PCB	Source	
United Kingdom	Number of objects England/Wales 40825 Scotland 321 N-Ireland 1			3	40.000-50.000
TOTAL					1,1 million

Source: 1=Questionnaire EuroPCB, 2=EU files, 3=Other (see fiche)

According to our approach we estimate the total gross quantity on 1,1 million tonnes which corresponds with an amount of about 350.000 ton PCB containing liquid (30 percent of gross weight). The amount of pure PCBs in the liquid is less. If we compare the data we have calculated with the data in the EU-report (3) we may conclude the general outcome is similar although, because of the different approach, the total result differs. The EU report comes to a total of 165.835 tonnes of PCB liquid. The difference between the number of 165.835 tonnes and 350.000 tonnes is mainly based on the interpretation of the quantity of PCB containing equipment in France. The French source (6) mentions a number of more than 500.000 PCB contaminated transformers and 33.462 tonnes (pure) PCB. If we use the general rule of 500 kg PCB containing liquid each transformer; the quantity in France will become 250.000 tonnes PCB containing liquid with PCB in stead of 33.462 tonnes as the EU report mentioned.

Figure 2. Estimation of remaining gross weight of PCB containing equipment.



It is difficult to express the extent of PCB removal as the percentage of the remaining quantity and the original quantity. The original quantity is in many cases not known and data of (previous) disposal is not complete. If we compare the data of the different member states sometimes significant differences occur. It is logic that the amount of transformers / capacitors in small countries is less. The number of (possible PCB containing) equipment like transformers is related to a number of criteria: one of them will be the electricity production / consumption. To give an impression of the magnitude of the (possible PCB containing) equipment we have added the electricity production (over the year 1991) in each member state to the table (source Euro stat). On the other hand the extent of using PCBs as dielectric fluid may differ. A Dutch investigation pointed out the extent of PCB use depends on the brand and origin of the equipment (7). Brands in countries in which PCB production took place seem to have a higher use of PCB. Some brands have used alternatives like mineral oil or dry transformers. In table 6 we present the data described in table 4 and 5 next to each other. Next to the electricity production we add the total number of transformers in a member state. We have only found data of Ireland and the Netherlands. According to the figures in table 6 it looks impossible to determine a consistent view. Only the figures in some neighbouring countries like Belgium and the Netherlands look comparable. Also some countries with a high energy production like France and Germany show comparable numbers. Some countries have a remarkable set of data. Estonia has reported to have a large amount of PCB waste compared to the energy production.

For obtaining a more consistent view it would be interesting to know the number of all equipment (produced before 1986 and after 1986). The equipment before 1986 would be more PCB suspicious. A next step would be to obtain a view of all types and level of PCB contamination. This information is useful to create a similar PCB list of transformers (like the ANZECC for capacitors). However we must realize transformers can be refilled with other liquid.

The total amount of equipment that has been disposed until 2005 is at least 0,5 million tonnes gross weight PCB waste. The remaining amount of equipment is at least 1,1 million tonnes. This corresponds with an amount of about 350.000 ton PCB containing liquid (30 percent of gross weight). We assume that all equipment has to be treated as PCB waste. We must realize that a number of inventories might not be completed and we lack information (Malta, Walloon region) so this total amount is a minimum. On the other hand information on recent disposal has not been taken into account. Most of the remaining quantity can be attributed to France and Spain. In those countries the largest part consists out of equipment with 50 to 500 ppm PCB which may be used until end of life. The capacity in the EU to incinerate PCB liquid is enough to treat all waste within less than 5 years. The capacity to dismantle and clean all equipment (transformers) is limited and would take more than 10 years to treat the equipment. Normally pre treatment is the first step of the removal. After pre treatment the PCB contaminated oil and other small material should be incinerated and the metal can be recycled.

Table 6. Quantity removed of PCB contaminated material versus (estimation of) remaining quantity PCB equipment in member states.

Country	Power station generation (GWh) in 1991	Total number of transformers (including PCB free)	Quantity removed (tonnes gross weight)	Remaining quantity converted into tonnes (gross weight)
Austria	50182		3.735	<1.000
Belgium	71195		29.000	2.500
Cyprus	2077			<1.000
Czech Republic	60530		820	10.400
Denmark	36328			<1.000
Estonia	14267		95	30.000
Finland	57985			<1.000
France	451417		154.596	762.220
Germany	535595		310.000	<1.000
Greece	35743		794	<1.000 ¹
Hungary	29963		24	2.590
Ireland	14929	140.000	261	<1.000
Italy	221859			>20.000
Latvia	5644			350
Lithuania	21863			1300
Malta	1419			0
Netherlands	74292	150.000	15.000	<1000
Norway	110652		614	<1.000
Poland	132728			13.500
Portugal	29744		275	1.872
Slovakia	22260			12.000
Slovenia	12742		848	1.028
Spain	154708			210.000
Sweden	146958		2.000	<1.000
United Kingdom	321283		25.000	40.000-50.000
Total			0,5 million	1,1 million

5. Conclusions

The main conclusions of this investigation are:

- In general the legislation on ban and phasing out of PCBs has been implemented in almost all member states. In view of a number of procedures we also must conclude that a number of member states still have to improve their legislation or fulfil some obligations.
- Almost all member states use the EU limit of 50 ppm for determining whether material is PCB contaminated. Only Austria, the Netherlands and Sweden make use of a different value.
- A way to stimulate the disposal of PCBs is to set up a regulation on ground of which companies may submit a request for financial support (subsidy grant). The experiences in Belgium and Netherlands pointed out that such regulation is not decisive for companies for replacing their equipment.
- Most member states have executed at least one inventory and some have a regulation which obliges holders of PCB containing equipment / material to notify the presence and removal of equipment. A general observation we can make is that extent and the target group of the inventories diverge.
- Our view is that the quantity of PCBs in countries in which production of PCBs took place is relatively higher than other countries. The quantities removed / present in Germany, France, Spain and UK ground this.
- We estimate the remaining quantity of PCB containing oil on 350.000 ton. The total gross weight of the equipment we estimate on 1,1 million tonnes. We must realize that a number of inventories might not be completed and we lack information (Malta, Walloon region) so this total amount is a minimum. On the other hand information on recent disposal has not been taken into account. If we compare this amount with the amount which has been disposed until now (at least 0,5 million tonnes gross weight) we might conclude the EU as a whole is not half way (30 percent). On the other hand about 10 member states have indicated they (almost) have solved the PCB problem.
- The capacity for incineration in Europe for the disposal of PCB containing equipment seems sufficiently, surely if we consider that the equipment < 500 ppm PCB in countries with a large quantity (Spain and France) may be disposed at their end of life. The capacity for dismantling equipment seems limited for treating all equipment within a short period (5-10 years). On the other hand the exception member states can make for equipment with 50 to 500 ppm PCB results in a much longer period of phasing out.
- The possibilities for dismantling and incineration in the EU are not present in each member state. In many cases shipments between member states must take place.
- Although trade in PCBs is forbidden there will always be a risk PCB containing equipment will be shipped out the EU similar to the export of (second hand or waste) CFC containing equipment or other electronic equipment.
- This investigation only focused on electrical equipment. The pure amount of remaining PCBs should be present in this sector (more than 80 percent). The EU-report (3) indicates that other very large waste streams (demolition waste, waste oil, shredder waste, sewage sludge and compost) might be contaminated with PCBs. The concentration of PCBs is in most cases much lower (< 50 ppm PCB).

6. Recommendations

- With the available information it is difficult to express the reliability of the numbers. A detailed list of all types of transformers (including year of construction) and their characteristics could help determining the completeness and correctness of the data. For this all member states should report all types of transformers. As a start a pilot could be started in which a few countries gather the information and compare the results. Article 10 of the Council Directive 96/59/EC states the Commission will set up a list of capacitors, resistors and inductance coils, containing PCBs. This (pilot) project could support making such list.
- Some countries report a large number of PCB capacitors and only few PCB transformers. Closer examination of this phenomenon is useful.
- To keep track on the process of phasing out it is important to monitor the amount and destination of the PCB waste. The exchange of information on shipments between member states could improve the quality of the figures. Due to the poor data on historic disposal of PCB waste, the importance of national waste statistics is obvious. Article 4 of the Council Directive 96/59/EC already obliges member states to set up a system in which changes are registered.
- To enlarge the historic data and to obtain view of companies who have disposed PCB waste the files of treatment facilities can give information. It also could be used to detect companies who have not reported to the competent authority. Another approach is the use of the files of the electricity companies and select the customers to which they deliver high or mid voltage.

References

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3. Helsinki Commission, PCBs a compilation and evaluation of the information given by the contracting parties with the focus on legislative situation, current uses, stockpiles and releases (July 2001)
4. OSPAR Commission Assessment of implementation of PARCOM decision 92/3 (2002) (OSPAR Convention, assessment of Contracting Parties' Implementation Report on PARCOM Decision 92/3 on the Phasing Out of PCBs and Hazardous PCB Substitutes, 2002)
5. European Commission, Mr. M. Pohlmann, administrator Production, Consumption and Waste: research of documents sent to the EU by member states.
6. France: MINISTERE DE L'ECOLOGIE ET DU DEVELOPPEMENT, NATIONAL DE DECONTAMINATION ET D'ELIMINATION DES APPAREILS CONTENANT DES PCB ET PCT (2003)
7. Ministry of Housing, Spatial Planning and Environment, The executing of PCB-regulation for transformers: enforcement of phasing out PCBs containing transformers in the grid.

Annex1. Relevant section in Study to facilitate the implementation of certain waste related provisions on the Regulation on Persistent Organic Pollutants (POPs).

country	PCB containing liquid [t]	PCB containing liquid [t/yr]	reference
AT	0	0	national PCB inventory 2000
BE	7,528	753	national PCB inventory 2001
CY	0	0	
CZ	4,059	406	national PCB inventory
DE	60	6	national PCB inventory 2002
DK	0	0	national PCB inventory 2001
EE	50	5	national PCB inventory 2004
ES	111,300	11,130	national PCB inventory 2001
FI	1	0	national PCB inventory 1999
FR	33,462	3,346	national PCB inventory 2002
GR	65	7	national PCB inventory 2001
HU	56	6	national PCB inventory
IE	0	0	national PCB inventory 1999
IT	4	0	national PCB inventory 2004
LT	138	14	national PCB inventory 2004
LU	150	15	national PCB inventory 2003
LV	206	21	national PCB inventory
MT	0	0	
NL	0	0	national PCB inventory 2000
PL	6,790	679	national PCB inventory
PT	466	47	national PCB inventory 2002

country	PCB containing liquid [t]	PCB containing liquid [t/yr]	reference
SE	0	0	national PCB inventory 2000
SI	0	0	
SK	500	50	national PCB inventory
UK	1,000	100	national PCB inventory 2001
EU-25	165,835	16,584	
EU-15	154,036	15,404	
EU-10	11,799	1,180	

Table 4-38: amount of PCB containing liquids, except for domestic equipment, in the time of examination and per year with an estimated time of elimination of 10 years in the EU.

country	liquids amount [t]	liquids amount [t]	liquids amount [t]	liquids amount [t]	equipment amount [t]	item of equipment	reference and year
	all	Capacitors	Transformers	other	all	all	
AT	0	0	0				national PCB inventory 2000
BE (WL ⁶)	2,430	30 ³	2,400 ²	x ⁵		7,866 ¹	national PCB inventory 2001
BE (FL ⁷)	5,098	48 ³	5,050 ²	x ⁵		14,946 ¹	national PCB inventory 2001
CY							
CZ	4,059	2,702	325	1,000		20,833	national PCB inventory 2002
DE	60						national PCB inventory 2001
DK	0	0	0				national PCB inventory 2004
EE	50						national PCB inventory 2001
ES	111,300				141,000		national PCB inventory 2001
FI	1					100	national PCB inventory 2002
FR	33,462					545,610	national PCB inventory 2001
GR	65	58	7	x ⁵		13,185 ¹	national PCB inventory (2002)
HU	56	56			546	12,436	national PCB inventory 1999
IE	0.325		0.325				national PCB inventory 2004
IT	4 ⁴					3	national PCB inventory 2004
LT	138	51	87				national PCB inventory 2003
LU	150						national PCB inventory
LV	206	138	68			4,299	
MT							
NL	0						national PCB inventory 2000
PL	6,790	2,960	3,830		7,620	251,000	national PCB inventory

country	liquids amount [t]	liquids amount [t]	liquids amount [t]	liquids amount [t]	equipment amount [t]	item of equipment	reference and year
PT	466					855	national PCB inventory 2002
SE	0						national PCB inventory 2000
SI							
SK	500	300 ³	200 ²	x ⁵		31,261	national PCB inventory (2003)
UK	1,000						national PCB inventory 2001

- 1: BE (WI): 7,866 items of equipment, thereof 4,801 transformers and 2,967 capacitors
 BE (FI): 14,946 items of equipment, thereof 10,100 transformers and 4,774 capacitors
 GR: 13,185 items of equipment, thereof 497 transformers and 12,631 capacitors
- 2: liquid amount of capacitors estimated on the assumption that one item of equipment contains in the average 10 kg of liquid.
- 3: liquid amount of transformers estimated on the assumption that one item of equipment contains in the average 500 kg of liquid
- 4: liquid is pure PCB
- 5: no estimation possible
- 6: WI = Wallonia
- 7: FI = Flamen

Table 4-39: EEE containing liquids of transformers, capacitors and others and amount and item of equipment

Annex 2. Questionnaire to member states

Questionnaire EuroPCB competent authorities in the Member states

Country:

Name and function:

E-mail:

Telephone:

No	Subject	Question	Relevant Article in 96/59/EC
1	Legislation	Which (legal) measurements does your country take to ensure that PCB containing equipment will be disposed before 2010?	3
2		Did your country have or had a subsidiary regulation which stimulates companies to dispose PCB-containing equipment?	3
3		Give a short description of this subsidiary regulation.	3
4		Is the reuse of PCB restricted and how is this regulated?	5
5		What kind of license companies have to deal with the removal of PCBs?	8
6		Does your country use the PCB limits as fixed in the Directive 96/59 (0,005 % and between 0,05 and 0,005%). If not which limits your country use?	2
7		Which authority is responsible for the enforcement of the regulation which forces companies to dispose their PCBs?	
8	Inventory of PCBs	Did your country perform an inventory on PCB-containing equipment?	4
9		Describe the method your country used to inventory this equipment. How does the gathered data will be kept up to date (in case companies remove the PCBs)?	4
10	Plan(s) concerning PCBs	Does your country have set up a plan on the cleaning and disposal of PCB containing equipment which has been inventoried? If so, can you send us a copy of this plan?	11
11		How does your country foresee in the collection and removal of small PCB containing equipment (less than 5 dm ³ volume PCB)?	11
12	Disposal	Do you have an overview of companies who are licensed to remove PCBs and can you supply a list of those companies?	4
13		What kind of disposal facilities does your country have? For example incineration or permanent storage (e.g. salt mines).	
14	Results	Can you give the effects of each measurement your country has taken, for example the quantity of PCB-containing equipment that has been disposed making use of a subsidiary regulation?	3
15		When took the inventory or inventories on (possible) PCB containing equipment place?	4
16		Please send the summary of the results of the inventory / inventories to us.	4
17		Do you have reports on the quantities of PCBs that have been removed? If so can you supply a copy?	4
18		Do you have reports on the quantities of PCBs that have been removed by disposal facilities in your country? If so can you supply a copy?	

Directive 96/59/EC you can find on <http://europa.eu.int/eur-lex/>

Annex 3. Response to questionnaire and first draft report.

Country	Questionnaire returned	Response on draft (10th of August)
Austria	yes	yes
Belgium	Flanders	yes
	Brussels	yes
	Wallonia	
Czech Republic	yes	yes
Cyprus	yes	yes
Denmark	yes	yes
Estonia	yes	
Finland	yes	yes
France	yes	yes
Germany		yes
Greece	yes	yes
Hungary	yes	yes
Ireland		
Italy	yes	yes
Latvia	yes	
Lithuania	yes	yes
Luxembourg	(no CLEEN member)	
Malta		
Netherlands	yes	yes
Norway	yes	yes
Poland		
Portugal	yes	yes
Slovakia	yes	
Slovenia		yes
Spain		
Sweden	yes	
United Kingdom		