

**STOCKHOLM CONVENTION ON PERSISTENT
ORGANIC POLLUTANTS (POPs)**

NATIONAL

IMPLEMENTATION

PLAN

REPUBLIC OF POLAND

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INTRODUCTION

Persistent organic pollutants (POPs) are chemical substances highly resistant to degradation in the environment, subject to bioaccumulation, especially in fat cells, which consequently has a negative impact on human and animal health, and the environment.

Persistent organic pollutants are volatile with steam and this property is the cause of their transmission over long distances from sources of release. They accumulate in particular in Arctic and mountain regions where airborne POPs undergo condensation.

The increase in concentrations of these substances in the environment by the 1960s due to their use in pesticides and biocides, made it necessary to take measures to withdraw them from production and use, which resulted in the Stockholm Convention on Persistent Organic Pollutants.

The Stockholm Convention, made in Stockholm on May 22, 2001 (Journal of Laws of 2009 No. 14, item. 76), hereinafter referred to as "the Convention", is an international agreement concluded after three years of negotiations, conducted under the auspices of the United Nations Environment Programme (UNEP), in order to protect human health and the environment against persistent organic pollutants. The Convention entered into force 90 days after submission of ratification documents by 50 parties on 17 May 2004. Currently (as of June 30, 2010) The Convention has 170 Parties and 152 signatories [1], including the European Union.

Under the Act of 13 June 2008 to ratify the Stockholm Convention on Persistent Organic Pollutants, hereinafter "the Act on ratification of the Stockholm Convention", the Convention was ratified by the Polish President on 30 September 2008. The Convention entered into force in the Republic of Poland on 21 January 2009 under the government's statement of 2 December 2008 on the binding force of the Stockholm Convention on Persistent Organic Pollutants, signed in Stockholm on 22 May 2001 (Journal of Laws of 2009, No. 14, item 77).

Each Party is obliged, under Article 7 of the Convention, to draft a national plan to implement its obligations under the Convention, and to review and update it from time to time.

In 2004, Poland has been developed the National Program of Implementation of the Stockholm Convention [2], under the GF/POL/01/004 *Enabling activities to facilitate early action on the implementation of the Stockholm Convention on Persistent Organic Pollutants* project, drawn up by the Institute of Environmental Protection in Warsaw and financed by the UNIDO.

The National Program for the Implementation of the Stockholm Convention was developed in accordance with the draft *Guidance for Developing a National Implementation Plan for the Stockholm Convention* [3].

Preparation of the plan of implementation of the Convention in Poland used a financial mechanism provided for in the Convention, under which developing countries and countries with economies in transition can use assistance of the developed countries. Financial mechanism for the Convention is ensured by GEF administered by the World Bank. Its first initiative was to award funds to several countries, including Poland, to deliver pilot projects aimed at facilitation of activities determining effective implementation of the Convention.

GEF decided to award funds to Poland to deliver the GF/POL/01/004 project in 2001. This project was implemented under contract no. 2001/369 signed between UNIDO, acting as the international coordinator of the GEF projects under the Convention, and the Institute of Environmental Protection. For coordination and professional supervision over the project, the Minister of Environment appointed the national Steering Committee, comprising representatives of relevant ministries (environment, health, labour, economy, agriculture, finance, foreign affairs and national defence), as well as representatives of science, industry

and NGOs. The program of 2004 has been approved by the Minister of Environment but has not been submitted to relevant authorities because Poland had not yet been a party to the Convention.

The present document fulfils the obligations under Article 7 of the Convention, which obliges the Parties to draw up and submit to the Secretariat of the Convention and the European Commission national plans for implementation of the Stockholm Convention. Entry of the Convention into force for Poland as of 21 January 2009 stipulates an obligation to submit the National Plan of Implementation of the Stockholm Convention, hereinafter "NPISC" by 20 January 2011. The document includes, among others, a legal status analysis, results of monitoring and inventory of substances covered by the Convention's provisions and analysis of tasks as at 30 June 2010. The primary objective of the NPISC is to organize research and monitoring of the environmental condition in terms of pollution with POPs and hazards from POPs for humans and the environment. Continuous research and monitoring will be the basis for taking actions to eliminate the POPs release sources, reduce the pollution volume and properly manage the existing waste. These actions will form part of environmental protection programmes in a specified time frame. The scope of environmental condition research and control will change from time to time due to changes in the scope of the Convention and also due to the changing economic and social conditions, and scientific and technical progress.

1. CURRENT LEGAL STATUS AND TASKS OF THE PUBLIC ADMINISTRATION

1.1. Current legal status of POP handling

1.1.1. International agreements on persistent organic pollutants

In addition to the Convention, international agreements on persistent organic pollutants include:

- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, issued in Basel on 22 March 1989 (Journal of Laws, 1995 No. 19, item 88), hereinafter the "Basel Convention",
- The Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, signed in Rotterdam on 10 September 1998 (Journal of Laws of 2008 No. 158, item 990), hereinafter the "Rotterdam Convention",
- Protocol to the 1979 Convention on Long Range Transboundary Air Pollution on Long-range persistent organic pollutants (POPs) (Official Journal EC L 81 of 19.3.2004 p. 37; Official Journal EU Special edition in Polish Chapter 11, vol. 50, p. 146), hereinafter the "Protocol on POPs".

1.1.2. Legislation in the European Union and the Republic of Poland

1.1.2.1. General requirements for chemicals

Changes made in recent years in European Union legislation on chemicals are showing an increasingly strong trend toward abandonment of legislation in the rank of directives and adoption of regulations instead. Under the Treaty, regulations are of general scope, are entirely binding and are directly applicable in all the Member States. Such effect converges legislative, executive and administrative provisions in the Member States and promotes formation of identical legal framework throughout the European Union market. Lack of the need to transpose the regulations also shifts the burden of rulemaking from the level of national legislature to the level of the European legislature which in turn leads to reduction in the number of legal acts.

Recently adopted EU regulations on chemicals repealed a number of directives adopted as early as in the 1970s. This action results in the gradual elimination from national laws of provisions repeating the provisions of the regulations and the remaining legal provisions focus on administrative, technical and reporting tasks.

The basic legal act on chemicals in the European Union is the Regulation (EC) No. 1907/2006 of the European Parliament and the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 and Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC Official Journal EU L 136, 29.5.2007, p. 3, as amended), hereinafter the "REACH Regulation". The Regulation aims to ensure a high level of human health and the environmental protection, as well as a free movement of chemicals within the European

Union, while enhancing competitiveness and innovation. The European Chemicals Agency (ECHA) was established to effectively manage technical, scientific and administrative aspects resulting from this act. The Agency is an independent body within the European Union, whose main task is the registration of entities producing and importing chemicals into the European Union and registration of chemicals.

The use of chemicals should be in compliance with the Regulation (EC) No. 1272/2008 of the European Parliament and the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006 (Official Journal EU L 353, 31.12.2008, p. 1), hereinafter "Regulation (EC) No. 1272/2008." This act is addressed at manufacturers, importers, suppliers and downstream users of chemicals and defines the requirements for classification and labelling of substances and mixtures hazardous to human health and the environment.

Domestically, the act supplementing provisions of the above regulations is the Act of 11 January 2001 on chemical substances and preparations (Journal of Laws of 2009, No. 152, item. 1222, as amended), hereinafter the "Act on chemical substances and preparations".

To make provision for the European Union's strive to a single internal market, the policy on introducing restrictions in manufacturing and use in the European Union concerning some products - including chemicals - is conducted at the European level. REACH Regulation is the legal instrument for assessment of the effect of chemicals on human health and environment in the Union, as well as a guideline for placing bans on their production and use. This regulation provides a harmonized approach to defining chemicals assessment criteria in terms of hazards for human health and the environment, such as stability and ability to bioaccumulate. A complementary legal act on this issue is the Regulation (EC) No. 1272/2008 regulating free flow of substances, mixtures and products within the EU, while also adopting harmonized criteria for classification of substances and mixtures and regulations concerning labelling and packing of hazardous substances and mixtures.

Recognition of a chemical as a persistent organic pollutant performed by extending the lists of chemicals included in the Annexes to the Convention. Entry of a chemical onto the list is possible if the substance is characterized by physical and chemical properties meeting also the following conditions: persistence, toxicity and bioaccumulation in the environment and living organisms, and capability of long-range transport.

Chemicals, to be recognized as persistent organic pollutants, must firstly be recognized as such by the Convention's authorities. Inclusion of new chemicals in the scope of the Convention's provisions entails the need to adjust the Regulation (EC) No 850/2004 of the European Parliament and the Council of 29 April 2004 regarding persistent organic pollutants and amending Directive 79/117/EEC (Official Journal EC L 158, 30.04.2004, p. 7, as amended ; Official Journal EU Special edition in Polish, Chapter 15, vol. 8, p. 465) - hereinafter "Regulation (EC) No 850/2004".

Similarly to marketing, trading of chemicals in the EU is subject to a legal regime established in the regulations of the European Union. The legal act defining the trading rules is Regulation (EC) No 1272/2008. Complementary nature of national laws reduces domestic activities to the level of national supervision and control of the correct application of EU law. Chemicals traded as commodities, marketed under the applicable law, are subject only to the supervision and inspection of services and bodies appointed for that purpose.

1.1.2.1.1. Plant protection products

Regulation (EC) No 1107/2009 of the European Parliament and the Council of 21 October 2009 concerning the placing of plant protection products and repealing Directives

79/117/EEC and 91/414/EEC (Official Journal EU L 309, 24.11.2009, p. 1), hereinafter "Regulation (EC) No 1107/2009, which will come into force on 14 June 2011, repeals the Council Directive 79/117/EEC of 21 December 1978 prohibiting the marketing and use of plant protection products containing certain active substances (Official Journal EU L 33, 8.2.1979, p. 36, as amended; ; Official Journal EU Special edition in Polish Chapter 3, vol. 4, p. 33) in force since 1970s, hereinafter "Directive 79/117/EEC".

The regulation introduces bans on marketing and use of plant protection products containing certain active substances, including persistent organic pollutants.

In Poland, the act of 18 December 2003 on plant protection (Journal of Laws of 2008 No. 133, item 849, as amended) hereinafter the "Act on Plant Protection", is currently in force.

According to the law in force, marketing of a plant protection product requires authorization of the minister responsible for agriculture. Marketing authorization can be granted only to these plant protection products which, if used correctly as intended, are not hazardous for human or animal health or the environment, in particular plant production products that do not contain active substances posing such a hazard or for which the European Commission issues a decision prohibiting their use in plant protection products.

Under the above Regulation, plant protection products must not contain persistent organic pollutants.

1.1.2.1.2. Biocides

Act of 13 September 2002 on biocidal products (Journal Laws of 2007 No. 39, item 252, as amended) hereinafter the "Act on Biocidal Products", transposes into national law among others provisions of the Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market (Official Journal EC L 123 of 24.04.1998, p. 1; Official Journal EU Special edition in Polish Chapter 3, vol. 23, p. 3), hereinafter "Directive 98/8/EC". The Act lays down conditions for the marketing and use of biocidal products and active substances used in biocidal products in the Republic of Poland, including the requirements for efficacy and safety of their use, as well as the rules of mutual recognition of marketing authorizations and entries into the register of low risk biocidal products between Poland and other Member States of the European Union.

The Act aims at preventing hazards to human and animal health and to the environment which may be caused by biocidal products. Under this Act, the Minister of Health is authorized to request the European Commission to enter an active substance of a biocidal products into the register of active substances. He is also authorized to refuse to make such a request should an active substance intended for use in low-risk biocidal products be classified, according to regulations on chemical substances and preparations, as carcinogenic, mutagenic, teratogenic, allergenic, bioaccumulating or slowly biodegradable.

1.1.2.1.3. Persistent Organic Pollutants (POPs)

The issues concerning production, marketing and use of most persistent organic pollutant substances listed in the Convention were regulated as early in the late 1970s by introducing bans on production and restrictions on use.

National law on persistent organic pollutant substances mainly implements the provisions of EU legislation relating to chemicals and waste management. The EU legislation in this area consists of a number of legal acts of in the rank of directives, regulations and decisions issued by the European Union bodies.

In the territory of the European Union, provisions of the Convention have been introduced by Regulation (EC) No 850/2004. This regulation also includes requirements to be adopted in the Protocol on POPs.

Within the EU, also the Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) (Official Journal EC L 243, 24.9.1996, p. 31; Official Journal EU Special edition in Polish Chapter 1915, vol. 3, p. 75), hereinafter the "Directive 96/59/EC", along with its accompanying decisions is in force. The Directive is transposed into national legal regime on handling PCBs by the act of 27 April 2001 - Environment Protection Law (Journal of Laws, 2008 No. 25, item 150, as amended), hereinafter the "Environment Protection Law", and the regulations:

- of the Minister of Economy of 24 June 2002 on the requirements for the use and handling of substances posing a particular threat to the environment and the use and cleaning of the plant or equipment, which have been or are used for substances posing a particular threat to the environment (Journal of Laws no. 96, item 860), hereinafter the "Regulation on the requirements for the use and handling of substances posing a particular threat to the environment",
- of the Minister of Economy of 26 September 2002 on the determination of equipment, which could be used for substances posing a particular threat to the environment (Journal of Laws no. 173, item 1416), hereinafter the "Regulation on the determination of equipment, which could be used for substances posing a particular threat to the environment".

Provisions of the above regulations are complemented by the act on chemical substances and preparations defining the terms of, prohibitions and restrictions on production, marketing, use or purchasing of chemicals, as well as duties of public authorities in administrative tasks and their obligations under these regulations.

In the transport of persistent organic pollutants, the provisions of international and national laws listed in Annex 2, in items 1, 2, 22, 23, 26, 27, 36 and 52 apply.

1.1.2.1.4. Export and import of hazardous substances

Import of hazardous substances into the EU and export out of the EU are regulated by Regulation (EC) No 689/2008 of the European Parliament and of the Council of 17 June 2008 concerning the export and import of dangerous chemicals (Official Journal EU L 204, 31.7.2008, p. 1), hereinafter "Regulation (EC) No 689/2008".

Under this Regulation, the European Commission has been granted special powers to determine the types of chemicals that are banned from export outside the EU. On the basis of its authorization, the Commission decides which chemicals are subject to prohibitions and restrictions in international trade. Pursuant to the binding regulations, the export of persistent organic pollutants listed in Annexes A and B to the Convention is prohibited.

1.1.2.2. General requirements for waste management

The legal act defining the requirements for waste management in the European Union is the Directive of the European Parliament and Council 2008/98/EC of 19 November 2008 on waste and repealing certain Directives (Official Journal EU L 312, 22.11.2008, p. 3), hereinafter the "Directive 2008/98/EC".

This Directive lays down measures to protect the environment and human health by preventing and reducing the negative impacts of generation and management of waste and improve efficiency of resource use. The directive establishes the waste handling hierarchy, according to which national legislation should firstly require prevention of waste generation, and if it is not possible, preparation for reuse, recycling and other forms of recovery. Should waste be non-reusable it should be disposed, the least desirable disposal method being landfilling. In accordance with the "polluter pays" principle, costs of waste management must be covered by the original waste producer or by a current or previous holders of the waste. In this respect, Member States may adopt arrangements whereby the cost of waste management will be covered partially or entirely by the manufacturer of the product from which the waste originated and that distributors of such products may share these costs.

The issues of operating and technical requirements for waste management by providing resources, procedures and rules of conduct designed to prevent, as far as possible, negative effects of waste management on the environment are regulated by the Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste.

In the transport of waste, including persistent organic pollutants, directly applicable are provisions of Regulation (EC) No 1013/2006 of the European Parliament and the Council of 14 June 2006 on shipments of waste (Official Journal EU L 190, 12.7.2006, p. 1, as amended), hereinafter the "Regulation (EC) No 1013/2006". The regulation establishes control procedures and systems for the shipment of waste, depending on their origin, destination and route of shipment, the type of waste shipped and intended mode of dealing with waste at its destination and applies to shipments between Member States, within the EU and to export and import of waste.

Specific recommendations regarding handling of persistent organic pollutant waste are also defined in Regulation (EC) No 850/2004 which defines methods of dealing with waste containing persistent organic pollutants.

In the republic of Poland, waste management rules ensuring human life and health protection and environmental protection are defined in the Act of 27 April 2001 on waste (Journal of Laws of 2010 No. 185, item 1243, as amended) hereinafter "the Act on Waste," along with executive regulations.

Directions in waste management policy in Poland, including objectives in creating an integrated and adequate network of waste recovery and treatment installations and equipment meeting requirements defined in the environmental protection regulations are specified in the national waste management plan updated every four years. The plan, adopted in the Resolution of the Council of Ministers No. 233 dated 29 December 2006 on the "National Waste Management Plan 2010 (Official Gazette No. 90, item. 946), sets targets for elimination of persistent organic pollutants from the market, including the gradual removal of equipment containing PCBs, disposal of waste containing PCBs at home or abroad, and elimination of waste repositories that may contain persistent organic pollutants.

Recommended methods of dealing with waste oils, including those that may contain PCBs are defined in the Regulation of the Minister for Economy and Labour of 4 August 2004 on the detailed method of dealing with waste oils (Journal of Laws no. 192, item 1968), hereinafter the "Regulation on the detailed method of dealing with waste oil".

Requirements concerning such issues as designation of competent authorities, included in Regulation (EC) No 1013/2006 on the international shipment of waste, are transposed to Polish legislation in the act of 29 June 2007 on the international shipment of waste (Journal of Laws no. 124, item 859, as amended) hereinafter the "Act on the international shipment of waste".

Legal act which supports the process of eliminating persistent organic pollutant waste from the market is the Environmental Protection Law act. This Act lays down rules of handling

POP-containing products, imposes restrictions and prohibitions on their use. Detailed provisions are included in:

- the Regulation of the Minister of Environment of 9 December 2003 on substances posing a particular threat to the environment (Journal of Laws no. 217, item 2141), hereinafter the "Regulation on substances posing a particular threat to the environment " which lists the substances classified as persistent organic pollutants,
- regulation on the determination of equipment which could use substances posing a particular threat to the environment, including a list of PCB-containing equipment,
- Regulation on requirements for the use and handling of substances posing a particular threat to the environment, according to which the equipment containing PCBs should not be used longer than until 30 June 2010.

According to Regulation (EC) No 850/2004, waste containing persistent organic pollutants or contaminated with them are to be disposed of in a way ensuring destruction or irreversible transformation of POPs. These waste may be, however, recovered provided that persistent organic pollutants will not be recovered, recycled or reused as a result of the process.

National law in this respect - the Act on waste - defines detailed requirements for dealing with selected waste, including PCBs. The Act prohibits recovery of waste PCBs, recommending their disposal through incineration in waste incinerators or using other processes causing their permanent degradation.

1.1.2.3. Emission requirements

Directive of the European Parliament and the Council 2008/1/EC of 15 January 2008 concerning integrated pollution prevention and control (Official Journal EU L 24, 29.1.2008, p. 8), hereinafter "Directive 2008/1/EC", sets out requirements for industrial plants, the functioning of which is particularly important from the environmental impact perspective. The purpose of this directive is to take comprehensive measures for integrated pollution prevention and reduction of environmental pollution caused by certain activities. The list of activities covered by the directive lists the sources of POPs release into the environment. The main pollutants include chlorine and its compounds, fluorine and its compounds, PCDDs and PCDFs. Running of plants listed in the directive requires obtaining of a permission. Permission to operate a plant may be granted subject to the application of the best available techniques (BATs), ensuring elimination or reduction of environmental pollution.

Pursuant to Regulation (EC) No 166/2006 of the European Parliament and the Council of 18 January 2006 on the establishment of a European Pollutant Release and Transfer, amending Council Directives 91/689/EEC and 96/61/EC (Official Journal EU L 33, 4.2.2006, p. 1), hereinafter the "Regulation (EC) No 166/2006 ", the obligation to monitor releases and emissions from the plants which exceeded the threshold values for certain substances has been imposed. Managers of these plants are required to provide information about the release volume to relevant administration authorities. Based on this information, the European Pollution Release and Transfer Register (PRTR) [4] has been established, where the following threshold values have been adopted:

	Into the air [kg/year]	Into water [kg/year]
▪ hexachlorobenzene (HCB)	10	1
▪ PCDD/F (as TEQ)	0.0001	0.0001
▪ polychlorinated biphenyls (PCBs)	0.1	0.1

The Environmental Protection Law introduces requirements of the Directive (EC) No 2008/1/EC to the Polish legislation. The provisions contained in Title III, Section IV of the act on *Permissions for the introduction of substances or energy into the environment* define the rules for the granting permissions for economic activity. Prohibition on placing on the market and re-use of substances posing a particular threat to the environment is found in Article 160 of the Environment Protection Law act. The prohibition applies to PCBs and asbestos.

The Regulation on substances posing a particular threat to the environment lists the following substances posing a particular threat to the environment:

- aldrin (C₁₂H₈Cl₆),
- dieldrin (C₁₂H₈Cl₆O),
- endrin (C₁₂H₈Cl₆O),
- isodrin (C₁₂H₈Cl₆),
- DDT (C₁₄H₈Cl₅),
- hexachlorocyclohexane (HCH),
- lindane (γ-HCH).

As at June 30, 2010, these substances (except isodrin, HCH and lindane) are covered by the Convention.

In accordance with Article 378 of the Environmental Protection Law act, Marshal of the Voivodship is the public authority competent in the following matters:

- 1) projects and events in industrial sites operating a plant classified as a project likely to always have a significant impact on the environment within the meaning of the Act of 3 October 2008 on Providing Information on the Environment and Environmental Protection, Public Participation in Environmental Protection and on Environmental Impact Assessment;
- 2) project likely to always have a significant impact on the environment within the meaning of the act of 3 October 2008 on Providing Information on the Environment and Environmental Protection, Public Participation in Environmental Protection and on Environmental Impact Assessment, delivered in areas other than listed in item 1;

Regulation of the Council of Ministers of 9 November 2010 on projects that may significantly affect the environment (Journal of Laws No. 213, item 1397), hereinafter the "Regulation on the projects likely to significantly affect the environment" introduces to the Polish legislation a list of plants subject to the requirements of the Directive (EC) No 2008/1/EC.

The Act of 17 July 2009 on the management system for emissions of greenhouse gases and other substances (Journal of Laws no. 130, item 1070, as amended), hereinafter the "Act on the management of emissions", ensures implementation of EC Regulation No 166/2006.

Regulation of the Minister of Environment of 20 December 2005 on the emission standards for installations (Journal of Laws no. 260, item 2181, as amended), hereinafter the "Regulation on emission standards of installation", sets emission standards for the introduction of gas or dust into the air for industrial installations: combustion of fuels, including waste incineration and co-incineration, and installations using volatile organic pollutants (VOCs). The Regulation establishes the limit of dioxins and furans emissions from waste incineration and co-incineration and processes using VOCs in the amount of 0.1 TEQ ng/m³ of exhaust. Provisions of the Regulation do not apply to the sources, where combustion products are used for heating, drying or other treatment of objects or materials.

The Regulation of the Minister of Environment of 24 July 2006 on conditions to be met for the introduction of sewage into the water or soil, and on substances particularly harmful to the

aquatic environment (Journal of Laws no. 137, item 984, as amended), hereinafter the "Regulation on the conditions to be met for the introduction of sewage into the water or soil", identifies the requirements for pollution limit values for treated waste water.

Of persistent organic pollutants for which limits in the treated industrial waste water have been established, the Annex to the Regulation lists aldrin, dieldrin, endrin, HCH, HCB, DDT and PCBs.

Substances covered by the Convention belong to the group of substances that are particularly harmful, causing water pollution, which should be eliminated; thus, the regulation does not allow for their presence in waste water subjected to treatment, except:

- HCB in industrial effluents from the following processes: HCB production and processing (up to 1 mg/L monthly average), production of perchlorethylene (PER) and tetrachloromethane by perchlorination (up to 1.5 mg/L monthly average), the production of trichlorethylene or perchlorethylene using other processes (up to 1 mg/L monthly average), as well as other industrial processes (up to 1 mg/L monthly average),
- PCDD/F in industrial effluents from treatment of smelter gases from thermal waste transformation processes (up to 0.3 ng/l).

1.1.2.4. Requirements concerning maximum permissible concentrations of persistent organic pollutant substances in the environment and products

Table I and II show the limit values for persistent organic pollutant substances for specific elements of the environment and products, developed on the basis of the following legal acts:

- Regulation of the Minister of Health of 29 March 2007 on the quality of water intended for human consumption (Journal of Laws No. 61, item 417, as amended).
- Regulation of the Minister of Environment of 20 August 2008 for the classification of bodies of surface water (Journal of Laws no. 162, item 1008),
- Regulation on conditions to be met for the introduction of sewage into the water or soil, and on substances particularly harmful to the aquatic environment,
- Regulation of the Minister of Environment dated 9 September 2002 on standards for soil quality and soil quality standards (Journal of Laws No. 165, item 1359),
- Regulation of the Minister of Environment of 16 April 2002 on the types and concentrations of substances that cause the output is contaminated (Journal of Laws no. 55, item 498),
- Regulation of the Minister of Agriculture and Rural Development of 23 January 2007 on permissible levels of undesirable substances in animal feed (Journal of Laws no. 20, item 119),
- Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs (Official Journal EU L 364, 20.12.2006, p. 5),
- Act of 16 December 2005 on products of animal origin (Journal of Laws, 2006 No. 17, item 127, as amended),
- Regulation of the Minister of Agriculture and Rural Development of 28 July 2006 on how to deal with illicit substances, residues of chemical, biological, medicinal products and radioactive contamination of animals and animal products (Journal of Laws of 2006, no. 147, item 1067).

Wastes in which the concentration of a substance listed on the list of persistent organic pollutants is equal to or greater than those given in Table I are defined as POPs-containing waste (hazardous waste).

Table I. Limit concentrations of POPs in waste

Name of the substance in the waste	Limit concentration
Aldrin	50 mg/kg
Chlordane	50 mg/kg
Dieldrin	50 mg/kg
Endrin	50 mg/kg
Heptachlor	50 mg/kg
Hexachlorobenzene	50 mg/kg
Mirex	50 mg/kg
Toxaphene	50 mg/kg
Polychlorinated biphenyls (PCBs)	50 mg/kg*
DDT (1,1,1-trichloro-2,2-di(4-chlorophenyl)ethane)	50 mg/kg
Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD / PCDF)	15 µg/kg**
Total αβγ HCH	50 mg/kg
Hexabromobiphenyl	50 mg/kg

* Concentration calculated according to European standards EN 12766-1 and EN-12766-2.

** Concentration calculated taking into account toxic equivalents (TEQs) of the compounds included in the substance.

Waste generated in present times contain POPs being unwanted by-products. POP-containing waste have been divided by abundance into three groups:

- ▶ Group A - waste in which, in rare cases, the POPs content exceeds the agreed limit value,
- ▶ Group B - waste in which, in many cases, the POPs content exceeds the agreed limit value,
- ▶ Group C - waste of uncertain risk, including due to the pollution level variability or uneven weight distribution of POPs in waste.

Waste can also be divided into groups by frequency of exceeding the POPs concentration limits:

Wastes containing PCDD/Fs. Concentrations of PCDD/Fs exceeding 10 mg/kg in less than 50% of installations were found for several types of waste: in the fly ash, in remains of the purification of waste gases from secondary aluminium smelting, dust metals used in the process of secondary copper smelting, and the residue after wet purification of exhaust gases from waste incineration plants. Exceeding concentration 10 mg/kg in less than 10% the tested installation were found in flue gas cleaning waste from municipal waste incineration plants, the flue dust from the home hearths and in ashes from biomass incineration.

Wastes containing PCBs. Excess concentrations of PCBs of 30 mg/kg in less than 50% of the tested installations were found for a small group of waste. These are oils with dielectric properties, hydraulic oils, equipment containing or contaminated with PCBs, waste adhesives and gaskets, cables and construction wastes contaminated with PCBs. In a few cases - less than 10% of the tested installations - the excess concerned mineral oils, "other waste from demolition", light fractions and dust from shredding motor vehicles.

POP pesticide waste. As these substances have been withdrawn from use, waste containing them are the remains of "waste repositories" - demolition waste in the form of concrete rubble and sometimes contaminated soil.

Other POP wastes. Polycyclic aromatic hydrocarbons (PAHs) are formed as by-products in combustion processes and are released into the air with dust emissions. They can be found in waste from purification of waste gases from thermal processes, in sediments from dredging of rainwater draining channels and rainwater sedimentation tanks, as well as in coke industry products and waste.

Table II. Maximum permissible concentrations of persistent organic pollutants in various elements of the environment and in products

Utilities or products	Maximum permissible concentration											
	HCBs	PCBs	PCDD/Fs	Aldrin	Dieldrin	Endrin	Chlordane	DDT	Heptachlor	Hexachlorocyclohexane (HCH)		
										α	β	γ
WATER												
Potable [$\mu\text{g/L}$]	0.1*	-	-	0.03*	0.03*	0.1 *	0.1 *	0.1 *	0.03*	0.1 *	0.1*	0.1*
in streams, brooks, rivers and lakes and other natural and artificial water reservoirs [$\mu\text{g/L}$]	0.05**	-	-	0.01 (total including Isodrin)***			-	0.025***	-	0.04**		
in the internal, transitional waters and coastal sea waters [$\mu\text{g/L}$]	0.05**	-	-	0.005 (total including Isodrin) ***			-	0.025***	-	0.02**		
WASTE WATER												
treated industrial effluents [$\mu\text{g/L}$]	0.003- 3****	0	0	0	0	0	0	0	-	0	0	0
SOIL, GROUND												
protected areas [mg/kg DM]	-	0.02	-	0.0025	0.0005	0.001	-	0.0025	-	0.0025	0.001	0.000005
agricultural lands, forests, residential, recreational areas [mg/kg DM]	-	0.02	-	0.025	0.005	0.01	-	0.025	-	0.025	0.01	0.0005
industrial and traffic areas [mg/kg DM]	-	2	-	0.25	0.5	0.1	-	0.25	-	0.25	0.1	0.005
SEDIMENTS												
concentration of substances contaminating the	-	≥ 0.3	-	-	-	-	-	-	-	-	-	-

Utilities or products	Maximum permissible concentration											
	HCBs	PCBs	PCDD/Fs	Aldrin	Dieldrin	Endrin	Chlordane	DDT	Heptachlor	Hexachlorocyclohexane (HCH)		
										α	β	γ
yield [mg/kg]												
FOOD												
grains [mg/kg]	0.01	-	-	0.01	0.01	0.01	0.02	0.05	0.01	Total 0.02		0.1
fat contained in meat, meat products, offal and animal fats [mg/kg]	0.2	-	-	0.2	0.2	0.05	0.05	1	0.2	0.2	0.1	0.7 for poultry meat 2 for other types
vegetables and fruit [mg/kg]	0.01	-	-	0.01 - 0.03 depending on the product	0.01 - 0.03 depending on the product	0.01	0.01 - 0.05	0.05 - 1	0.01 - 0.02	0.01 - 0.5		
fish meat and fishery products and their derivatives, with the exception of eel [pg/g fresh mass]			4.0									
			8.0									
* total of individual pesticides detected and quantified during the monitoring 0.5 µg/L												
** maximum value of concentrations												
*** arithmetic mean of concentrations from water samples in a calendar year												
**** maximum permissible daily average, depending on the type of production												

1.2. Tasks of public administration and public bodies

The Minister of Economy is responsible for creation of improved conditions and legal basis of economic development, including elimination of the negative impact of hazardous substances, including POPs. The Minister is responsible for activities related to the registration and labelling of equipment containing PCBs. Controlling body for the use of equipment containing POPs and the timing of their withdrawal from service is the **service of technical inspection**, acting in accordance with the Act of 21 December 2000 on technical inspection (Journal of Laws No. 122, item 1321, as amended).

The Minister of Health coordinates matters related to ensuring protection of human health, including the issue of POPs' impact on human health.

The National Health Programme 2007-2015, prepared by the Ministry of Health, for the operating objective no. 6 *Reduction of exposure to harmful factors in the working and living environment and their health effects and improvement of sanitary condition of the country* provides for measures to reduce environmental pollution and public health measures to reduce the population's exposure to harmful environmental hazards and reduce their impact on health.

Inspector for Chemical Substances and Preparations, reporting to the Minister of Health, gathers information on marketed chemical substances and preparations (except for pesticides and drugs) (produced and imported), makes the information on hazardous substances and preparations available to medical and rescue services, cooperates with international organizations for substances and preparations. These activities are conducted by the **Office for Chemical Substances and Preparations**, designated as the body to cooperate with the Member States, the European Commission, ECHA and as the National REACH Helpdesk Information Centre. The Office for Chemical Substances and Preparations is also responsible for the Good Laboratory Practice (GLP) in Poland.

The Chief Sanitary Inspector, reporting to the Minister of Health, whose task consists in exercising overall control of sanitary conditions in the country, including supervision of over food retail trade in terms of compliance with the rules concerning conditions of manufacturing, transport, storage and retail sales of food, as well as supervision over the health quality of products imported from abroad (with the exception of food of animal origin). The Chief Sanitary Inspector develops annual plans for monitoring and official control of food, including control of pesticide residues in food. The plan is sent to Province Sanitary Inspectors who are required to supervise the process of planning and delivery of tasks specified in the annual food sampling and testing plan for the province, and drawing up of relevant reports on plan implementation to the Chief Sanitary Inspectorate.

The national programme for testing of foods for pesticide residues combines the integrated monitoring of the European Union, the national monitoring and the planned official food control.

Coordination of environmental tasks is the responsibility of the **Minister of Environment** and comprises:

- shaping the principles of waste management,
- leading to reduction of contamination to individual elements of the environment,
- developing environmental quality standards,
- coordination of actions for the implementation of the best available techniques (BATs) and the best environmental practices (BEPs),

- determining the rules of environmental quality monitoring and of compliance with environmental protection regulations,
- representing Poland on the international forum in his areas of competence.

The Minister of Environment (in cooperation with other ministers) initiates and conducts legislative activities and supervises law enforcement in environmental protection. Control of execution of the decisions made is the responsibility of the **Chief Inspector of Environmental Protection**, reporting to the Minister of Environment, and **combined services reporting to voivodes - voivodship inspectorates of environmental protection**, under territorial combined government administration. The inspectorates' tasks include primarily control of compliance with the law and administrative decisions concerning the use of the environment (including inspection of industrial sites), operational control of systems and equipment protecting the environment from pollution, control of compliance with regulations on packaging materials and waste packaging materials, control of compliance with regulations on recycling of withdrawn vehicles and waste electric and electronic equipment, as well as monitoring and assessment of the environmental condition (under the National Environment Monitoring), including the transboundary shipments of waste and improvement of procedures and methods in this area, also applicable to POPs.

Financial support for environmental activities is provided by the **National Fund for Environmental Protection and Water Management** and provincial funds for environmental protection and water management, which fund the research and development activities, expert opinions and investment projects related to the reduction of POPs into the environment and disposal of POPs according to environmental protection requirements. **The State Council for Environmental Protection** plays an opinion-giving and advisory role.

The Minister of Agriculture and Rural Development is responsible for implementing the government's policy on agriculture (including plant protection products), keeps a register of plant protection products and issues marketing authorizations for such products in Poland.

The responsibilities of the **State Veterinary Inspection**, reporting to the Minister of Agriculture and Rural Development, include: supervision over safety of animal products, in particular: testing of slaughter animals and their meat, supervision on marketing of animals and animal by-products, monitoring of illicit substances, chemical and biological residues, residues of medicinal products and radioactive contaminations in animals, their secretions and excreta, tissues or organs, in animal products, in water for animals and in animal feed.

The Veterinary Inspectorate bodies supervise:

- slaughterhouses and cutting plants (meat of domestic hoofed animals, poultry, hares and rabbits, meat of farmed game animals),
- meat processing plants,
- game purchase centres and game processing plants,
- plants producing minced meat, raw meat products and mechanically separated meat (MSM),
- fish processing plants,
- milk collection points and dairy plants,
- egg plants,
- plants manufacturing, trading and using animal feeds.

The Veterinary Inspectorate bodies are:

- the Chief Veterinary Officer,

- provincial veterinary officers, as heads of the provincial veterinary inspectorates forming part of combined government administration in the province,
- district veterinary officers, as heads of the district veterinary inspectorates forming part of non-combined government administration,
- border veterinary officers.

Tasks of the Inspectorate's bodies are performed by veterinarians and other employees of the Inspectorate, as well as veterinarians appointed to perform specific duties, and non-veterinarians appointed to perform specific auxiliary duties.

The body competent in preparing and supervising delivery of the residues control plan is the Chief Veterinary Officer. The plan is being developed in cooperation with the **National Veterinary Research Institute** in Puławy. Residue control tests are performed in the Institute's Puławy facility and in eight veterinary hygiene institutions (in Białystok, Gdańsk, Katowice, Łódź, Olsztyn, Poznań, Warsaw and Wrocław) and sent to the Chief Veterinary Officer and the European Commission. The tests to determine the amount of residues of organochlorine pesticides such as: aldrin, dieldrin, DDT, endrin, heptachlor, hexachlorobenzene, hexachlorohexane (α -HCH, β -HCH and γ -HCH isomers) and methoxychlorine in feeds are carried out in seven Veterinary Hygiene Institutions, with the Institute of Plant Protection - National Research Institute in Poznań acting as the Reference Laboratory.

The Chief Veterinary Officer sets out the general lines of action of the Veterinary Inspectorate and issues instructions specifying the manner of its conduct, including instructions for application of the EU regulations by the Inspectorate, as well as reviews and assesses epizootic situation, safety of animal products and veterinary requirements for their production.

The Chief Inspector of Plant Health and Seed Inspection, reporting to the Minister of Agriculture and Rural Development, oversees and controls, among others, correctness of trade and use of plant protection products, and conducts research of plant protection product residues at the production stage in agricultural produce.

Official tests for plant protection product residues include:

- planned inspection - testing of agricultural produce samples according to the schedule developed by the Main Inspectorate of Plant Health and Seed Inspection,
- intervention inspection - testing of agricultural produce samples in cases of suspected use of plant protection products non-compliant with applicable legal regulations.

Tests for plant protection product residues are performed at the Central Laboratory of the Main Inspectorate of Plant Health and Seed Inspection in Toruń, Plant Protection Institute in Poznań and Research Institute of Pomology and Floriculture in Skierniewice.

Food safety in Poland is supervised, among others, by:

- The State Sanitary Inspectorate in terms of supervising health quality of foodstuffs of vegetable origin in production and supervising health quality of traded animal and vegetable foodstuffs,
- The Veterinary Inspectorate in terms of production of foods of animal origin,
- The Agricultural and Food Quality Inspection in terms of supervising quality of agricultural and food products in production and in trade, including ones exported abroad,
- The State Inspectorate of Plant Health and Seed Inspection in terms of correct application of plant protection products and monitoring of pesticide residues in agricultural products.

The Minister of Foreign Affairs coordinates international cooperation, including negotiating multilateral agreements, and is responsible for conducting their ratification procedures. He is also a political coordinator of GEF's operations in Poland.

The Minister of Finance is responsible for the state budget and supervises public finance and financial institutions.

The main tasks of **the Customs Service**, in addition to fiscal duties, include customs control of foreign trade and prevent smuggling and customs fraud. The Customs Service also exercises control over compliance with national and international regulations related to restrictions and prohibitions in foreign trade and over national customs policy instruments regulating the directions and volumes of foreign trade (e.g. monitoring implementation of tariff quotas).

Minister of Internal Affairs and Administration coordinates the actions taken by his subordinate units to improve safety. **Commander in Chief of the State Fire Service** supervises the activities of fire brigades in the control, exploratory, and rescue operations under the National Rescue and Fire Fighting System (including in the event of fire, accidents and accidents involving hazardous substances or waste).

The Minister of Infrastructure is responsible for the development of the municipal and transport sector, including the National Environmental Policy, and takes legislative initiatives aimed, for instance, at safe transportation of hazardous materials.

Chemicals transportation is supervised by **The Chief Road Transport Inspector**, reporting to the Minister of Infrastructure, and environmental protection, including waste management, is supervised by the Chief Environmental Protection Inspector.

The National Labour Inspectorate has been set up to supervise and control compliance with the labour law, in particular of occupational health and safety regulations and principles. Inspections apply to all employing establishments, including those using hazardous substances. The National Labour Inspectorate reports directly to the Sejm (lower house of the Parliament).

Supervision over commercial quality of products is exercised by the **Trade Inspectorate** reporting to the President of the Office of Competition and Consumer Protection.

Results of statistical surveys conducted and collected in the public statistics are made available by the **Central Statistical Office**. Data on environmental protection have been published since 1972 in the form of annual publications of the CSO's *Protecting the environment* series (these figures do not include all the POPs covered by the Convention).

2. TO-DATE ACTIVITIES IMPLEMENTING THE STOCKHOLM CONVENTION

2.1. Substances covered by the Convention

Article 3 of the Convention sets out the following requirements to the Parties thereto:

- to eliminate from production and use, import and export of substances listed in Annex A (except for importing or exporting with the aim of safe disposal),
- to reduce production and use of substances listed in Annex B.

Annexes A *Elimination* and B *Restriction* to the Convention set out detailed exemptions from the production or use prohibition for substances listed therein. Responsibilities of the Parties to the Convention that use these exemptions are set out in Article 3 item 2 and Article 4 of the Convention.

Annex C *Unintentional Production* to the Convention lists persistent organic pollutants generated as by-products of specific processes. Responsibilities of the Parties to the Convention in relation to "unintentional production" are defined in Article 5 of the Convention.

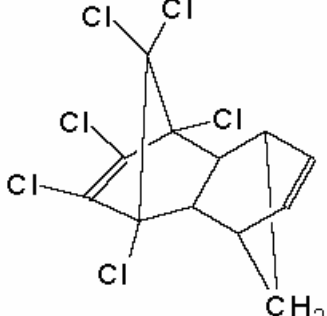
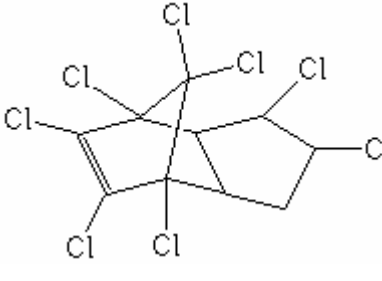
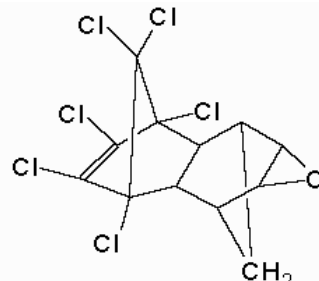
Article 6 of the Convention sets out measures to reduce or eliminate releases from POPs-containing stocks and waste, including recommendations for waste management.

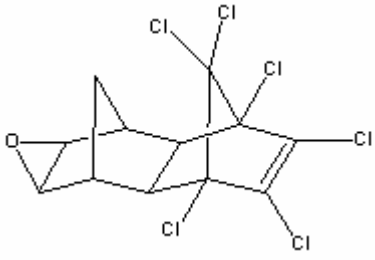
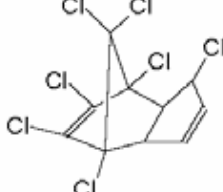
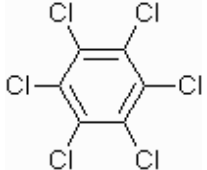
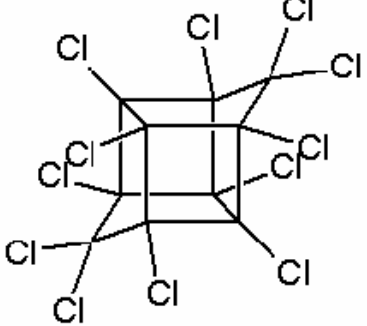
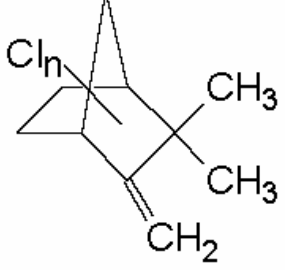
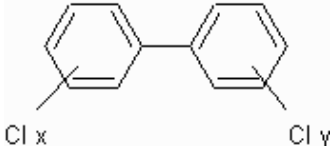
2.1.1. Releases from intentional production

2.1.1.1. Substances listed in Annex A

Annex A to the Convention lists chemicals covered by the production and use prohibition. This list, according to Article 21 of the Convention, may be extended by new substances upon decision of the Conference of the Parties. The list of these substances is presented in Table III.

Table III. Substances covered by Annex A to the Convention.

Name of substance	CAS No	Structural formula
<p>Aldrin 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4-endo-5,8-dimethanonaphthalene</p>	309-00-2	
<p>Chlordane 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane</p>	57-74-9	
<p>Dieldrin 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8exo-dimethanonaphthalen</p>	60-57-1	

Name of substance	CAS No	Structural formula
Endrin 1,2,3,4,10,10-hexachloro-6,7-epoxy- 1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-5,8-endo- dimethanonaphthalen	72-20-8	
Heptachlor 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7- methanoindene	72-44-8	
Hexachlorobenzene (HCB) 1,2,3,4,5,6-hexachlorobenzene	118-74-1	
Mirex dodecachloropentacyclo[5.2.1.0 ^{2,6} .0 ^{3,9} .0 ^{5,8}]decane	2385-85-5	
Toxaphene	8001-35-2	
Polychlorinated biphenyls (PCBs)	More than 200 chemical compounds	

As at 30 June 2010, Annex A contains, except for PCBs, substances with pesticidal, fungicidal and acaricidal properties.

At present, none of the substances listed in Annex A is manufactured in, imported to or exported from Poland (except for waste containing them, transported abroad for disposal). Also no special exemptions for substances listed in Annex A are applicable in Poland.

2.1.1.2. Substances listed in Annex B

As at 30 June 2010, Annex B lists one substance - DDT (1,1,1-trichloro-2,2-bis(chlorophenyl)ethane, CAS No 50-29-3. DDT is not manufactured or used in Poland at the moment, therefore Poland does not use any special exemptions for this substance specified in Annex B.

2.1.2. Releases from unintentional production

As at 30 June 2010, Annex C listed the following as as unintended products covered by the requirements of the Convention:

- Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDDs/PCDFs)
- hexachlorobenzene (HCB),
- polychlorinated biphenyls (PCBs).

Persistent organic pollutants are produced as by-products in various anthropogenic processes - primarily in industrial or household combustion processes, in metallurgy (ore roasting and secondary production of metals), chemical industry (halogen compounds chemistry) or during waste incineration. POPs may occur as pollutants in waste gases from processes, in waste water, as well as in the main product - in every place where halogen and organic compounds are found in raw materials and the process is conducted in higher temperatures.

Article 5 of the Convention obliges the Parties to take measures to reduce or eliminate releases of chemicals listed in Annex C from anthropogenic sources. Action plan in this area should be incorporated into the National Plan for Implementation of the Stockholm Convention (Article 7).

In order to identify the sources of persistent organic pollutant substances generated as products of unintentional production, the *Inventory of Dioxin and Furans Releases in Poland* [5] has been delivered in 2002, which:

- located the plants covered by the guidelines of the *Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases*,
- defined the levels of emission factors typical of Polish production facilities,
- estimated emissions from these plants,
- determined the activity of individual plants.

The obtained results were used to estimate PCDD/F, HCB and PCB releases and emissions into the environment for the purposes of the *National Plan for Implementation of the Stockholm Convention*.

In 2002, also the *National strategy to protect the environment from persistent organic pollutants*, adopted by the Council of Ministers, was developed which discussed the key lines of action to reduce emissions of persistent organic pollutants. It was updated in 2006 to make provision for the approach outlined in the *Community Strategy for dioxins, furans and polychlorinated biphenyls* of 2001.

Actions have also been taken to determine the type of sources of persistent organic pollutant substances generated as products of unintentional production: on an annual basis, the National Administrator of the Emissions Trading Scheme - the National Centre for Emission Balancing and Management (KASHUE-KOBiZE) takes up an inventory of emissions of persistent organic pollutant substances (the inventory covers PCDD/Fs, HCBs, PCBs) into the air.

In terms of reducing emissions of POPs generated as unintentional products, the *Inventory of Dioxin and Furans Releases in Poland* [5] identified emission reduction measures divided into measures reducing generation of dioxins and furans and measures determinant for reduction of their releases to the environment.

Recent years have also seen the following measures to reduce POP emissions:

- legal regulations have been introduced for an integrated pollution prevention and control (IPPC), dioxin and furan emission standards have been adopted for plants incinerating or co-incinerating waste, and the use of the best available techniques (BATs) has been recommended, in particular for plants carrying out processes leading to POP releases,
- increasingly efficient systems for reducing emissions of air pollutants (increasingly effective sorption systems of exhaust gases treatment) are being implemented,
- combustion processes, in particular in individual furnaces, undergo gradual modernization and treatment of exhaust gases from coal-fired boiler houses is improving, with small, high-efficiency oil- or gas-fired boiler houses being built,
- communes and districts implement programmes to reduce low emissions, consisting in reduction of emissions of hazardous substances into the atmosphere by comprehensive elimination of existing, inefficient heating sources and introducing environmentally friendly, energy-efficient heating devices.

Pursuant to the Environmental Protection Law, government and local government bodies should incorporate the environmental protection and sustainable development principles into their strategies, plans, policies and programmes (Article 8). Therefore, executive bodies of province, district and commune administration draw up, respectively, regional, district and communal environmental protection programmes to implement the national environmental policy (Article 17). In addition to this, the province government draws up air protection programmes (Article 91) having the force of a local law, providing for a manner of ensuring the best possible air quality by:

- maintaining air pollutant levels below or, as a minimum, at the permissible levels,
- reducing air pollutant levels to, as a minimum, permissible levels, if they are not complied with (Article 85).

A particularly important task, as indicated in the Act, should be the application of the best available techniques (BATs) in the case of plants being new sources of emissions, especially of the substances listed in Annex C. The introduction of BATs in these sources of emissions should take place as soon as possible, no later than 4 years from the date the Convention enters into force for that Party (Article 5 d), that is until 21 January 2013 in Poland's case. Another important task is also the recommendation to use the best environmental practices (BEPs).

According to the information of the Chief Inspector of Environmental Protection [6] on the state of formal legal regulation of integrated permissions by establishments running plants subject to this obligation as at 31 December 2009 there were 3152 IPPC plants identified in the country, of which 8 were out of service due to the lack of an integrated permission, and for 42 the regional environmental protection inspectors have issued decisions prohibiting their use. Therefore, there were 3102 operated plants, of which 3065 had the integrated permissions. As per the remaining 36 plants, proceedings in administrative courts or in bodies competent to grant a permission are still pending, and 1 plant obtained the permission in January 2010.

The list of plants covered by Regulation (EC) No 166/2006 includes all plants requiring an integrated permission and additionally the following types of activities:

- coal pulverizers with capacity of more than 1 tonne/hour,
- plants manufacturing coal products and solid smokeless fuel,
- underground mining and related activities,
- surface mining and quarries with area of actual excavation activity exceeding 25 hectares,
- municipal waste water treatment plants serving more than 100,000 pe,
- independently operated effluent treatment plants which serve one or more activities listed in Annex I to Regulation (EC) No 166/2006, with a capacity exceeding 10,000 m³ per day.
- Industrial sites, equipped with plants releasing POPs into the environment, are obliged to control volumes of such releases and send this information to the National Pollutant Release and Transfer Register run by the Chief Inspectorate for Environmental Protection.

In 2006, Poland provided the European Commission with data on emissions for 2004 from facilities covered by the IPPC Directive and reporting under the EPER. They are available at the Community website about EPER¹. In order to collect these data, sources and volumes of emissions have been identified, including emissions of PCDD/Fs and HCB into the air.

The total emission of **dioxins and furans** in 2007 was 395.5 g, and in 2008 - 399 g. Shares of individual types of emission sources are presented in Figure I.

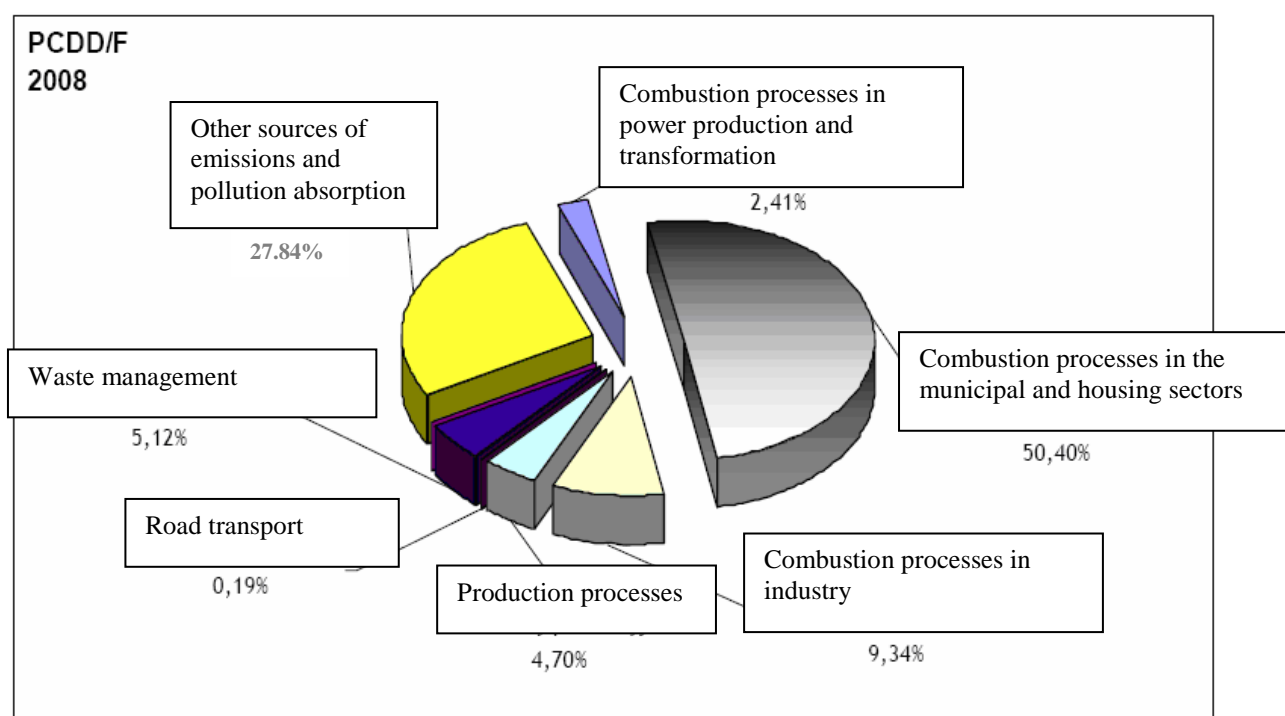


Fig. I. PCDD/F emissions into the air in 2008 [7]

Municipal and housing sector has a dominant share in PCDD/F emissions as the main fuel used in this sector is hard coal (annual consumption of 9 million tonnes). With household furnace emissions at the rate of 18mg TEQ PCDD/F/Gg of carbon, this is equivalent to emission of 162g TEQ i.e. 50.4% share in total volume released into the air countrywide.

Also other emission and pollution absorption sources have a significant share, e.g. fires of landfills, buildings or cars, as well as forests, or smoking cigarettes.

¹ <http://eper.ec.europa.eu/eper>

HCB emissions in 2008 are estimated at 9.73 kg. Shares of individual sources of this emission are presented in Figure II.

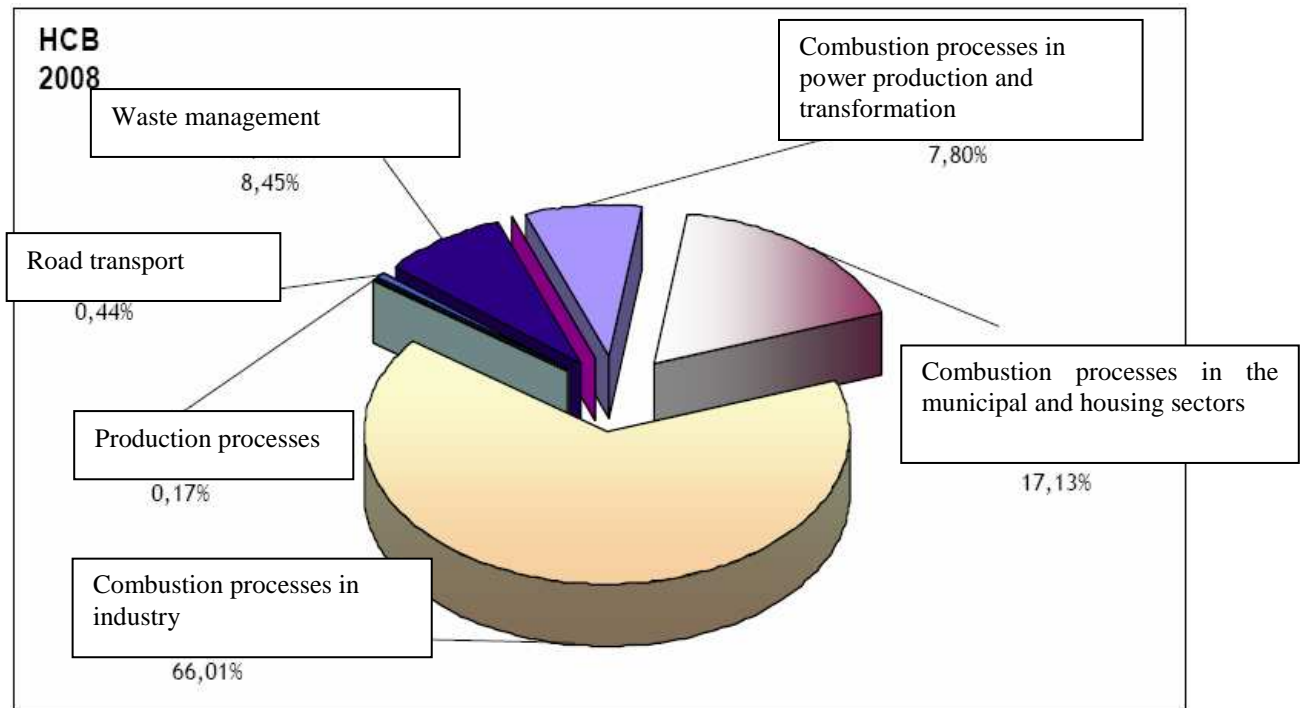


Fig. II. HCB emissions into the air in 2008 [7]

In HCB emission, industrial processes, mainly of metal ore roasting and secondary copper smelting, play the dominant role. Also household furnaces fired with hard coal are a major source of emissions.

PCB emissions in 2008 are estimated at 668.15 kg. Shares of individual sources of this emission are presented in Figure III.

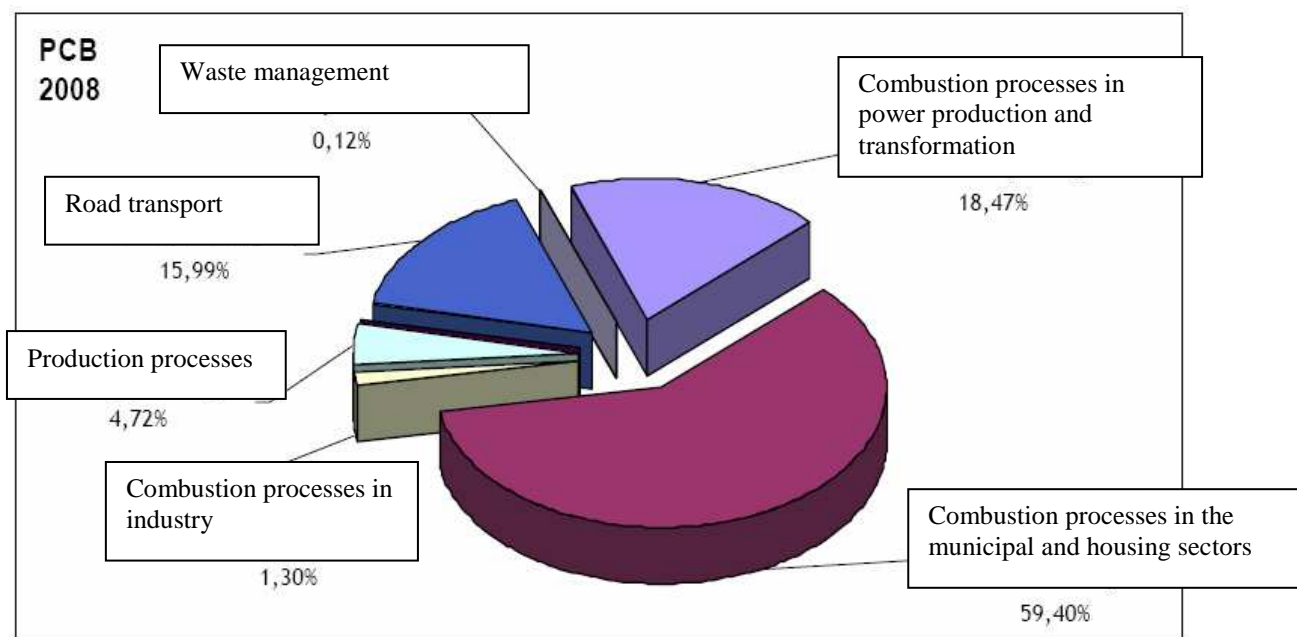


Fig. III. PCB emissions into the air in 2008 [7]

As in the case of PCDD/F emissions, the municipal and housing sector is the main source of emissions. Also in this case, fuels used in household furnaces, mainly hard coal, are the main source. These issues are regulated by the Act of 10 April 1997 - the Energy Law (Journal Laws of 2006 No. 89, item 625, as amended), while the direction of the changes is set by the Notice of the Minister of Economy of 21 December 2009 on the state energy policy until 2030, Annex *Polish Energy Policy until 2030*.

Also emissions from the power generation and transformation sector have a major share in PCB release into the environment. In 2010, following the withdrawal of PCBs from use, it is anticipated that the release volume of this substance will drop significantly.

It should be noted that in assessment of emission volumes from individual sources emission volume factors are used that require continuous updating due to technological changes and fuel quality improvements. Also estimates as to frequency of incidents (e.g. the number of waste landfill fires and the release volumes adopted for such incidents) or estimates of releases from electric appliances (capacitors) may raise some doubts. In spite of this, emissions from household furnaces in total emissions of all pollutants listed in Annex C to the Convention still undisputedly have the dominant share.

The main source of dioxin emissions into the air from fuel combustion processes is the housing sector using individual furnaces and heating boilers fired with coal fuels and biomass and using kitchen furnaces fired with such fuels to prepare meals and drinking water. The problem of PCDD/F emissions from this sources is important not only due to their share in total dioxins and furans emissions in Poland (over 36%) but also due to the generally inadequate waste incineration and co-incineration conditions in furnaces and ovens.

Apart from this sector, the largest PCDD/F emissions into the air can be found in metallurgical processes, in particular during iron ore roasting and oxygen conversion of steel, and in secondary aluminium production. The last process uses substances particularly strongly affecting PCDD/F emissions.

Minimal emissions of PCDD/Fs, HCB and PCBs in Polish total emissions are generated in the regeneration of gasoline conversion catalysts in the refinery industry.

Professional and industrial power generation is subject to special control of environmental protection regulations requiring the use of protective equipment, and in particular dust

removal and flue gas desulphurisation processes which largely eliminates PCDD/F releases into the air.

Releases into residues (fly ash) have not been inventoried to date. In this case, however, no protective equipment can be used nor these releases reduced as combustion processes are conducted in optimum conditions.

2.1.3. Releases from stored stocks and waste

There are no stockpiles of POP-containing products in Poland. Measures taken in Poland to withdraw and dispose of the existing waste materials containing POPs - these are the plant protection products withdrawn from use and PCB-containing oils in electrical equipment - according to the Act of 27 July 2001 introducing the Environmental Protection Law act, the act on waste and amending certain acts (Journal of Laws No. 100, item 1085, as amended), planning documents e.g. the *National Waste Management Plan 2010* and the *National Environmental Policy in 2009-2012 with a view to 2016*, should lead to their disposal in 2010 and are not discussed in this document.

Industrial wastes containing POPs can be found on the landfill of Organika-Azot site in Jaworzno (the Śląskie province) and on grounds owned by the town of Jaworzno. This site has in the past been producing DDT and plant protection products containing imported POPs. "Rudna Góra" Central Waste Landfill includes land of the "Organika-Azot" S.A. site.

The Organika-Azot site in the years 1947-1980 has produced 78 950 Mg of DDT. There is no data on the quantities of plant protection products manufactured using other POPs. It is estimated that the amounts of POPs stored at the landfill (based on maximum permissible losses in the process - 2%) could reach $78,950 \times 0.02 = 1,600$ Mg of DDT metabolites and 20 Mg of HCB. It is assumed that the landfill stores about 15.5 to 27.5 Mg of POPs, but actually all the landfilled waste there must be regarded as containing POPs [8]. On the remaining land, owned by the town of Jaworzno, approximately 33,600 Mg of inactive HCH isomers are deposited.

Since 2009, the water from excavation draining and refluxes from the landfill has been pumped to the site mechanical and chemical effluent treatment plant and only following treatment it is discharged into the Wąwolnica stream. Analyses have shown presence of p,p'-DDT (7-12 µg/l), o,p'-DDT (0.95-9.2 µg/l), DDD (4-11 µg/l), as well as HCH isomers (570-821 µg/l), tetradifon (5,6-9,0 µg/l) and free cyanides (0.1-0.55 µg/l) in the untreated refluxes. The site mechanical and chemical effluent treatment plant was upgraded in 2003-2004. Currently the treatment process is complemented by coagulation with flocculation, filtration with gravel filters and carbon adsorbers. Sewage sludge is dewatered in the filter press.

The content and condition of the landfill makes it a most serious risk, and the contamination of groundwater and surface waters in the landfill's, and in fact the entire Site's, vicinity proves progressive releases of POPs into the environment. High probability of PCDD/F-contaminated waste presence requires top priority measures in order to [8]:

- shut off the access of rain water and groundwater to the landfilled waste, also in these Site areas where high soil contamination has been found,
- commission bio- and phytoremediation plants to reduce the POP penetration,
- start monitoring of water quality in the neighbouring water uptakes.

Measures completed by 2009 - installation of drainage, girding ditch, and treatment of landfill refluxes - help prevent POP releases from the landfill, but do not eliminate this situation adequately which is shown by periodic presence of pollutants in the Wąwolnica stream.

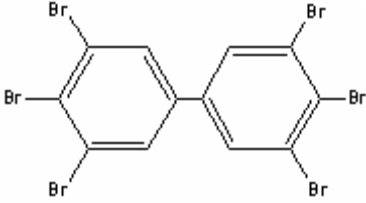
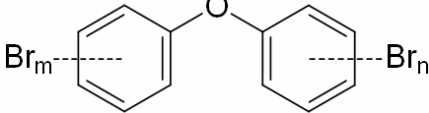
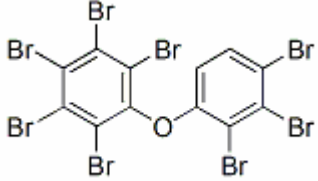
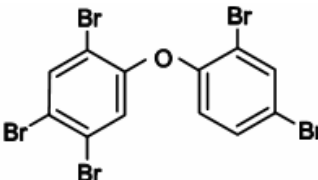
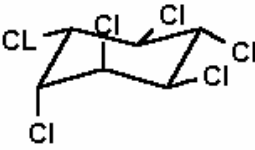
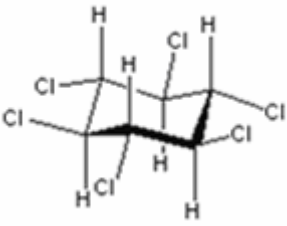
In this situation, a solution eliminating (irreversible conversion of) waste cannot be proposed due to the high risk related to processing of the entire landfilled waste mass and huge costs.

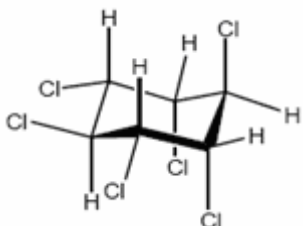
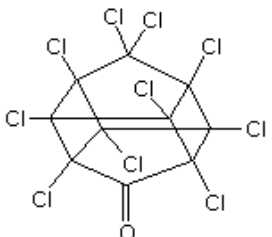
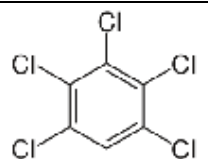

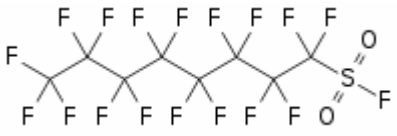
The recommended solution is to prevent further penetration of groundwater and rain water into the mass of the landfilled waste and to treat all refluxes from the landfill or its vicinity where POPs have been found in amounts and types indicating their landfill origin. Tasks in this area are defined in the *Environmental Protection Programme for the Śląskie Province until 2013 with a perspective to 2018* and in the *Waste Management Plan for the Śląskie Province* and in the *Waste Management Plan for Jaworzno township for 2008-2011 with a perspective to 2012-2018*.

2.1.4. Substances covered by the Convention at the 4th Conference of the Parties

The 4th Conference of the Parties of the Stockholm Convention, held in Geneva on 4-8 May 2009 decided to list new substances in the annexes to the Convention (Table IV).

Table IV. New substances covered by the provisions of the Convention by the 4th Conference of the Parties

No.	Substance	CAS No	Structural formula	Annex to the Convention
1	Hexabromobiphenyl (HBB)	36355-01-8		A
2	Hexabromodiphenyl ether Heptabromodiphenyl ether	–		A
3	Octabromodiphenyl ether (C-octa BDE)	32536-52-0		A
4	Pentabromodiphenyl ether (C-penta BDE)	32534-81-9		A
5	α -hexachlorocyclohexane	319-84-6		A
6	β -hexachlorocyclohexane	319-85-7		A

No.	Substance	CAS No	Structural formula	Annex to the Convention
7	γ -hexachlorocyclohexane	58-89-9		A with exemptions
8	Chlordecone	145-50-0		A
9	Pentachlorobenzene (PeCB)	608-93-5		A and C
10	Perfluorooctanesulfonic acid (PFOS) and its salts	1763-23-1		B with exemptions
11	Perfluorooctane sulfonyl fluoride (PFOSF)	307-35-7		B with exemptions
<p>* CAS number for the group of polybrominated biphenyls ** CAS number for racemate *** CAS number for parent perfluorooctanesulfonic acid</p>				

Amendments to the Convention will take effect from 26 August 2010. As a result, this Plan will be updated within 2 years of the entry of these amendments into force.

2.2. Sharing information

Poland (including, among others, the Ministry of Environment as the *contact point* and the Institute of Environmental Protection as the *focal point*) shares information with the Secretariat of the Convention and the European Union, by sending opinions to the documents, Poland's positions and any data or information needed in day-to-day operations of the competent authorities for the Convention. Whenever possible Poland also shares information with non-EU countries.

In addition, Poland takes part in discussion meetings of the European Council and European Commission bodies and working groups on issues covered by the Convention.

2.3. Public information, social awareness and education

Public information on persistent organic pollutants plays, at a basic level, an educational role for the public. Promoting information on POP-related issues and on progress of this plan implementation is the responsibility of the Environmental Information Centre (CIOŚ). The Centre, as the source of information sharing information on POPs is actively propagating them among the decision-makers and the public.

Currently, raising public awareness is facilitated by, among others:

- Running information sections on websites of the Ministry of Environment (www.mos.gov.pl) and Environmental Protection Institute (<http://ks.ios.edu.pl/> and www.kashue.pl). Specialist websites are aimed at informing employees of local and government administration of the current legislation and practice in assessing the hazard of the release of POPs into the environment. There are also websites on waste handling (e.g. <http://odpady.net.pl>), dioxins (e.g. <http://www.dioksyny.eu/>) and PCB (e.g. www.pcb.pl).
- Publications and information materials on persistent organic pollutants, such as: *Persistent organic pollutants in the environment. Regulation No 850/2004 of the European community*, *Persistent organic pollutants - waste management*, *Persistent organic pollutants in the environment. Low emission* (available on websites of the Ministry of the Environment and Environmental Protection Institute <http://ks.ios.edu.pl/>).
- Materials on inventory of POP emissions into the air, available at www.kashue.pl.
- Holding conferences, also the annual international Conference on *Dioxins in the industry and environment* held by EMIPRO sp. z o.o. and Trace Analysis Laboratory of the Cracow University of Technology.
- Participation of employees of ministries, inspectorates, local government administration and institutes in meetings and conferences on waste and POPs,
- Training for employees of ministries and institutes on POPs.
- Distribution of information leaflets and brochures (e.g. on proper PCB handling) by non-governmental environmental organizations.
- Involving representatives of the industry in discussions on preparation of Poland's positions for meetings of the European Council and European Commissions bodies and of working groups.

2.4. Research and development works and monitoring

2.4.1. Research and development works

The Environmental Protection Institute which runs an information sharing point (*focal point*) for matters related to the Convention has since 2003 been analysing the tasks under the Convention. The Institute also comprises KASHUE-KOBiZE - the National Administrator of the Emissions Trading Scheme - the National Centre for Emission Balancing and Management which carries out, among others, inventory of pollutant emissions, including POPs, into the air.

The Polish Geological Institute in Warsaw conducts works to inventory POPs in soil and ground waters and has inventoried POP-containing waste plant protection products (waste repositories) withdrawn from use.

The Institute for Ecology of Industrial Areas in Katowice is conducting research on POP releases into the environment, and the **Maritime Branch of the Institute of Meteorology**

and Water Management tests POP concentrations in river waters, bottoms and aquatic organisms.

The National Institute of Hygiene in Warsaw, reporting to the Minister of Health, conducts research on human exposure to environmental POP levels and risk assessment, and gives opinions to the Ministry of Health on POP impact on humans; the Institute of Occupational Medicine in Łódź and the Institute of Occupational Medicine and Environmental Health in Sosnowiec conduct research on hazards from environmental pollution to human health, in particular in industrial areas.

The Central Institute for Labour Protection is responsible conducting research on the impact of harmful factors, including POPs, on people in their workplace.

The Industrial Chemistry Research Institute conducts research and development works in the field of process safety in the chemical industry, emissions of POPs and POPs content in products.

The Institute of Industrial Organic Chemistry conducts research and development on the synthesis of plant protection products, chemical safety, transport of hazardous materials and chemical plant protection products.

The National Veterinary Institute - National Research Institute in Puławy conducts scientific research on health protection and preventing infectious animal diseases, including zoonoses as well as hygiene and toxicology of food of animal origin and animal feeds. With regard to recent issues, it analyses POP abundance through monitoring and analytical research, carries out risk assessments and provides advice and expertise to the Ministry of Agriculture.

The Institute of Plant Protection conducts research and development works on the use of plant protection products. The Sośnicowice Branch of the Institute of Plant Protection conducts research and development works on elimination of plant protection product residues (including waste repositories).

The Institute for Ferrous Metallurgy deals with the methodology of research and elimination technologies for waste generated in the metallurgical industry and conducts research on hazardous substances emissions generated during processing and combustion processes in ferrous metallurgy.

The Institute of Non-Ferrous Metals conducts research on emissions of hazardous substances, including POPs, from manufacture and processing of non-ferrous metals.

Trace Analysis Laboratory of the **Cracow University of Technology** determines, pursuant is in the accreditation granted by the PCA, the levels of: dioxins and furans - PCDD/Fs, polychlorinated biphenyls - PCBs, including 12 dioxin-like dl-PCBs (WHO-PCBs), polybrominated diphenyl ethers (PBDEs) and other brominated flame retardants, organochlorine pesticides, PAHs in food and feeds, the environment and technical products, as well as dioxins and PCBs in food products, processed foods, animal feeds and technical products.

2.4.2. Monitoring results

Currently, the data on levels of persistent organic pollutant substances covered by the Convention in individual environment components are gathered by various institutions such as:

- Chief Inspectorate for Environmental Protection (GIOŚ),
- voivodship inspectorates for environmental protection (WIOŚ),
- The Institute of Environmental Protection in Warsaw (IOŚ) - the National Administrator of the Emissions Trading Scheme - National Centre for Emissions Balancing and Management (KASHUE-KOBIZE),

- Polish Geological Institute - National Research Institute (PIG-PIB),
- the Institute of Meteorology and Water Management (IMGW),
- the State Veterinary Inspection (PIW),
- the National Veterinary Institute - National Research Institute (PIWet-PIB)
- the State Sanitary Inspection (PIS)
- the Agricultural and Food Quality Inspection (IJHARS),
- the Main Inspectorate of Plant Health and Seed Inspection (PIORiN).

Air measurement results obtained under the National Environmental Monitoring and by other participants of the air quality assessment system, are gathered regularly in provincial databases run by voivodship inspectorates and sent from time to time to the national JPOAT database at the server of the Chief Inspectorate of Environmental Protection.

For monitoring quality of Poland's flowing waters, all voivodship environmental protection inspectorates and the GIOŚ run two databases to collect, verify and process results of water quality tests (JAWO and AQUA databases). These two databases do not ensure complete data collection. GIOŚ is currently working on a database for waters within the Ekoinfonet database.

The public OSADY website supervised by the Chief Inspector of Environmental Protection and featured on his website presents publicly available data on tests of river and lake water alluvia performed by Polish Geological Institute under the National Environmental Monitoring subsystem "Monitoring quality of inland surface waters".

CELAB database - a national system allowing collection and management of data on lab test results conducted as a part of duties of the Veterinary Inspectorate's bodies - gathers data including information on samples, sampling methods and sites and the conducted laboratory tests. The data are recorded in the Central Database located at the National Veterinary Institute - National Research Institute in Puławy. The system collects data from sixteen Veterinary Hygiene Institutions, their branches, independent labs, private laboratories approved by the Chief Veterinary Officer and from laboratories of PIW-PIB in Puławy which is the system administrator. The system became operational as of 1 January 2007 however the data on tests have not yet been fully entered into the system. Access to the data stored in the Central Database through a web application is limited to registered users from laboratories of veterinary hygiene institutions and PIW-PIB in Puławy, authorised staff of the Veterinary Inspectorate's bodies and authorised staff of the Ministry of Agriculture and Rural Development.

The National Plan for Implementation of the Stockholm Convention additionally presents data on abundance of polycyclic aromatic hydrocarbons (PAHs) and HCH isomers in individual environment components. Although these substances are not listed in annexes to the Convention, they are subject to monitoring pursuant to Regulation (EC) No 850/2004.

2.4.2.1. Air

Monitoring and assessment of air quality are carried out under the National Environmental Monitoring in the *Air quality monitoring* subsystem. Testing and assessment of the level of substances in the air are the responsibilities of voivodship environmental protection inspectors. The basic level for delivery of this task is the province covering a number of zones. The list of measurement stations participating in the system, scope of measurements for individual stations and scope of other complementary tests are defined by the voivodship environmental protection inspector in consultation with units operating the measurement stations - as a part of voivodship environmental monitoring programmes based on results of preliminary assessment of air quality in the zones. Apart from the obligatory measurement programme covering substances for which permissible levels, target levels and long-term

target levels have been defined, and substances covered by special programmes, the voivodship environmental protection inspector may include other substances in the voivodship environmental monitoring programme taking into consideration specific pollution sources located in the province. In such cases, studies are locally based and their results are not used in the classification of zones.

Based on the test results, voivodship environmental protection inspectorates carry out annual assessments of air quality in the provinces. After the results are submitted to the Chief Inspectorate, a comprehensive assessment of air quality in Poland is being developed.

Of POP substances, only benzo(a)pyrene (B(a)P) is monitored as a representative of the polycyclic aromatic hydrocarbons (PAHs) for which the Regulation of the Minister of Environment of 3 March 2008 on levels of certain substances in the air (Journal of Laws No. 47, item 281), hereinafter the "Regulation on the levels of certain substances in the air", specifies the target level in the air, for the protection of human health, the 1 ng/m^3 (the total content in PM10 particulate matter).

Air monitoring system in 2007 consisted of a total of 1223 measurement points, and in 2008 of 3492 measurement points [9, 10]. Also results of tests performed by the State Sanitary Inspection, in particular in PM10 particulate matter measurements, as well as by businesses, research and development institutions, foundations and local government units were used in air quality assessment.

The 2007 assessment has been performed in the new layout of zones in the country. As of 2008, the annual air quality assessment has been extended to include also benzo(a)pyrene in PM10.

Monitoring of benzo(a)pyrene in PM10 was started in 2007. Moreover, since 2008 a number of polycyclic aromatic hydrocarbons: benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene and dibenzo(a,h)anthracene in PM10, have been monitored in selected urban stations.

Average annual concentrations were calculated in 2007 for 26 sites, and in 2008 for 36. B(a)P content in PM10 was determined in daily samples (daily or cyclic measurements) or in samples appropriate for a longer period of content averaging (weekly, fortnightly, monthly).

In most sites (24 of 29 included in the 2007 analysis and 33 of 36 included in the 2008 analysis), average annual concentrations of B(a)P exceeded the target level of 1 ng/m^3 . In 2008, like in the previous year, benzo(a)pyrene's normative value was exceeded in the largest number of sites (of all included in the assessment) countrywide.

Benzo(a)pyrene shows a marked seasonal variation of concentrations - daily B(a)P concentrations in the heating season were frequently much higher than in other times of the year. Permissible average annual concentration (target level) were nearly always exceeded due to increased concentrations in the winter period.

The most frequently quoted reason for exceeding the target concentration values were impact of emissions related to individual heating of buildings (69% of sites where the target level was exceeded), and to a much smaller extent: impact of emissions related to vehicle traffic in the city centres with intense traffic, and adverse weather conditions in the analysed period. The target level for B(a)P concentration in the air is very tight, anyway, and difficult to achieve not only in Polish conditions.

2.4.2.2. Waters

2.4.2.2.1. River and lake waters

River and lake waters are tested under the National Environmental Monitoring in the *Monitoring of inland surface waters* subsystem. In 2008, the work related to implementation of a new water condition monitoring and assessment system were continued; the network of control measurement sites for surface water monitoring has been verified. POP substances are tested in homogenous sections of rivers and lakes² in the network of diagnostic, operating and research monitoring sites.

Overall in 2008, voivodship environmental protection inspectorates tested 1689 control measurement sites in the river water quality monitoring network and 226 control measurement sites in lakes.

As a part of chemical monitoring, tests for substances particularly harmful for the lake aquatic environment were started in 2008 (priority substances, specific synthetic and non-synthetic pollutants).

As a part of the monitoring, the following persistent organic pollutant substances are tested: aldrin, endrin, dieldrin, γ -HCH, total DDT and p, p'-DDT, p, p'-DDE, p, p'-DDD, endosulfan I and endosulfan II, HCB, total PCBs, PAHs. The available monitoring data include only the measurement points located in rivers.

Of the tested organochlorine pesticides, the largest concentrations in 2008 were noted for γ -HCH – average γ -HCH concentration in waters of individual Regional Water Management Boards amounted from 0.001 to 0.01 $\mu\text{g/l}$.

Average concentration of **total DDT** in waters of individual Regional Water Management Boards was from below the detection threshold in the Gdańsk and Gliwice regions to 0.006 $\mu\text{g/l}$ in the Wrocław region.

Waters managed by Gliwice Regional Water Management Board had an average aldrin concentration of 0.612 $\mu\text{g/l}$. In other Regional Board regions, average aldrin concentrations did not exceed 0.003 $\mu\text{g/l}$.

Average concentrations of **dieldrin** in waters did not exceed 0.001 $\mu\text{g/l}$.

Average concentration of **endosulfan** was highest in the Poznań region (0.005 $\mu\text{g/l}$), while in other regions it did not exceed 0.003 $\mu\text{g/l}$.

2.4.2.2.2. The Baltic Sea waters

Regular testing the Baltic marine environment have been carried out since 1979, and since 1991 under the National Environmental Monitoring. Since 1998, the measurement programme has been implemented according to HELCOM's recommendations as an integrated COMBINE Baltic Monitoring Programme. The obtained test results are compiled in the oceanographic database and then submitted regularly to HELCOM's data bank.

They include monitoring of the deep water zone (7 research stations in the area of the Gotland Basin, Bornholm Deep and Gdańsk Deep) and a complementary testing programme for the coastal zone, bays and lagoons (17 research stations in the area of Gdańsk and Pomorska Bays, Vistula and Szczecin Lagoons). The programme also includes determinations of the levels of persistent organic pollutants such as aldrin, dieldrin, DDT and other.

² Homogenous water sections - separate entities for which analyses of anthropogenic pressures are conducted and water and environmental programmes are being developed

Also Baltic Sea shallow water zone is monitored by voivodship environmental protection inspectorates in Szczecin, Gdańsk and Olsztyn under Measure *Tests and assessment of transitional and coastal waters*, resulting from implementation of Directive 2000/60/EC of the European Parliament and the Council of 23 October 2000 establishing a framework for the Community action in the field of water policy (Official Journal EC L 327, 22.12.2000, p. 1; Official Journal EU Special edition in Polish Chapter 15, vol. 5, p. 275), comprising:

- transitional water monitoring (31 control measurement sites);
- monitoring of coastal waters in the zone of up to one nautical mile (15 control measurement sites).

Tests for POP substances in the Vistula Lagoon waters (transitional waters) under the National Environmental Monitoring were started in 2008 [11]. Water samples were taken from 9 measurement sites. The scope of water quality testing in the Vistula Lagoon for POP substances included: the sum of aldrin, dieldrin, endrin (and isodrin), total DDT and p,p'-DDT, benzo(a)pyrene, the sum of benzo(b)fluoranthene and benzo(k)fluoranthene, the amount of benzo(g,h,i)terylene and indeno(1,2,3-cd)pyrene.

Average concentrations of **p,p'-DDT** and total **DDT** were 0.0008 and 0.001 µg/l, respectively.

No sum of **aldrin**, **dieldrin** and **endrin** were found in the samples taken.

The maximum concentration of **benzo(a)pyrene** was 0.005 µg/l. No sum of **benzo(b)fluoranthene** and **benzo(k)fluoranthene**, nor sum of **benzo(g,h,i)terylene** and **indeno(1,2,3-cd)pyrene** have been found.

Tests of transitional waters (incl. the Szczecin Lagoon) and coastal waters in the Zachodniopomorskie province carried out as a part of diagnostic monitoring in 18 sites (6 sites in coastal and 12 sites in transitional waters) in 2008 did not include any POP substances [12].

2.4.2.3. Bottom sediments

Tests of bottom sediments of rivers and lakes in Poland, carried out under the National Environmental Monitoring since 1990, are aimed at observation of the contents of persistent organic pollutants (PAHs, PCBs, organochlorine pesticides) in sediments formed today in the rivers and lakes, as well as observation of their changes over time. Tests of river and lake water sediments are performed under the *Monitoring quality of surface waters* subsystem by Polish Geological Institute - National Research Institute. Direct supervision over the testing programme delivery is ensured by the Chief Inspectorate for Environmental Protection. Due to the changes in monitoring which occurred between 2005 and 2009, it is not possible to compare results obtained in these years.

2.4.2.3.1. River sediments

The river sediments monitoring network comprises 301 observation sites, including river monitoring benchmark points [13]. The observation sites are located in:

- at the river basin closure, in mouths of rivers longer than 60 km (since 2010, longer than 50 km);
- at the river basin closure, in mouths of rivers shorter than 60 km (since 2010, shorter than 50 km) if waste water from large urban centres or industrial plants are discharged into them;
- in sites distributed along the course of rivers longer than 100 km, located at closure of individual river basin (e.g. Vistula, Odra, Warta, Narew, Bug, Pilica, San and Proсна):
 - downstream from mouths of water courses and rivers longer than 50 km;
 - downstream of major cities or towns with industrial plants.
 - on rivers longer than 50 km flowing in to or out of Poland.

The observation network is divided into basic monitoring sites where sediments for tests are sampled annually and operating monitoring sites where sediments are tested once in three years.

Persistent organic pollutants are tested in selected monitoring sites, and the scope of chemical determinations includes:

- 7 congeners of polychlorinated biphenyls (PCBs) - PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180 (tested since 2004);
- 13 organochlorine pesticides - α -HCH, β -HCH, γ -HCH, δ -HCH, heptachlor, aldrin, heptachlor epoxide, dieldrin, p,p'-DDE, p,p'-DDD, p,p'-DDT, endrin and endrin aldehyde (tested since 2004);
- 17 polycyclic aromatic hydrocarbons (PAHs) - acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(e)pyrene, perylene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, benzo(g,h,i)perylene (tested since 1990).

Comparison of the measurement results should take into account that between 2005 and 2009 there have been changes in monitoring concerning the number and location of measurement sites.

Figure IV shows the changes in geometric mean concentrations of persistent organic pollutants covered by the Convention, tested as a part of monitoring in river sediments in each region of the Water Management Boards in the years 2004-2009.

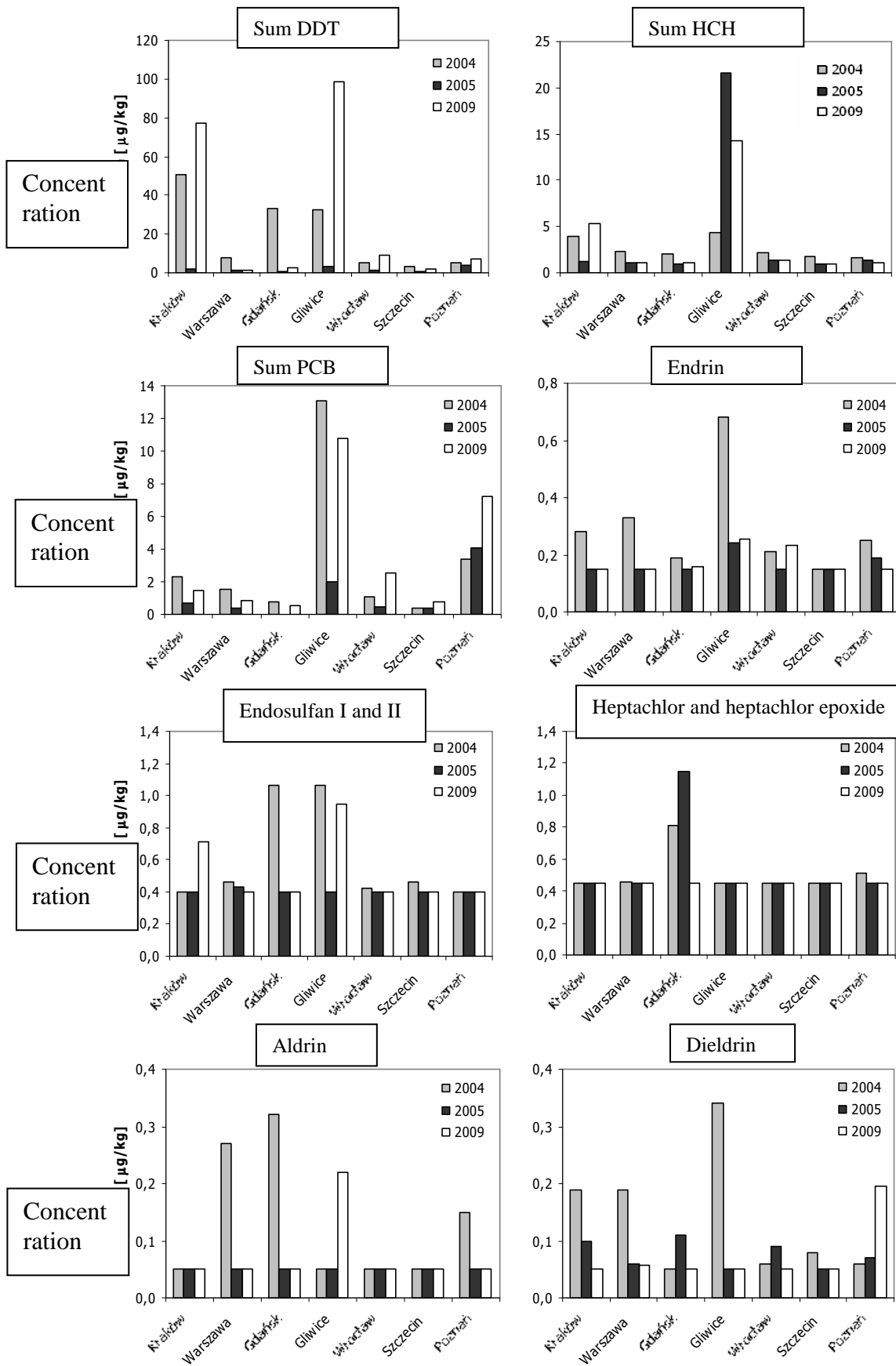


Fig. IV. Change in concentrations of POPs covered by the Convention in river sediments tested in each region of Water Management Boards in the years 2004-2009 [14,15]

Figure V shows the changes in geometric mean concentrations of all 15 PAHs, tested as a part of monitoring in river sediments in each region of the Water Management Boards in the years 2000-2009.

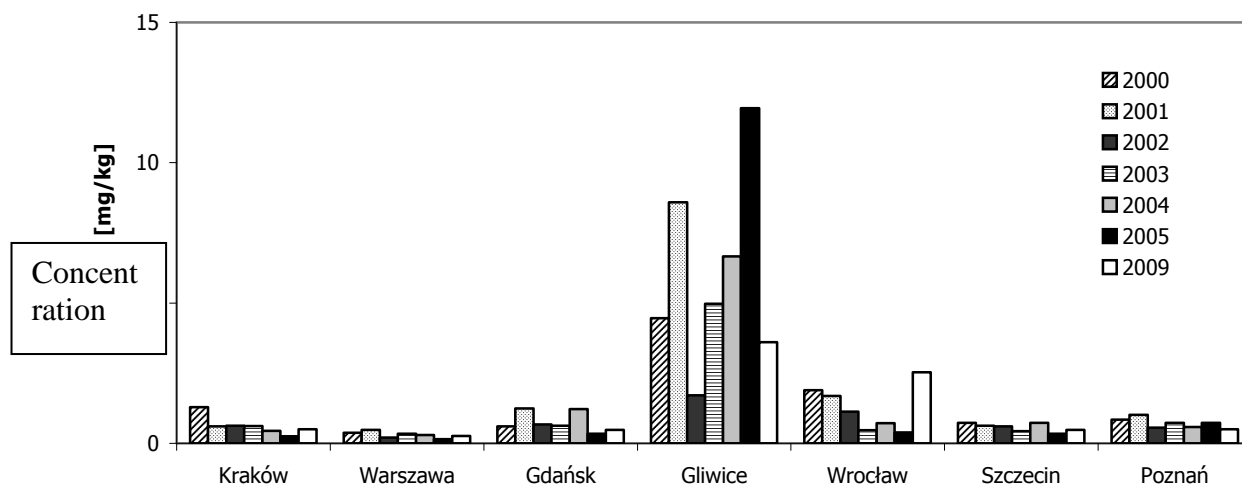


Fig. V. Change in concentrations of the sum PAH 15 in river sediments tested in each region of Water Management Boards in the years 2000-2009 [14,15]

In tests conducted under the National Environmental Monitoring in 2004-2005, content of the sum of determined **PCB** congeners in the tested sediments was from <0.5 to $84.6 \mu\text{g}/\text{kg}$. Geometric mean PCB content, higher than the detection limit, was found in sediment samples collected at the Regional Water Management Boards in Gliwice, Cracow and Poznań.

In 2009, PCB content in the tested river sediments above the detection limit for at least one congener was found in 147 samples. Sum PCB content exceeding $10 \mu\text{g}/\text{kg}$ was found in 12 samples.

In tested river sediments, the content of **HCH isomers**: α -HCH, β -HCH, γ -HCH (lindane), δ -HCH, was between <2.0 and $122 \mu\text{g}/\text{kg}$. Highest concentrations of these compounds were found in sediments in the regions of Cracow and Gliwice Water Management Boards. In many locations, γ -HCH was found in concentration at which an adverse impact on aquatic life is observed ($>1.38 \text{ mg}/\text{kg}$).

Presence of **DDT** and its metabolites was found in nearly all tested sediment samples, and the content was between <0.7 and $453 \mu\text{g}/\text{kg}$. The highest concentrations of **p,p'-DDT** were found in sediments collected from the Brda river in Bydgoszcz (Gdańsk Water Management Board), the Vistula River in Oświęcim and Tyniec (Cracow WMB), and in many of the samples tested it was present in concentrations above which an adverse impact on aquatic organisms is observed ($1.19 \mu\text{g}/\text{kg}$).

The **p,p'-DDE** metabolite was found in nearly all tested sediment samples and was the most common metabolite found. In some samples it was present at a concentration above which an adverse impact on aquatic organisms is observed ($6.75 \text{ mg}/\text{kg}$). Highest p,p'-DDE concentrations were found in sediments from Vistula in Oświęcim (Cracow RWMB), Bystrzyca river in Spiczyn (Warsaw RWMB) and Brda river in Bydgoszcz (Gdańsk RWMB). Highest p,p'-DDE concentrations were found in sediment samples from Vistula in Oświęcim and Tyniec (Cracow RWMB), Bystrzyca river in Spiczyn (Warsaw RWMB) and Brda river in Bydgoszcz (Gdańsk RWMB).

In 2009, the presence of p,p'-DDT in river sediments were found in 117 samples, the p,p'-DDE metabolite in 271 analysed samples of sediments, and the p,p'-DDD metabolite in 236 samples.

Concentrations of **endrin** above the detection limit of detection in the years 2004-2005 were found in sediments taken from the measurement sites within the regions of Cracow RWMB, Warsaw RWMB, Gliwice RWMB, Poznań RWMB, and Gdańsk RWMB. In sediments from the Bystrzyca river in the region of Warsaw RWMB endrin was found in concentration which may adversely affect aquatic organisms.

Concentration of **aldrin** in sediments above the detection limit was found in sediments collected from the Black Hańcza river in Frącki (Warsaw RWMB), the Liwa river in Biała Góra (Gdańsk RWMB), or the Narew river in Pułtusk (Warsaw RWMB).

Endosulfan I and **endosulfan II** in a concentration above the detection limit were recorded in sediments of the rivers Liwa, Przemsza, Bystrzyca, Wieprza or Odra in Cracow, Gdańsk and Wrocław RWMBs.

Presence of **heptachlor** or heptachlor epoxide above the detection limit was found in many locations but the concentrations were such that no adverse impact on aquatic organisms would be observed.

In 2009, aldrin, endrin, endosulfan I, endosulfan II, α -chlordane, dieldrin was found only in few samples. In none of the analysed samples of sediments taken from rivers any heptachlor, heptachlor epoxide, γ -chlordane, endosulfan sulphate, eldrin aldehyde and eldrin ketone presence was found.

In the tested river sediments, the concentration of the sum of 15 **PAH** compounds listed by US EPA, in the years 2000-2002 was from <0.035 (detection limit) to 32.03 mg/kg (Warsaw RWMB), in 2003-2005 from <0.033 to 49.41 mg/kg (Gliwice RWMB), and in 2009 from <0.033 to 43.51 mg/kg (Wrocław RWMB).

Geometric means of PAH concentrations in sediments in the areas of individual RWMBs in the years 2000-2002 were from 0.20 mg/kg (Warsaw RWMB) to 8.59 mg/kg (Gliwice RWMB), in 2003-2005 from 0.134 mg/kg (Warsaw RWMB) to 11.94 mg/kg (Gliwice RWMB), and in 2009 from 0.27 mg/kg (Warsaw RWMB) to 3.61 mg/kg (Gliwice RWMB).

2.4.2.3.2. Lake sediments

Test of lake water sediments are performed in lakes designated annually by the Inspectorate for Environmental Protection from among lakes in the regional monitoring network (every year sediments from 100-150 different lakes are tested) and in 10 benchmark lakes of the national lake monitoring network (since 2009 in 23 lakes) [13]. Tests in the lakes in the regional network are performed every few years, mostly every five years, while in the benchmark lakes in the national lake monitoring network every 2 years.

Persistent organic pollutants are tested in selected monitoring sites, and the scope of chemical determinations includes the same substances as the river sediments tests.

Determinations of PCBs, organochlorine pesticides and PAHs content in the years 2004-2005 were performed in sediment samples taken in eighty observation sites tested on an annual basis and in samples taken every two years from the benchmark lakes [14]. PAH determinations in 2000 were performed in 85 samples of lake sediments, and in 2001 in 9 samples. In 2009, the determinations were performed for 148 lakes [17].

Tests conducted under the National Environmental Monitoring in the years 2004-2005, determinations of **PCB** content in benchmark lake sediments have shown their presence in small amounts (below 1 $\mu\text{g}/\text{kg}$) in sediments of only 2 lakes, one from the Warsaw RWMB region and one in the Wrocław RWMB region.

In 2009, the presence of PCBs in lake sediments was found in about 65% of samples tested. Determined concentrations of PCBs in lake sediments were low.

In 2009, of HCH isomers α -HCH was found in sediments of 8 lakes (the highest content of 2.5 mg/kg), β -HCH was found in sediments of 22 lakes (with the highest content of 7 mg/kg). The most commonly found isomer was γ -HCH (lindane) which was present in 44% of the samples tested (the highest content of 2.6 μ g/kg).

None of the tested sediment samples contained DDT. The **p,p'-DDE** metabolite was found in all tested sediment samples and its content was between 0.5 to 5.6 μ g/kg (in sediments from 3 lakes in Poznań RWMB region); a content which may have an adverse impact on aquatic organisms was found. The **p,p'-DDD** metabolite was found in sediments from only 3 lakes. In 2009, p,p'-DDT was found in 54 samples, representing 36% of samples tested. The p,p'-DDE metabolite was present in all tested sediments (the highest content of 63.5 mg/kg). The p,p'-DDD metabolite was present in 96.67% of samples tested (the highest content of 70.1 mg/kg).

In the tested lake sediments, the content of sum of 15 PAH compounds listed by US EPA in the years 2000-2001 was from 0.036 to 39.82 mg/kg, in 2003-2005 from 0.521 to 9.752 mg/kg, and in 2009 from <0.033 to 49.09 mg/kg. High PAH content above 10 mg/kg was found in the years 2000-2001 in 6 lakes, in the Warsaw, Gdańsk, Szczecin and Poznań RWMBs regions.

In general, lake sediments are characterized by a higher content of PAHs than river sediments due to a very large proportion of organic material in lake sediments.

2.4.2.3.3. The Baltic Sea sediments

Baltic Sea sediments are tested as a part of the National Environmental Monitoring every five years [13].

In 2007, as a part of the National Environmental Monitoring, sediments from the Gdańsk Deep, the Vistula Lagoon and the Gotland Deep were tested (Table V). Of POP substances, the following were tested:

- seven PCB congeners (PCB 28, PCB 52, PCB 101, PCB 118, PCB 138, PCB 153, PCB 180);
- three HCH isomers (α -HCH, β -HCH, γ -HCH);
- HCB;
- DDT (o,p'-DDT, p,p'-DDT) and its two metabolites (p,p'-DDE and p,p'-DDD).

Table V. Metadata from marine stations [15]

Station	Longitude	Latitude
P1 - Gdańsk Deep	19.33333	54.83333
KW - Vistula Lagoon	19.58333	54.36666
P140 - Gotland Deep	18.40000	55.55500

In all surveyed locations, HCB was found in lowest concentrations (the lowest concentration was recorded in the sediments of the Gdańsk Deep - 3.38 μ g/kg DM, and the highest in the sediments of the Vistula Lagoon - 64 μ g/kg DM). Concentrations of the sum of seven PCB congeners in all tested sediments were comparable (from 3.17 μ g/kg DM in sediments from the Gotland Deep to 5.01 μ g/kg DM in sediments from the Vistula Lagoon). For sum HCH and sum DDT, the lowest concentrations were found in the sediments from the Vistula Lagoon (1.01 and 1.31 μ g/kg DM, respectively). The highest concentrations of sum HCH were found in sediments from the Gdańsk Deep (5.66 μ g/kg DM), and of sum DDT in sediments from the Gotland Deep (9.44 μ g/kg DM).

2.4.2.4. Soil

In Poland there is no regular monitoring of concentration of persistent organic pollutant substances in soil is conducted (except for B(a)P).

In October 2002, a PCB content survey of soils in Poland has been carried out [18]. Soil samples were taken from agricultural, urban and industrial areas, including former PCB production areas, in sites at least 200 m away from the nearest road. Location of sampling sites is shown in Figure VI.

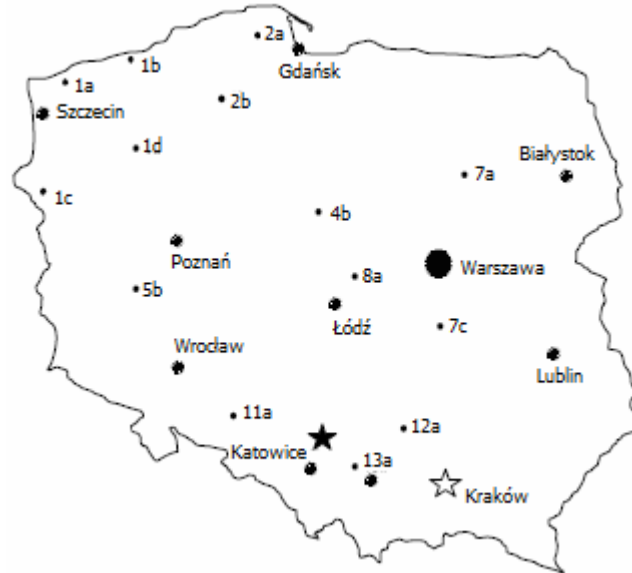


Fig. VI. Location of soil sampling points and location of former Chlorofen (filled star) and Tarnol (unfilled star) production facilities [18]

Figure VII shows concentrations of sum PCBs in soils sampled in individual measurement sites:

- vicinity of former Polish PCB production or use facilities – sites 11a, 12a, 13a,
- industrial and densely populated central Poland's regions – sites 4b, 8a,
- agricultural areas – site 7a.

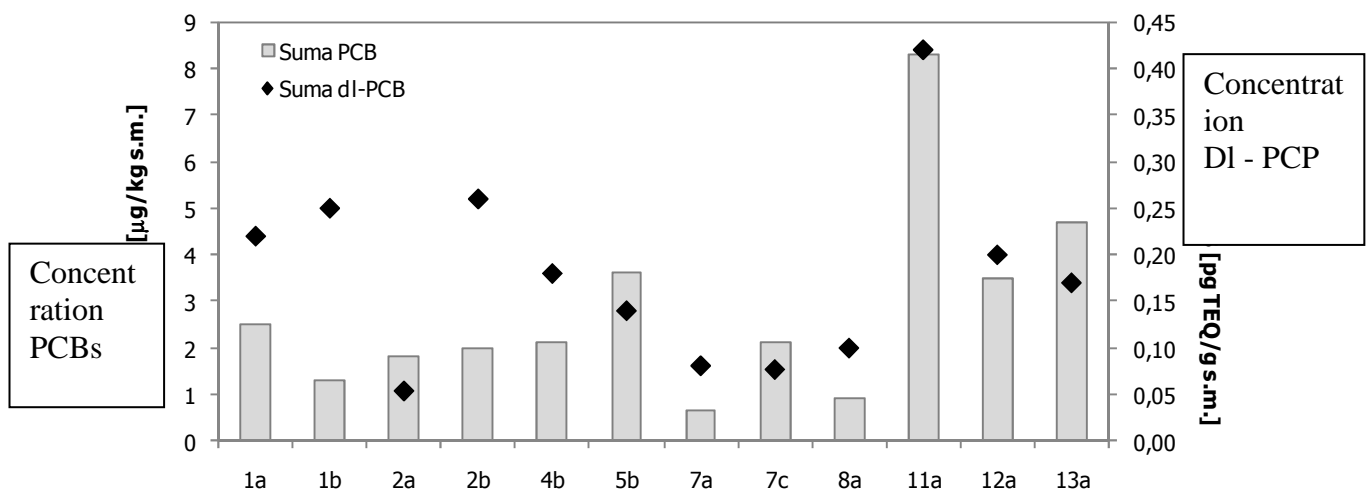


Fig. VII. Concentrations of sum PCBs and dl-PCBs in soils from individual sampling sites [18]

In the tested soil samples, total concentration of sum PCB was between 0.67 to 8.3 µg/kg DM. Increased levels of sum PCBs in soils are mostly associated with urban areas. The highest sum PCB concentrations were found in the former PCB production or use facilities (in site 12a – 3.5 µg/kg DM, in site 13a – 4.7 µg/kg DM, in site 11a – 8.3 µg/kg DM), which was more than 10 times higher than in soils from agricultural areas (0.67 µg/kg DM). dl-PCB concentrations ranged from 0.077 to 0.42 pg TEQ/g DM.

In 2009, the Institute of Environmental Protection conducted tests of PCB content in soils and plants from areas of diverse type of use [61].

Soils were sampled for tests from:

- the areas of the Forest Experimental Station in Rogów, in the Łódzkie province, Brzeziny district;
- from agricultural land in the village of Granica, the Mazowieckie province, Pruszków district;
- from industrial areas where equipment using oils with PCB were produced - former ZWAR facility in Warsaw;
- from areas along the transport routes (the Lublin route, the Poznań route, the Gdańsk route) sampled in various distances from the road (0 m, 5 m, 10 m, 20 m, 50 m, 100 m, 200 m).

The content of sum PCB in forest soils ranged from 0.11 µg/kg DM of soil in parent rock of lessive soil to 15.057 µg/kg DM. The highest sum PCB concentrations were noted in the A level: from 1.775 µg/kg DM to 15.057 µg/kg DM.

Sum PCB in soils from agricultural land ranged from 0.201 µg/kg DM of soil in parent rock to 5.741 µg/kg DM of A-level soil. The highest sum PCB concentrations were found in two profiles: 5.741 µg/kg DM and 5.357 µg/kg DM.

In both soil profiles from industrial areas the distribution of sum PCB over depth was similar: concentrations would grow from 270.9 µg/kg DM in the 0-3 cm layer to the maximum in the 3-5 cm layer: 431.5 µg/kg DM and 436.8 µg/kg DM, and then decrease to 301.5 µg/kg DM and to 160.4 µg/kg DM in the 5-10 cm layers and to much lower values in deeper soil layers.

2.4.2.5.Sludge

In Poland there is currently no regular monitoring of concentration of persistent organic pollutant substances in sludge.

In the years 1998-2007, the Institute of Environmental Protection in Warsaw conducted tests for presence of potentially toxic substances in sewage sludge [19, 20]. Tested sludge came from fifteen (in cycles I and II of tests) and then ten (in cycle III of tests) municipal waste water treatment plants in Poland, of various capacities and technologies used, from different regions of the country.

The study was conducted in 1998-2007, in three consecutive cycles. In each treatment plant in the years 1998/99 (cycle I) ten sludge samples were tested, in 2001/2002 (cycle II) five samples and in 2007 (cycle III) two samples.

In addition to the core indicators (pH, dry matter, organic matter), the tests included seven congeners of polychlorinated biphenyls (PCB 28, 52, 101, 118, 138, 153 and 180) and sixteen polycyclic aromatic hydrocarbons, listed by US EPA (naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo(a)anthracene, chryzen, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene).

Figure VIII shows the average content of seven PCB congeners in sewage sludge from waste water treatment plants in consecutive cycles of measurement.

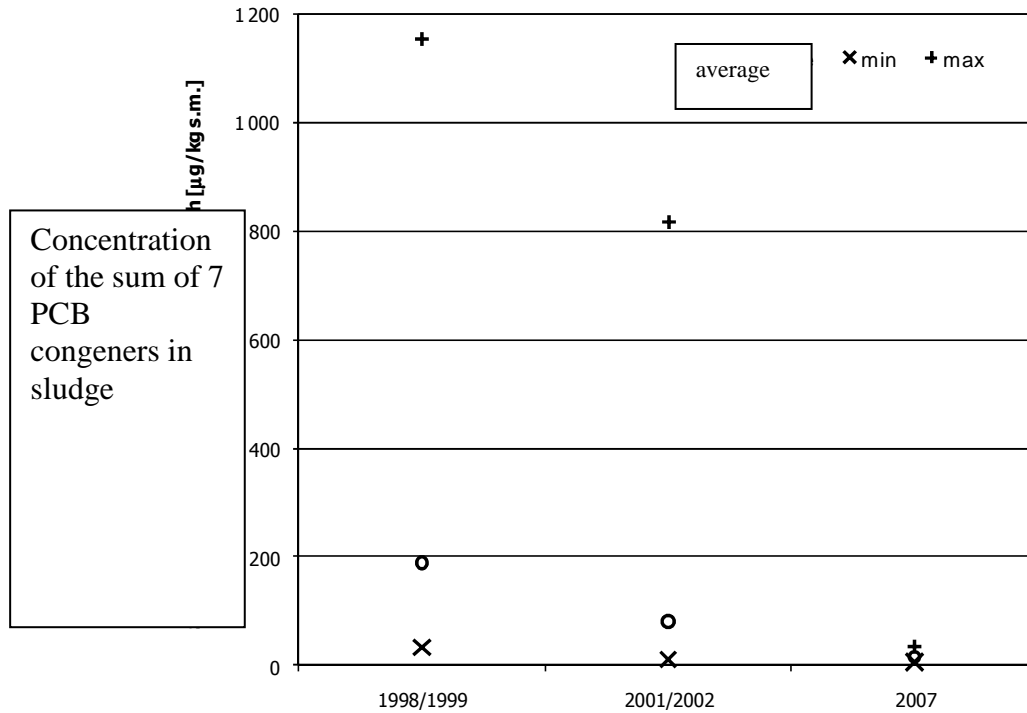


Fig. VIII. Change in concentration of the sum of 7 PCB congeners in sludge in the years 1998-2007 [19, 20]

Test results indicate a steady decline of concentration of the seven PCB congeners in sludge in the analysed years.

Figure IX shows a histogram of the total content of seven PCB congeners in sludge from ten waste water treatment plants in all cycles over the years 1998-2007.

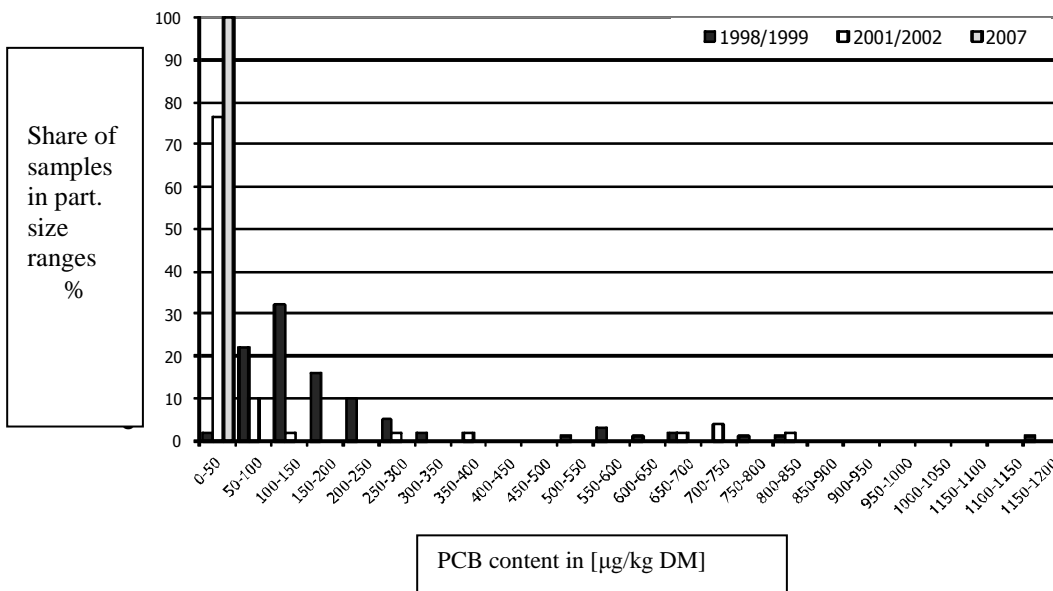


Fig. IX. Histogram of concentration of the sum of 7 PCB congeners in sludge in the years 1998-2007 [19, 20]

Analysis of test results shows a clear decline in the concentration of 7 PCB congeners in the tested sludge - over 10 years, average concentrations dropped by nearly 12 times (from 189.5 to 15.8 µg/kg DM) [20]

For many years, benzo(a)pyrene was the indicator of environmental risk from PAHs, its standard was set out in legal regulations, however in the recent years the "PAH lists" containing from 6 to 16 compounds, for which determination of their levels in the environment is recommended, have been developed. The proposed EU Sludge Directive provides for sum PAH 11 with permissible concentration in sludge of 6 mg/kg DM. Of the sixteen hydrocarbons tested by the Institute of Environmental Protection, ten is included in the 11 PAHs regulated by the Directive (benzo(j)fluorantene is missing). Figures X and XII show the average content of sum PAH 16 and 10 in sludge from waste water treatment plants tested in successive measurement cycles, and Figures XI and XIII show histograms of sum PAH 16 content in sludge from ten waste water treatment plants in all cycles in the years 1998-2007.

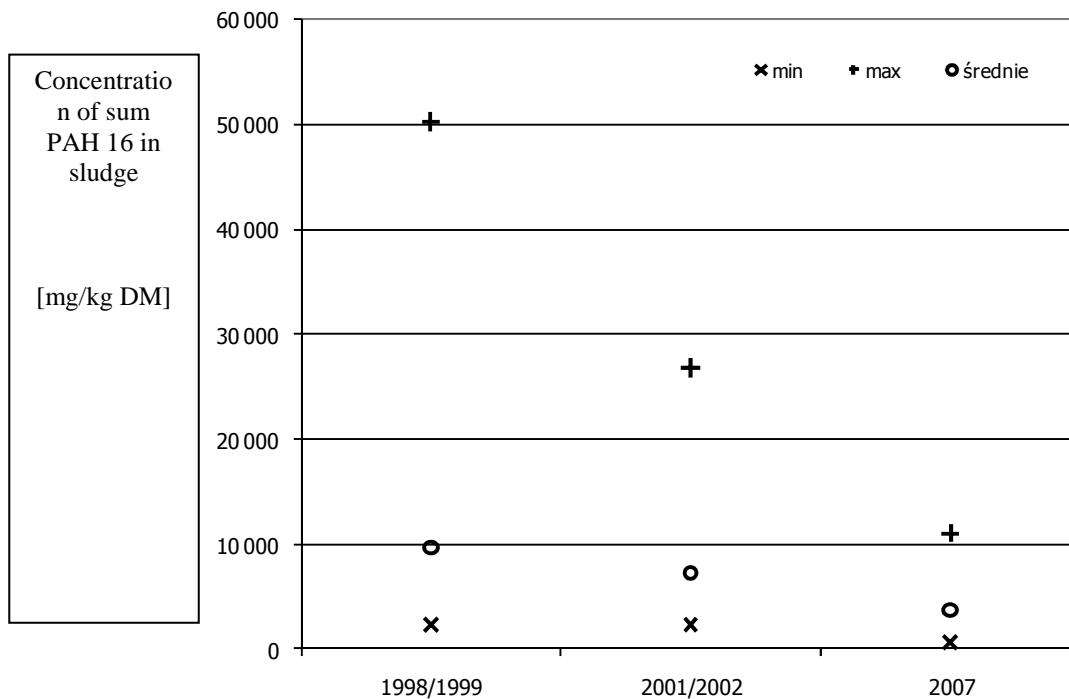


Fig. X. Change in sum PAH 16 concentration in sludge in the years 1998-2007 [20]

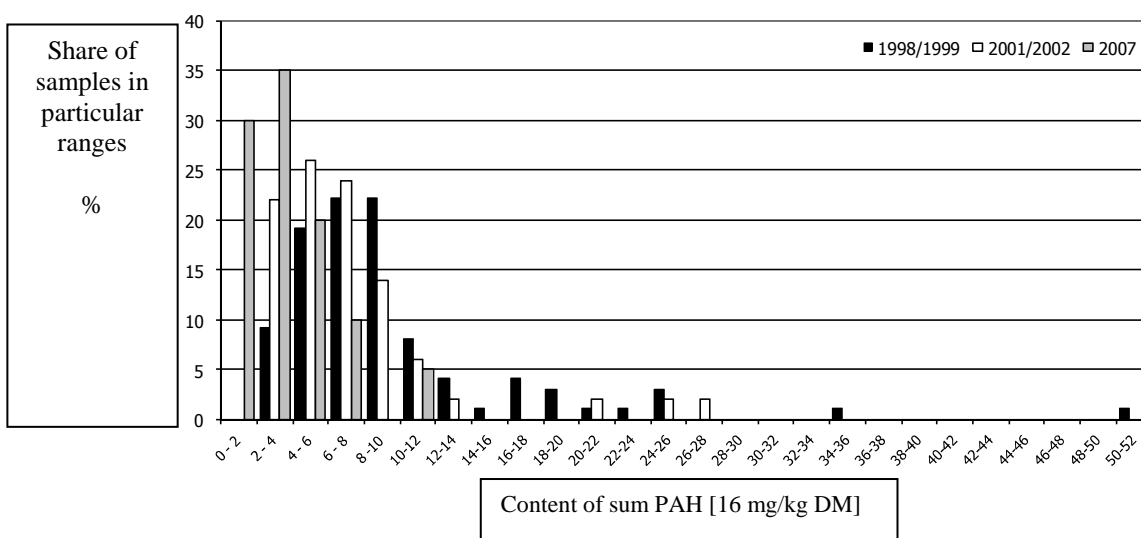


Fig. XI. Histogram of sum PAH 16 in sludge tested in 1998-2007 [20]

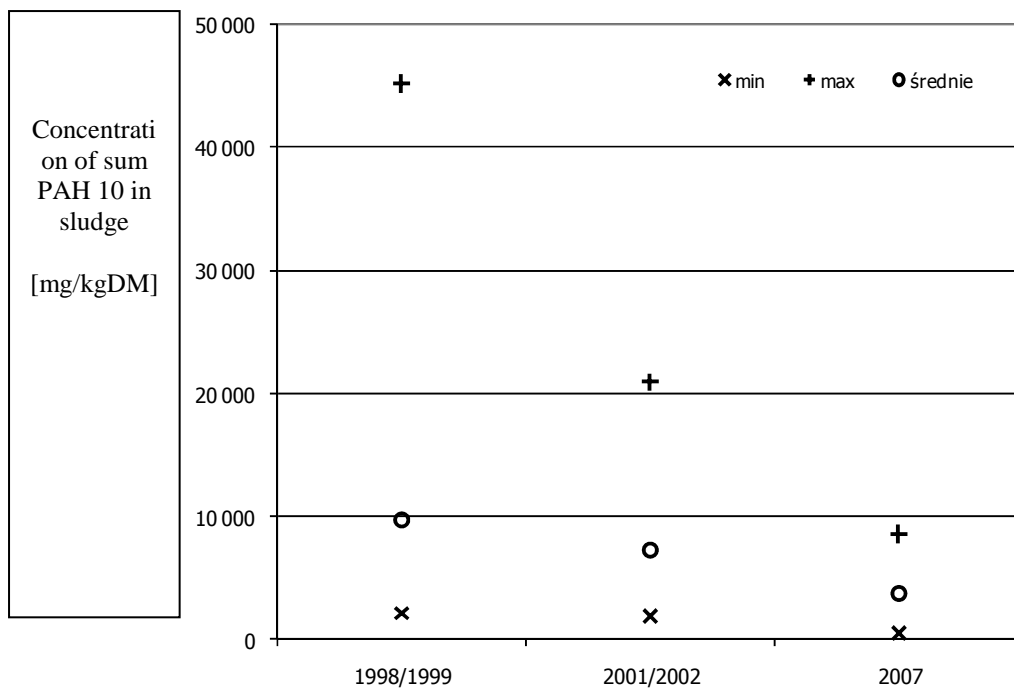


Fig. XII. Change in sum PAH 10 concentration in sludge in the years 1998-2007 [20]

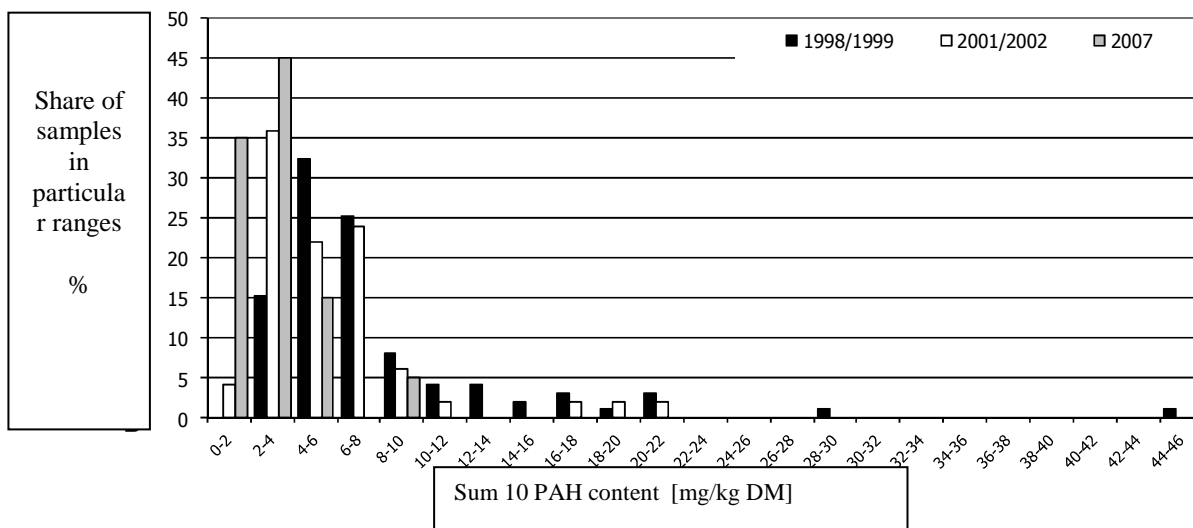


Fig. XIII. Histogram of the sum 10 PAH in sludge tested in 1998-2007 [20]

The test result analysis of PAH in sludge from ten treatment plants shows the decrease in the content of these compounds in sludge tested in successive measurement cycles [20]:

- the average content of sum 16 PAH decreased more than 2-fold (from 9.6 to 3.7 mg / kg of dry weight);
- the average content of sum 10 PAH decreased more than 3-fold (from 7.9 to 2.8 mg / kg of dry weight);

Figure XIV shows the average content of benzo(a)pyrene in sludge from wastewater treatment plants tested in successive measurement cycles, and Figure XV shows the histogram of the benzo(a)pyrene content in sludge from ten wastewater treatment plants in all cycles in the years 1998-2007.

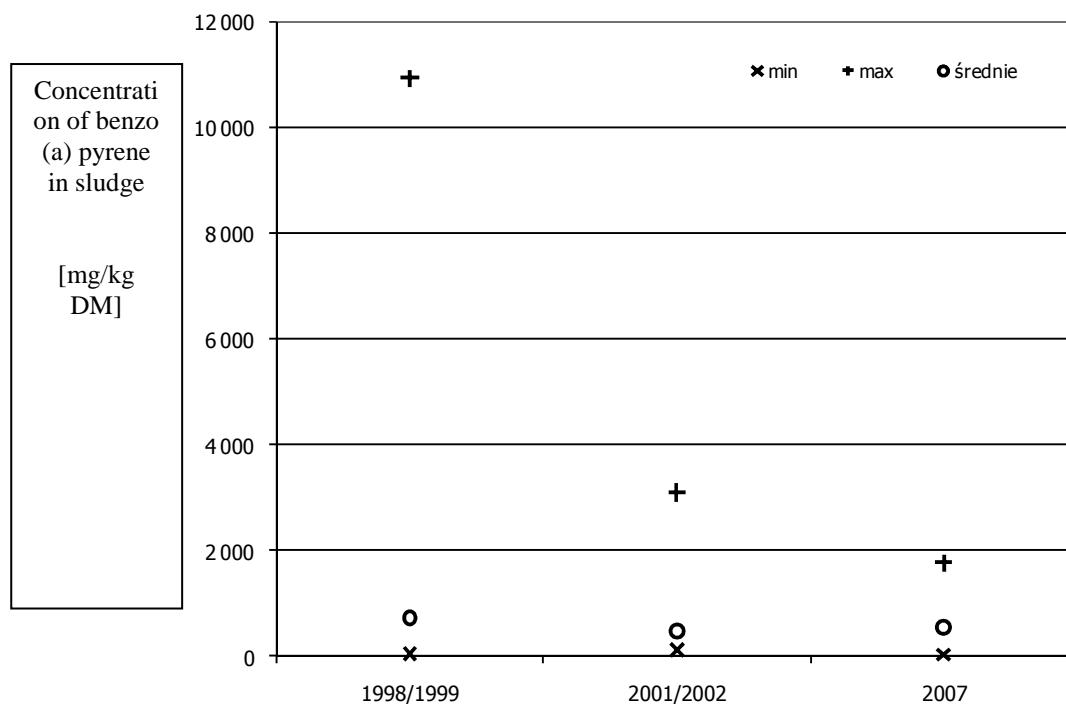


Figure XIV. Change in benzo(a)pyrene concentration in sludge, in the years 1998-2007 [20]

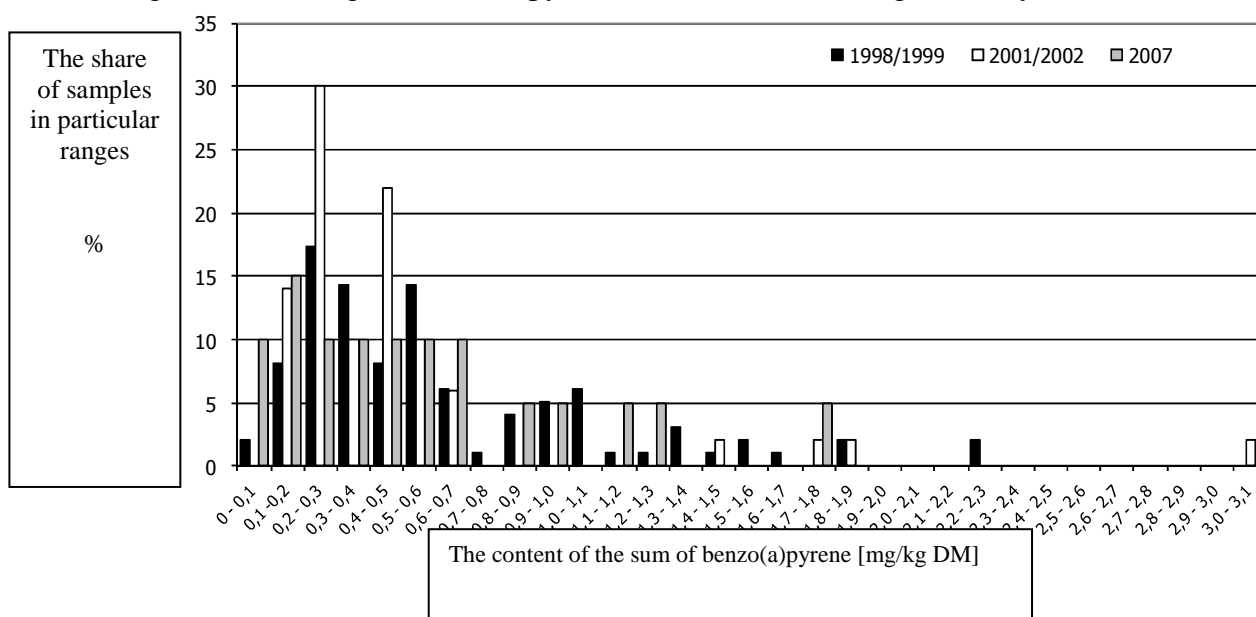


Figure XV. Histogram of benzo(a)pyrene in the sludge tested in 1998-2007 [20]

Analysis of test results of benzo (a) pyrene in sediments from ten sewage treatment plants shows that there was reduction in the average and maximum content of benzo (a) pyrene in the second cycle of testing and re-increase in the average content in the third cycle [20].

2.4.2.6. Food

The following foodstuff is examined in Poland:

- foods of animal origin (ex. meat, milk, eggs, fish, honey)
- vegetables, ex. cauliflower, peppers, tomatoes,
- fruits, ex. bananas, grapes, apples,
- cereal grains, ex. wheat, oats, rye,
- others, ex. orange juice, cider,
- foods for infants and young children.

As part of monitoring and official food control for pesticide residues, the following organochlorine compounds are examined: aldrin, dieldrin, chlordane, DDT, endrin, heptachlor, hexachlorocyclohexane (as defined by the residue), lindane and hexachlorobenzene.

Veterinary Inspection takes testing samples from pigs, cattle, horses, sheep, poultry (hens, chickens, turkeys, ducks, geese), fish, rabbits, wild game and samples of cow's milk, eggs and honey. In terms of persistent organic pollutants, the tests include defining the contents of:

- organochlorine pesticides - DDT and its metabolites, α -HCH, β -HCH, γ -HCH, HCB, aldrin, dieldrin, chlordane, endrin, endosulfan, heptachlor;
- 7 congeners of polychlorinated biphenyls - PCB 28 PCB 52 PCB 101, PCB 118, PCB 138, PCB 153, PCB 180th

In addition, since 2006, a national screening program for dioxins, furans, dioxin-like polychlorinated biphenyls (dl-PCBs) and non dioxin-like PCBs in animals and foods of animal origin (a total of 29 congeners of dioxin-like compounds) is run, which aims to:

- detect cases of exceeding the permissible levels of dioxins, furans, dioxin-like polychlorinated biphenyls (dl-PCB) and non dioxin-like PCBs in animals and foods of animal origin under Regulation (EC) No 1881/2006 of the Commission of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs (EU Official Journal L 364 of 20.12.2006, p. 5),
- explore and reveal the reasons for the development and the occurrence of cases exceeding the permissible levels of dioxins, furans, dioxin-like PCBs and dl non dioxin-like PCBs in food products of animal origin in order to protect public health,
- control food products of animal origin in order to determine compliance with the requirements of veterinary legislation.

The principles of the program are compiled annually by the Chief Veterinary Officer and determine the number of samples to be taken for each province to carry out the tests.

Food samples for testing to determine the compactness of dioxins, furans and dioxin-like PCB compounds are collected from all over the country, in accordance with the Instructions issued annually by the Chief Veterinary Officer.

2.4.2.6.1. Raw materials and plant products

Organochlorine compounds (aldrin, dieldrin, chlordane, DDT, endrin and heptachlor) are identified in food samples of plant origin tested within a coordinated monitoring and official food control systems in terms of pesticide residues carried out by the laboratories of the State Sanitary Inspection in Poland since 2004.

Table VI shows the number of fruits, vegetables and cereals samples taken in 2004-2008.

Table VI. The number of fruits, vegetables and cereals samples taken in 2004-2008 [21].

Year	Number of samples	
	Vegetables and fruit	Cereals
2004	581	104
2005	893	150
2006	1062	151
2007	1046	156
2008	1154	150

Tables VII - XI present the results of tests carried out in 2004-2008 for organochlorine pesticide residues in products of vegetable origin as a part of monitor studies and official control of food of plant origin for pesticide residues. Reporting Level means the lowest level of residues presented in numerical form (which may correspond to the limit of quantification, or be above that level).

Table VII. The results of DDT residues in products of plant origin in the period of 2004-2008 [22]

Year	Vegetables and fruit			Cereals		
	Number of samples	Number of samples with residues	Highest Score [mg / kg]	Number of samples	Number of samples with residues	Highest Score [mg / kg]
2004	83	7	0,002	70	6	0,018
2005	266	18	0,018	100	0	n/a
2006	711	0	0,050*	151	0	0,050*
2007	859	0	0,050*	151	0	0,050*
2008	985	0	0,050*	150	0	0,050*

Table VIII. The test results of aldrin and dieldrin residues (until the end of 2006, only aldrin) in products of plant origin in the period of 2004-2008 [22]

Year	Vegetables and fruit			Cereals		
	Number of samples	Number of samples with residues	Highest Score [mg / kg]	Number of samples	Number of samples with residues	Highest Score [mg / kg]
2004	25	6	0,004	97	0	n/a
2005	318	18	0,009	150	0	n/a
2006	721	0	0,010*	151	0	0,010*
2007	877	0	0,010*	151	0	0,010*
2008	981	0	0,010*	110	0	0,010*

Table IX. The test results of chlordane residues in products of plant origin in the period of 2004-2008 [22]

Year	Vegetables and fruit			Cereals		
	Number of samples	Number of samples with residues	Highest Score [mg / kg]	Number of samples	Number of samples with residues	Highest Score [mg / kg]
2004	0	n/a	n/a	0	n/a	n/a
2005	0	n/a	n/a	0	n/a	n/a
2006	0	n/a	n/a	51	0	0,01*
2007	0	n/a	n/a	51	0	0,02*
2008	318	0	0,01*	110	0	0,02*

Tabela X. The test results of endrin residues in products of plant origin in the period of 2004-2008 [22]

Year	Vegetables and fruit			Cereals		
	Number of samples	Number of samples with residues	Highest Score [mg / kg]	Number of samples	Number of samples with residues	Highest Score [mg / kg]
2004	28	6	0,007	60	4	0,004
2005	233	8	0,030	110	0	n/a
2006	58	0	0,010*	101	0	0,010*
2007	122	0	0,010*	101	0	0,010*
2008	791	0	0,010*	110	0	0,010*

Table XI. The test results of heptachlor residues in products of plant origin in the period of 2004-2008 [22]

Year	Vegetables and fruit			Cereals		
	Number of samples	Number of samples with residues	Highest Score [mg / kg]	Number of samples	Number of samples with residues	Highest Score [mg / kg]
2004	20	5	0,001	97	23	0,006
2005	268	11	0,004	100	1	0,002
2006	703	0	0,010*	101	0	0,010*
2007	937	0	0,010*	101	0	0,010*
2008	973	0	0,010*	150	0	0,010*

* Reporting level – means the lowest level of residues, which should be presented in numerical form. It may correspond to the limit of quantification or exceed this level due to the reduction of costs, if the values of maximum acceptable residue levels (MRLs) allow.

The monitoring carried out by the State Sanitary Inspection also determined other organochlorine compounds, including hexachlorocyclohexane (as defined by the residue), hexachlorobenzene and lindane, however, detection of their presence in foods of plant origin has been sporadic.

The evaluation of these results allows to assume that the level of tested compounds in foods of plant origin is below the current value of maximum residue levels (MRLs) established by the European Parliament and the Council at the default level equal to the limit of qualification. Samples of the identified remains of organochlorine compounds, listed in the tables above, are the result of the adoption of the very low limits of quantification by some

laboratories of Provincial Sanitary-Epidemiological Stations. Adoption of so called reporting levels in subsequent years, which were recommended by the European Commission, had an impact on the research field by eliminating irrelevant area from the standpoint of safety for the consumer.

2.4.2.6.2. Raw materials and products of animal origin

Table XII presents the results of PCB **residues** in domestic and imported products of animal origin carried out in the period of 2005-2009 *under the National Programme for screening for prohibited substances and residues of chemical, biological and medicinal products in animals and foods of animal origin*.

Table XII. The test results of PCB residues in animal products surveyed in the period of 2005-2009 [23]

	Number of samples					NC - the number of inconsistent results (non-compliant)				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Test results of domestic products of animal origin										
Cattle	165	151	157	167	175	0	0	0	0	0
Pigs	265	261	271	289	272	0	0	0	0	0
Sheep / goats	20	20	20	21	20	0	0	0	0	0
Horses	30	30	37	34	32	0	0	0	0	0
Rabbits	20	19	20	21	20	0	0	0	0	0
Fish	71	66	61	59	71	0	0	0	0	0
Chickens	145	154	160	183	193	0	0	0	0	0
Turkeys	42	40	37	39	47	0	0	0	0	0
Geese	35	37	34	36	38	0	0	0	0	0
Ducks	29	24	28	27	29	0	0	0	0	0
Milk	135	120	123	131	114	0	0	0	0	0
Eggs	98	102	129	133	150	0	0	0	0	0
Honey	15	18	12	16	15	0	0	0	0	0
Farmed game animals	0	2	4	7	4	0	0	0	0	0
Wild game	82	83	80	89	104	0	0	0	7	0
Test results of imported products of animal origin										
Cattle	1	0	2	3	2	0	0	0	0	0
Pigs	20	15	6	2	1	0	0	0	0	0
Poultry	3	4	5	0	0	0	0	0	0	0
Fish	90	87	64	81	103	0	0	0	0	0
Honey	1	0	1	1	3	0	0	0	0	0
Sheep	0	0	1	0	0	0	0	0	0	0
Eggs	0	0	3	0	0	0	0	0	0	0

In 2008, PCB residues (> 50% of samples) were commonly observed in the tested samples, but their concentrations were mostly at the level of hundredths and thousandths of a mg / kg, which is a few percent of the limited values [24].

During the analyzed period, the concentrations of PCB congeners were at 0,6 mg / kg in the fat of boars (the lowest score was 533 mg / kg of fat and the highest 690 mg / kg fat) only in 2008.

Figure XVI shows the levels of dioxin-like polychlorinated biphenyls (dl-PCBs) in food samples tested in 2006-2009 under *the control tests for dioxins, furans, dioxin-like polychlorinated biphenyls (dl-PCBs) in animals and animal products*. The sum of 12 congeners of dl-PCBs were marked; the results are presented in the WHO-TEQ.

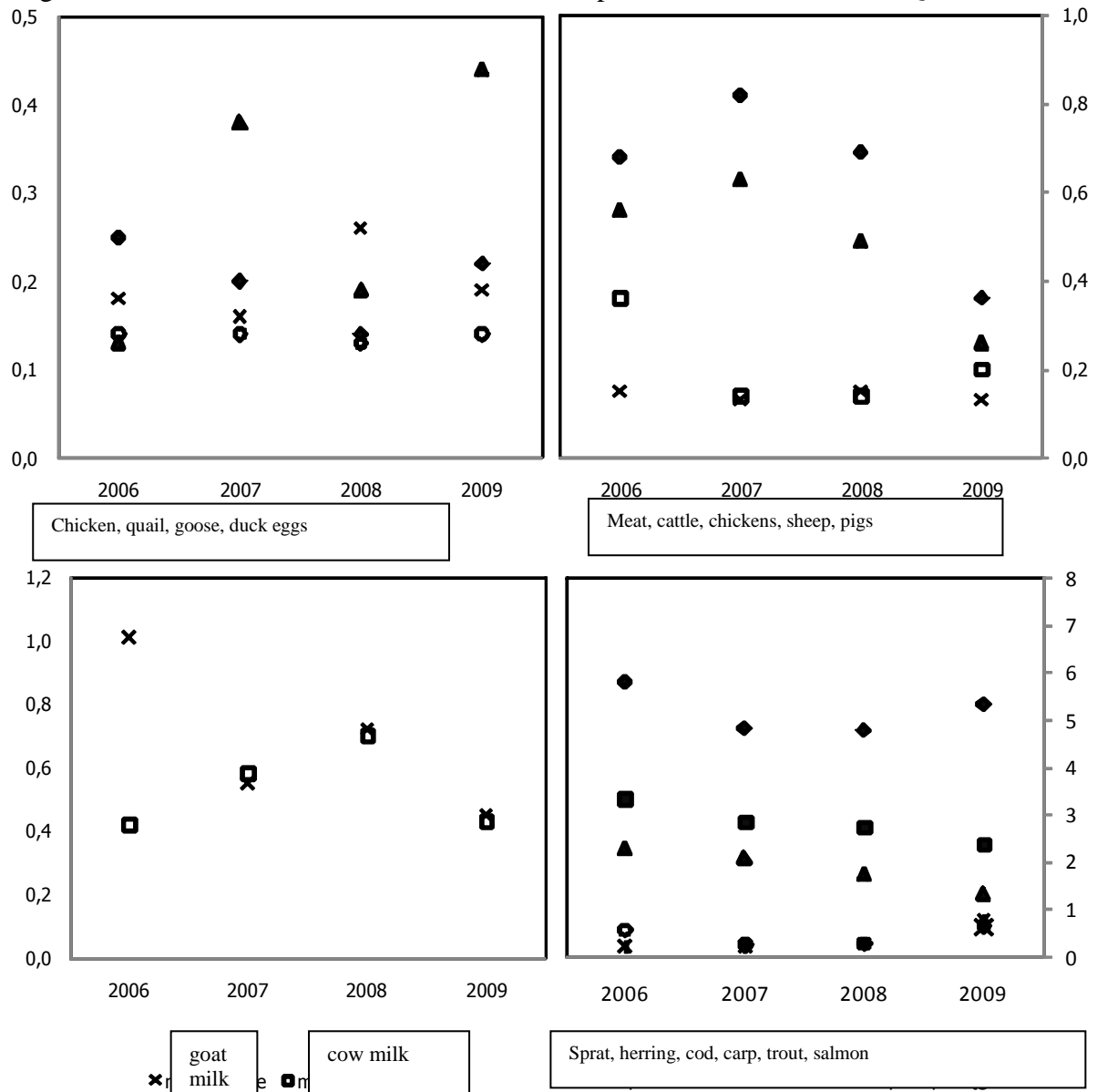


Figure XVI. Changes in the total concentration of dl-PCBs in animal products in the period of 2006-2009 (for fish, the contents are given in pg WHO-TEQ / g of fresh weight, and for other products in pg WHO-TEQ / g of fat) [25]

The analysis of the data reveals that in case of eggs marked in the period of 2006-2009, the average content of dl-PCBs ranged from 0,13 to 0,5 pg WHO-PCB-TEQ / g of fat; in the test period, the lowest and constant was the content in the eggs of quail (0,13-0,14 pg WHO-PCB-TEQ / g of fat). In these years, no clear trend for the contents of dl-PCBs in eggs was marked. In case of meat, the average content of dl-PCBs ranged between 0,13 and 0,82 of pg WHO-PCB-TEQ / g of fat in the period of 2006-2009. The meat of pigs was characterized by the lowest and the constant contents of dl-PCBs (0,13-0,15 pg WHO-PCB-TEQ / g of fat), while the cattle meat had the highest values (0,82 pg WHO-PCB-TEQ / g of fat in 2007 and 0,36 pg WHO-PCB-TEQ / g of fat in 2009). In 2007-2009, a decrease in dl-PCB concentrations in meat of cattle and sheep was observed, while in chicken meat, a slight increase in concentration was observed in 2009, following the decrease in 2006 and 2007.

DI-PCB content in milk in 2007-2009 was at the similar level for both types of milk: from about 0,6 pg WHO-PCB-TEQ / g of fat in 2007, the content increased to about 0,7 pg WHO-PCB-TEQ / g of fat in 2008 and decreased to approximately 0,4 pg WHO-PCB-TEQ / g of fat in 2009).

With regard to fish, the highest concentrations of dl-PCBs was reported in marine fish (in 2009, from 1,32 pg WHO-PCB-TEQ / g of fresh weight of herring to 5,33 pg WHO-PCB-TEQ / g of wet weight of salmon). In farmed fish - carp and trout - dl-PCB content in 2009 were 0,76 and 0,65 pg WHO-PCB-TEQ / g of fresh weight respectively.

Figure XVII presents changes in the total content of PCBs in the muscle tissue of fish from the southern Baltic in the period of 1997-2006. The following fish were tested: herring, sprat, flounder and cod caught during research cruises on the following fisheries: Szczecin Bay (PB), Kolobrzeg-Darlowo (KD), Ustka-Leba (UL), Wladyslawowo (W), Gulf of Gdansk (GG) and Bornholm station (B), the Gdansk Deep (GD) as well as salmon purchased from fishermen.

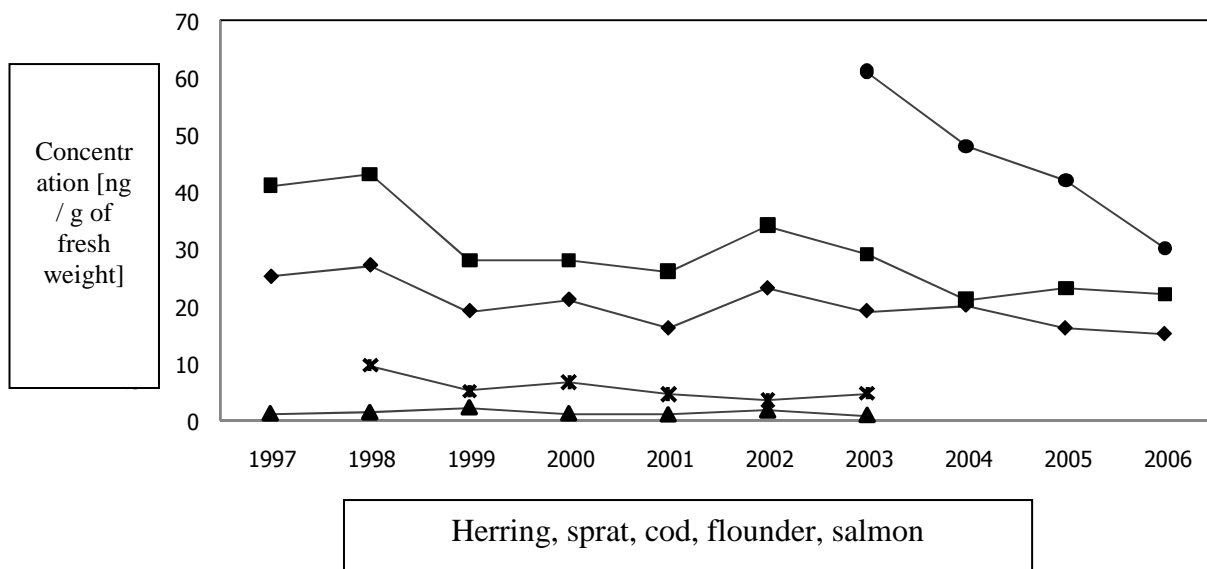


Figure XVII. Changes in total content of PCB in Baltic fish muscle tissue in the period of 1997-2006 [26]

The analysis of test results reveals a decrease in total PCB content in the muscle tissue of all species of fish except cod, in the period from 1997 to 2001, then in 2002, a slight increase is visible, and in subsequent year another decrease to the level of 2001. In subsequent years, such a clear reduction in PCB content in the tissue of herring and sprat is no longer observed.

In the test period, a visible decline in the total content of PCBs in visible in case of salmon. Due to the low proportion of fat in the total weight of flounder and cod, the total PCB concentrations per fresh weight was very low for these species of fish in comparison with other species studied.

Table XIII presents the results of organochlorine pesticide **residues** (DDT and its metabolites, α -HCH, β -HCH, γ -HCH, HCB, aldrin, dieldrin, chlordane, endrin, endosulfan, heptachlor, bromopropylate) in domestic and imported products of animal origin carried out in period of 2005-2009 under *the National Programme for screening for prohibited substances and residues of chemical, biological and medicinal products in animals and foods of animal origin*.

Table XIII. The results of DDT and HCH residues in animal products surveyed in the period of 2005-2009 [23]

	Number of samples					NC - The number of inconsistent results (non-compliant)				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Test results of domestic products of animal origin										
Cattle	165	151	157	167	175	0	0	0	0	1
Pigs	265	261	271	289	272	0	0	0	0	2
Sheep / goats	20	20	20	21	20	0	0	0	0	0
Horses	30	30	37	34	32	0	0	0	0	0
Rabbits	20	19	20	21	20	0	0	0	0	0
Fish	71	66	61	59	71	0	0	1	0	1
Chickens	145	154	160	183	193	0	0	0	0	0
Turkeys	42	40	37	39	47	0	0	0	0	0
Geese	35	37	34	36	38	0	0	0	0	0
Ducks	29	24	28	27	29	0	0	0	0	0
Milk	135	120	123	131	114	0	0	0	0	0
Eggs	98	102	129	133	150	0	1	0	0	0
Honey	15	18	12	16	15	0	0	0	0	0
Farmed game animals	0	2	4	7	4	0	0	0	0	0
Wild game	82	83	80	89	104	0	0	2	1	0
Test results of imported products of animal origin										
Cattle	1	0	2	3	2	0	0	0	0	0
Pigs	20	15	6	2	1	0	0	0	0	0
Poultry	3	4	5	0	0	0	0	0	0	0
Fish	90	87	64	81	103	0	0	0	0	0
Honey	1	0	1	1	3	0	0	0	0	0
Sheep	0	0	1	0	0	0	0	0	0	0
Eggs	0	0	3	0	0	0	0	0	0	0

During the test period in 2008, one case of non-compliance for game animals was detected: exceeding of DDT (the concentration of 1 487 mg / kg of fat). In 2009, 4 cases of exceedances were reported: DDT in pig fat (concentration of 423 mg / kg of fat), DDT in

muscle of farmed fish (concentration 666 mg / kg of wet weight), γ -HCH in pig fat (concentration 44 mg / kg of fat) and γ -HCH in cattle fat (concentration 44 mg / kg of fat). Figure XVIII below shows the average levels of dioxins and furans (PCDD / F) in food samples tested in 2006-2009 under *the control tests for dioxins, furans, dioxin-like polychlorinated biphenyls (dl-PCBs) in animals and animal products* . The sum of 7 PCDD congeners and 10 PCDF congeners (PCDD / F) were marked, the results are given in the WHO-TEQ.

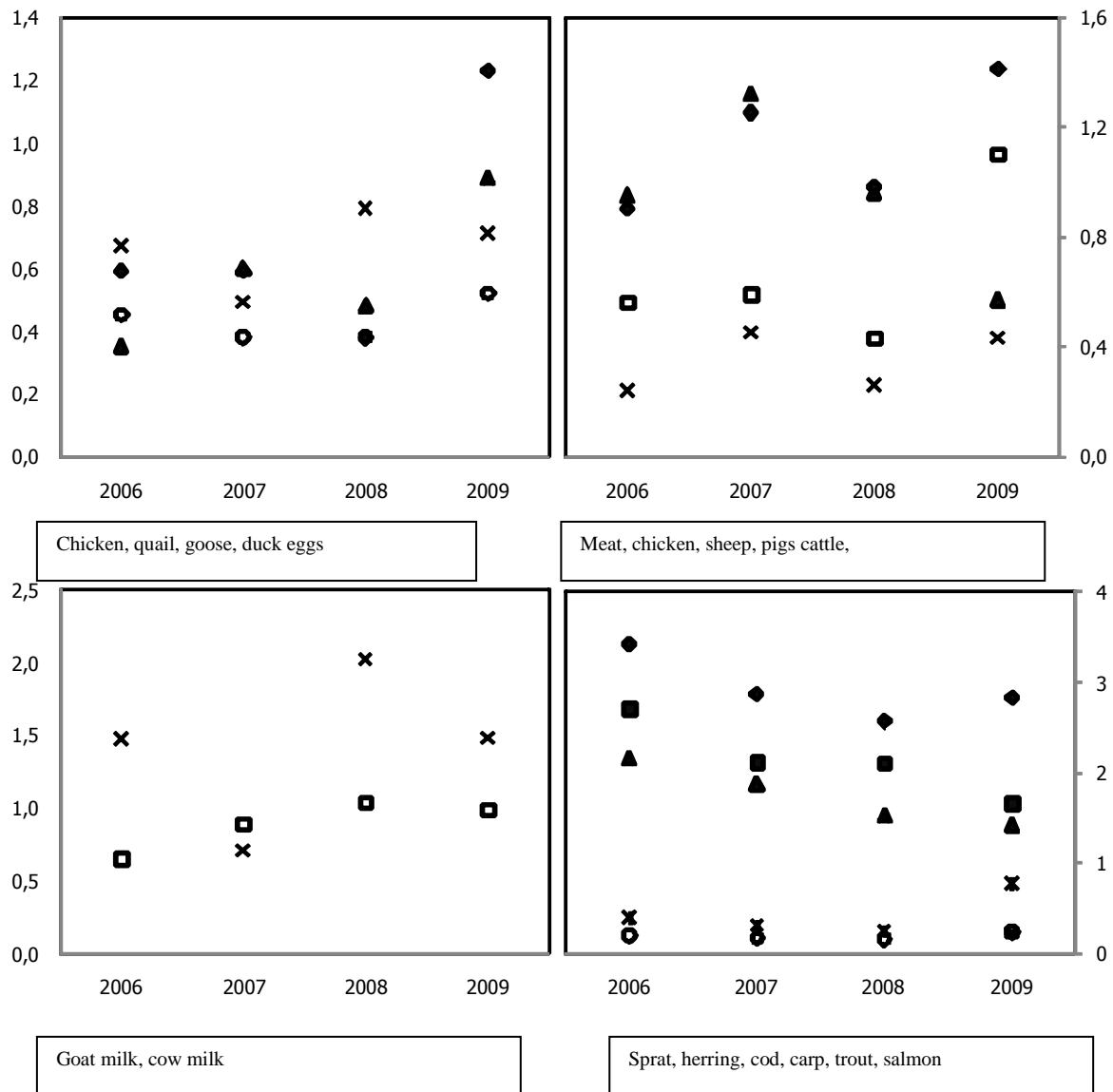


Figure XVIII. Changes in the average concentration of dioxins and furans (PCDD / F) in products of animal origin in the period of 2006-2009 (for fish, the contents are given in WHO-PCDD/F-TEQ/g pg of fresh weight, and for other products in [pg WHO-PCDD / F [TEQ / g of fat] [25]

In 2007, the exceedance of the maximum levels was confirmed in two samples of the Baltic salmon and in one sample of pig muscle. In 2008, the exceedance of the maximum levels was found in four samples of the Baltic salmon and two samples of milk. In 2009, the exceedance of the permissible limits was detected in three samples of Baltic salmon and in one sample of chicken eggs.

Analysis of the data presented in graphs shows that the total PCDD / F in most animal products increased in 2006-2009 (except for fish, sheep meat and goat milk).

During the test period, in case of eggs, a doubling of the concentration of total PCDD / F for chicken eggs (from 0,59 to 1,23 pg WHO-PCDD/F-TEQ/g of fat) and goose eggs (from 0,35 to 0,89 pg WHO -PCDD/F-TEQ/g of fat) took place.

In case of pig meat, the concentration increased from 0,24 to 0,43 pg WHO-PCDD/F-TEQ/g of fat, in cattle meet - from 0,9 to 1,41 pg WHO-PCDD/F-TEQ/g of fat, and in chicken meat - from 0,56 to 1,1 pg WHO-PCDD/F-TEQ/g of fat.

In muscle tissue of fish, the total PCDD / F decreased in 2006-2008 to rise in 2009 for salmon and carp and continue to diminish for sprat and herring.

2.4.2.6.3. Feeds

Organochlorine compounds (aldrin, dieldrin, chlordane, DDT, endrin and heptachlor) are identified in the feed samples tested in the monitoring and official control of feeds in terms of pesticide residues, carried out by the Veterinary Service Establishments in Poland since 2004. Also since 2004, ongoing research is being conducted towards the determination of dioxins and non dioxin-like PCBs in feeds.

The principles of the program are compiled annually by the Chief Veterinary Officer and determine the number of samples to be taken in each province to carry out the tests.

Material to be sampled are the feeds materials of plant and animal origin as well as compound feeds for animals. Samples for dioxins and non dioxin-like PCBs are collected mainly from fish meal and feeds containing fats, from baking industry products intended for feeds, from food industry oil, as well as from feed materials of plant origin undergoing a drying process using heating oil.

In 2008, Veterinary Inspection collected a total of 381 samples of feed materials and 85 samples of compound feeds, including 316 samples of cereal products, for determination of pesticide residues in feeds. The study results revealed 8 cases of exceedances of pesticide levels provided by legislation. Table XV shows detailed information about the type of the exceeded substance and the pesticide level identified as a result of laboratory tests.

In 2009, research was conducted toward determination of dioxins level and pesticides content in feed materials and compounds. Determination of dioxins level was conducted in 258 samples and of pesticide residues in 419 samples. In result of the control, two exceedances in dioxins level in cereal products was detected.

Table XIV. Test results of organochlorine pesticides, dioxins and PCBs residues in feeds in the period of 2004-2009.

Research Direction	Scheduled	Taken	not meeting the requirements
2004			
Chloro-organic pesticides		3	0
Dioxins (PCDD+PCDP. dioxin-like PCB)		268	
PCB (container/ <i>dl</i> 23. 52, 101. 11S, 133. 153. ISO)		111	0
2005			
Chloro-organic pesticides		339	0

Dioxins (PCDD-PCDP, dioxin-like PCB)		405	3
PCB (containers No. 28, 52, 101 11S, 13 S, 153, 180)		302	0
2006			
Chloro-organic pesticides	158	332	0
Dioxins (PCDD-PCDP dioxin-like PCB)	144	339	3
PCB (containers tir 23. 52. 101. 118, 133. 153, ISO)	160	212	0
2007			
Chloro-organic pesticides	158	215	0
Dioxins (PCDD + PCDP, dioxin-like PCBs)	80	134	3
PCB (containers ur 28, 52. 101. 11S. 13 S, 153, ISO)	160	124	0
2008			
Chloro-organic pesticides	160	220	8
Dioxins (PCDD-PCDF, dioxin-like PCBs)	80	131	1
PCB (containers No. 28, 52. 101, 113. 138, 153, 180)	160	126	0
2009			
Chloro-organic pesticides	160	213	0
Dioxins (PCDD + PCDF, dioxin-like PCBs)	160	181	2
PCB (containers tir 28, 52, 101. 11S. 13 S. 153, ISO)	80	77	0

Table XV. Reported exceedances of chloro-organic pesticide residues in feeds in 2008.

Research material	Substance found	Level detected, mg / kg
Ground grain- wheat, barley, oats	pHCH	0,070
	Aldrin	0,058
	Chlordane	0,056
Oats	HCB	0,023
	Cis-chlordane	0,022
Ground grain - oats, barley, wheat	pHCH	0,020
	Cis-chlordane	0,034
Triticale	pHCH	0,014
Oats, rye, triticale, bran p« lands	HCB	0,014

Wheat bran	pHCH	0,035
	Dieldrin	0,012
	Cis chlordane	0,029
	a-endosulfan	0,024
Wheat bran	Aldrin	0,020
	Dieldrin	0,018
Barley ground grain	Aldrin	0,020
	Dieldrin	0,018

2.5. Technical support

As of 30 June 2010, limited help was offered to Armenia (expert visit) and Nepal (consultation via electronic means) in the development of plans for implementation of the Convention by these countries.

2.6. Financial resources and mechanisms

The tasks of public administration and public bodies are financed within the limit of expenditure provided in the budget act in the appropriate parts of the state budget. National Fund for Environmental Protection and Water Management (NFOŚiGW) provides investment loans for projects aiming to neutralize wastes containing PCB or PCT and decontaminate equipment or installations containing PCB or PCT under the program *Management of Non-Communal Waste*, from which the entrepreneurs may benefit. The program's budget for the period of 2010 – 2012 amounts to PLN 10,5 million³.

After a particular entity files the grant application, NFOŚiGW analyses the document on the basis of certain criteria for selection of projects. The grant award is determined by the order of application, its completeness and the detailed procedure laid down in the internal regulations of NFOŚiGW.

2.7. Synergy

The Basel, Rotterdam and Stockholm Convention, under the decision of the Conference of the Parties to the above three conventions, implement steps to enhance cooperation and coordination of the work undertaken by them. This process, known as the three conventions synergy, aims to increase the effectiveness of the Basel, Rotterdam and Stockholm Conventions to avoid taking separate actions in the same areas and to enhance savings of funds for the objectives of these conventions. The implementation of synergy process will take place at the global, regional and national levels.

The works related to synergy on the international forum enter the more advanced phase of operations following the decisions taken by the Extraordinary Conference of the Parties to the Basel, Rotterdam and Stockholm Conventions, which took place in Bali in 22 -24.02.010. For

³) Information from www.nfosigw.gov.pl

this reason, the synergy process at national level should also begin to move toward practical implementation of the goals.

Accordingly, the operations of the three Conventions must be included in the National Plan of Implementation of the Stockholm Convention. The works related to synergy in Poland should be focused on implementation of projects related to chemical safety at national level, through harmonization of the Basel, Rotterdam and Stockholm Conventions Polish Office and the development of information necessary to establish a uniform policy regarding environmental protection and human health. In implementing the above mentioned tasks, it would be advisable to form an expert platform for Basel, Rotterdam and Stockholm Conventions supporting the activities of the Ministry of Environment in the Polish chemical policy. The aforementioned platform would effectively support the process of implementing the requirements of the above mentioned conventions in Poland at the organizational, factual and technical level and facilitate internal communication among the responsible individuals as well as promote the objectives of synergy. The operations of the expert platform would take place in collaboration with national secretariats for the Basel, Rotterdam and Stockholm Conventions, while maintaining the independence of the above mentioned secretariats.

3. PLANNED ACTIVITIES

Implementation of the requirements of the Conventions should proceed in a way that ensures optimal results in terms of protecting human health and the environment.

The obligations of EU Member States in implementing the obligations under the Convention are set out in Regulation (EC) No 850/2004. Member States are required to develop their own plans to implement the Conventions (Article 8 of the Regulation), monitor the presence of dioxins, furans and PCBs in the environment (Article 9 of the Regulation), participate in information exchange programs (Article 10 of the Regulation), technical assistance programs (Article 11 of the Regulation), to report (Article 12 of the Regulation) and establish penalties for infringements of the Regulation (Article 13 of the Regulation).

Monitoring data and research findings confirm the presence of POPs in the environment and their tendency to accumulate in the tissues of living organisms. The results of studies conducted in the recent years, concerning the content of POPs in the tissues of humans [27, 28], did not allow to form unequivocal conclusions about the pace of accumulation processes of POPs in organisms, but data from the monitoring of food products of animal origin show cases of exceedances of maximum concentration in these products. Harmful effects of dioxins and furans on human body should not be underestimated, hence any measures taken to reduce their emissions to the environment are fully justified.

Poland, since the Convention came into effect, fulfils largely the basic obligations arising therefrom, especially in relation to the disposal of obsolete pesticides and PCB-contaminated oils, as well as reduction of unwanted emissions. Analysis also shows that other tasks to be completed are primarily a continuation of activities undertaken in the previous years.

Due to low awareness of Polish society of the dangers of persistent organic pollutants, it is necessary to increase it in various social groups by, among others, providing broad access to reliable and comprehensive information, including the issues of POPs in the educational programs and strengthening the role of NGOs in raising public awareness.

Institutional and legal system in Poland, in relation to various aspects of POPs issues, is sufficiently developed. Poland has the necessary research potential to allow research in monitoring, control and elimination of POPs, as well as risk assessments of the presence of POPs in the environment for health and agricultural production.

As indicated earlier in regulations herein, in Poland, further implementation of the tasks adopted by the Convention will require continuation of works planned in environmental programs, policies and other planning documents in respect of:

- increase of the scope and assurance of the flow of accurate information to decision makers, enabling the decision making of economic and social character,
- smooth operation of the monitoring of substances covered by the Convention,
- evaluation of the impact of POPs on the environment and human health,
- security of the investment as required by the provisions of Conventions.

Analysis of the capacity to implement the Convention in Poland as of 30 June 2010, showed that there are favourable conditions for the following:

- lack of import and production of POPs,
- non-use of POPs in the economy,
- reliable data on emissions of POPs into the air,
- satisfactory condition of the legislation,
- qualified research staff,
- state and local government is able to carry out tasks under the Convention,
- market transformation promoting industrial modernization,
- considerable potential for technical facilities operating for the elimination of releases and disposal of POPs,

- completion of a significant actions for the liquidation of:
 - waste plant protection products withdrawn from use and stored in waste repositories, of which disposal will be completed in 2010 in accordance with the provisions of *2010 National Waste Management Plan*,
 - waste of polychlorinated biphenyls (PCBs), which withdrawal from the use and disposal of is to be completed in 2010.

However, the following unfavourable conditions were identified:

- inadequate laboratory facilities,
- lack of information on releases of POPs to the soil, waste and products, and levels of substances as POPs in air, soil and waste, covered by the Convention,
- lack of methodologies for the determination of POPs substances in waters,
- limited number of high quality laboratory equipment,
- high cost of launching new procedures in the laboratories in relation to the number of determinations carried out,
- limited data on the exposure of humans by the dioxins and PCBs,
- insufficient financial resources for research, monitoring, inventory and liquidation work POPs,
- low awareness of the dangers of POPs,
- burning of waste in home, commerce, and other hearths,
- difficult economic situation,
- difficult social situation, including high level of unemployment.

3.1. Tasks to be performed

Implementation of the provisions of the Conventions does not require the establishment of new institutions. All the tasks aimed at implementation of the Convention can be fulfilled by acting bodies, institutions and companies by expanding their scope of interests with issues related to persistent organic pollutants, in accordance with their respective responsibilities and activities, including the formation of Persistent Organic Pollutants Office.

In order to eliminate PCDD / F emissions from individual households, actions to reduce low-emission will be continued, aiming to reduce POPs emissions from fuel combustion in the residential sector on farms not covered by the district heating system.

In connection with the unintentional emission of PCDD / PCDF, HCB and PCBs into the air from metallurgical processes, there is need to improve technological processes, particularly processes for the preparation of iron ore sinters. Although the emissions of PCDD / F from these processes in Poland are lower than those in Western Europe, it is necessary to continue activities aimed at their further progressive reduction. The scope of these activities depends on actual emission rate in the current state of environmental protection devices. In relation to industrial processes in the iron and steel metallurgy, as well as secondary aluminium and copper metallurgy, actions will be undertaken aimed to:

- determine the actual emissions of PCDD / F, PCBs and HCB in the way of chemical analysis;
- compare results with indicative data, with measured data from other countries and BAT indicators for the whole process;
- develop and implement program of emission reduction of PCDD / F, PCBs and HCB in individual enterprises.

The condition enabling to carry out these activities will be the introduction relevant emission standards for these processes, which, if exceeded, will require the development and

implementation of the program, aimed at bringing emissions to the conditions laid down by the emission standards.

Moreover, they are and will be implemented actions related to the implementation of EU directives, under existing policy documents in Poland, aimed to:

- save energy and reduce emissions by replacing old heat plant construction of low efficiency with new appliances of high efficiency, provided with appropriate certificates of compliance with applicable standards and cooperating with a selective exhaust systems. In result of the exchange of "traditional" furnace or boiler for the boiler retort, the reduction of PCDD / F emissions by over 80% would be possible, while reducing other pollutants at the same time,
- save produced energy and fossil fuels by introducing a "clean" biomass or other renewable energy sources and best available techniques for energy production,
- save energy by using thermal efficiency improvements in buildings and automation of local distribution of heat,
- use of local excess of heat by connecting to district heating,
- market adequately trained and standardized ranges of coals, pelletized, comprimated compacted low-emission coal and biomass fuels, for their involvement in the production of small and medium enterprises.

Task 1. Creation and maintenance of Persistent Organic Pollutants Office.

Persistent Organic Pollutants Office, which serves also as the national secretariat of the Conventions, taking part in the work of the Conventions, will perform current tasks associated with the preparation of materials and support for participation in the work of the Conventions, the exercise of expertise, the inventory of releases of POPs into the environment, opinions, research and scientific studies within the agreed scope. The Office will be created within the already existing institutions.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 2. Conducting an inventory of emissions of POPs into the environment

Task 2.1. Conducting an inventory of emissions of POPs into the air, water and soil

This task includes works related to the implementation and extension of the scope of an inventory of emissions of persistent organic pollutants covered by the Convention.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 2.2. Verification of indicators of PCDD / F emissions to air

This task includes verification of indicators of PCDD/F emissions to air from the secondary production of non-ferrous metals, the sintering processes in metallurgy and the combustion of industrial and hazardous waste. The values of emission indicators are significantly affected by changes in technology and modernization of plants, among other things. Therefore, these

indicators should be periodically reviewed. This applies particularly to the major sources of emissions.

Estimated emissions from some processes are subject to considerable uncertainty. In the years 2008 - 2009, works aimed at improving the quality of data on PCDD / F emissions were carried out by supplementing and updating the many indicators of PCDD / F emissions to air. It is expedient to carry out measurements of dioxin emissions from metals production processes and the burning of industrial and hazardous waste. Revision of indicators will allow the fulfilment of the provisions of Articles 5 and 11 of the Convention, and the results will be used in official statistics on air pollution emission inventory and reporting for the Economic Commission for Europe United Nations, monitoring and evaluation of long-range transmission of air pollutants program as well as the European Environment Agency (the UNECE / EMEP and EEA).

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 2.3. Verification of indicators of HCB and PCB emissions to air

The values of emission indicators are significantly affected by changes in technology and modernization of plants, hence it is important to regularly update the indicators, particularly for major sources of emissions. In 2001, the level of HCB emissions were measured at in sinter plants and cement plants, among other places. On the basis of the findings, the applied indicators were verified and the amount of HCB emissions were estimated. It is necessary to develop national emission indicators of the production of secondary metals.

Some indicators of PCB emissions were supplemented and corrected in the last two years, based on measurement data. It is very important to update the data from the inventory of PCB-containing electrical equipment, and in the case of HCB - review of indicators of secondary production of non-ferrous metals (especially copper). The revised indicators will be applied to the program of official statistics in the inventory of air pollutant emissions and for reporting to the needs of the UNECE / EMEP and EEA. Indicators which allow the fulfilment of provisions of Articles 5 and 11 of the Convention.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 2.4. Development and validation of indicators of HCB and PCBs emissions to the other elements of the environment (excluding air)

In the case of HCB and PCB emissions to surface water, soil, products and wastes / residues, there is little data on relevant indicators, so it is important to expand this information.

The indicators will be used to develop an inventory of releases of pollutants into the environment, among other things, under the program of official statistics and reporting for the UN ECE / EMEP and EEA.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 3. Environmental education - development and implementation of information and education activities on the risks posed by POPs

A plan of information and education activities will be developed and implemented about the risks associated with the impact of persistent organic pollutants on human health and the environment.

This will be accompanied by the development of specialist websites aimed at informing employees of local and government administration of the current legislation and practice in assessing the hazard of the release of POPs into the environment.

Moreover, the issue of POPs will be more widely incorporated into school curricula at various levels.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 4. Expert opinions, reports, opinions, research and development activities on emissions and releases of POPs

Task 4.1. Conducting scientific research and R&D activities

Scientific research and R&D activities will be intensified on the basis of the existing system of research funding by the Ministry of Science and Higher Education, also co-financed by the European Union.

The conclusion of task covers the conduct of research on emissions and releases of POPs, by universities, institutes and research centres. In the first instance, they will deal with new substances covered by the regulations of the Convention.

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 4.2. Performance of analysis of the used technologies for determining the respective emission levels

The task will include preparation of a list of technologies used for each activity with the largest share of national emissions and analysis of emission levels for different technologies and the possible prospects for reducing emissions. The obtained results will serve to identify possible ways of reducing releases of POPs.

Time horizon: 2011 – 2012

Coordination: Persistent Organic Pollutants Office

Task 4.3. Analysis of the potential to use alternative methods of reduction of PCDD / F emissions in municipal services management

The assessment will require to generate a wide resource of information on alternative processes for municipal and individual heating and the expert assessment of opportunities for their use in Poland. The task is to fulfil the provisions of the EU strategy on dioxins, furans and PCBs and the provisions of Article 6 of the Convention.

Time horizon: 2011 – 2013

Coordination: Persistent Organic Pollutants Office

Task 4.4. Analysis of the potential for reducing emissions of POPs in the steel sector

The analysis will be commissioned by the Persistent Organic Pollutants Office, and its results will help identify opportunities for reducing emissions of POPs from the processes of secondary production of aluminum and copper, the production of steel in oxygen converter furnaces and sinter iron ore production. The share of this group of processes represents 8,5% of the total emissions of POPs in the national economy, and metallurgical equipment emitting POPs are quite numerous.

Time horizon: 2011 – 2013

Coordination: Persistent Organic Pollutants Office

Task 4.5. Introduction of restrictions on the use of fuels for low-emission sources

Conducting studies on solid fuels used in the municipal services management, particularly the coal, which is the principal fuel, is to limit the availability of cultivars with high content of carbon components, which have a significant impact on the quantity produced during combustion of POPs.

Time horizon: 2011 – 2012

Coordination: Persistent Organic Pollutants Office

Task 5. Determining the effect of POPs on human health and the environment

The task will involve determining the current impact of POPs on human health, associated with the presence of POPs in different environmental components (air, water, sediment, soil) and products (including food).

Time horizon: continuing task

Coordination: Persistent Organic Pollutants Office

Task 6. Monitoring the current status of national environmental pollution by POPs

Task 6.1. Extension of monitoring of selected components of the environment pollution by POPs

Implementation of the task will include extension of the National Environmental Monitoring of pollution by monitoring the pollution by persistent organic pollutants of selected components of the environment (air, soil, sewage sludge).

Time horizon: 2011 – 2016

Coordination: The Chief Inspector of Environmental Protection

Task 6.2. Monitoring of POPs releases from wastes deposited in landfills of industrial waste

The aim is to monitor the releases of persistent organic pollutants found in waste and industrial waste landfills pursuant to Article 6 of the Convention.

Time horizon: 2011-2040⁴⁾

Coordination: Persistent Organic Pollutants Office

3.2. The costs of execution of the tasks

Based on the analysis of the degree of implementation of the Convention, and the current needs in the follow-up necessary for its implementation, the costs of the tasks execution resulting directly and solely to compliance with the provisions of the Convention were calculated.

Among the costs of implementing the Convention in Poland, it is possible to isolate one-time, initial costs related to:

- membership fee,
- activities related to adapting the national legislation to the provisions of the Convention,
- formation of the Persistent Organic Pollutants Office.

One-time, initial costs - shown in Table XVI.

⁴⁾ According with Regulation of the Minister of Environment of 9 December 2002 on the scope, time, method and conditions of monitoring waste landfills (Journals of Laws, No. 220, item 1858).

Table XVI. One-time costs of implementation of the Convention.

No.	Task Name	The cost of the tasks (in million PLN)
1	Membership fee	0,08
2	Activities related to adapting the national legislation to the provisions of the Convention	0,15
3	Formation of the Persistent Organic Pollutants Office	0,30
Total		0,53

Furthermore, the implementation of Convention provisions requires considering the fixed annual costs, including:

- maintenance of the Persistent Organic Pollutants Office acting as the national secretariat of the Convention (participation in the work of the Convention),
- conducting emission inventories,
- environmental education - development and implementation of information and education activities on the risks posed by POPs,
- expert opinions, reports, opinions, research and development activities on emissions and releases of POPs,
- monitoring the impact of POPs on human health and the environment,
- membership fee.

Fixed annual costs related to implementation of the Convention tasks are presented in Table XVII.

Table XVII. Fixed annual costs of implementation of the Convention.

No.	Task Name	The cost of the tasks (in million PLN)
1	Maintenance of the Persistent Organic Pollutants Office	0,06
2	Conducting an inventory of emissions of POPs into the environment	0,10
3	Environmental education - development and implementation of information and education activities on the risks posed by POPs	0,25
4	Expert opinions, reports, opinions, research and development activities on emissions and releases of POPs	0,20
5	Monitoring the impact of POPs on human health and the environment	0,30
6	Monitoring of environment pollution by POPs	0,50
7	Membership fee	0,08
Total		1,49

The indicated costs of carrying out the tasks related to the implementation of the Convention provisions, both initial, estimated at PLN 0,53 million, and annual (PLN 1,49 million) to be borne by the state budget for 2011 and in subsequent years will be financed under the laws of the planned expenditure in budget acts and in the budget of the responsible minister, without providing additional resources for this purpose.

Financial support for the implementation of the tasks is provided by the National Fund for Environmental Protection and Water Management and provincial funds for environmental protection and water management, which provide funding for the research and development activities, expert opinions and investment projects related to the reduction of POPs into the environment and disposal of POPs.

ANNEX 1. LIST OF SOURCE DOCUMENTS

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12. Research report of the Vistula Lagoon waters conducted by the Regional Inspectorate for Environmental Protection in Olsztyn in the years 2007-2008, WIOS Olsztyn, Branch in Elbląg.
13. Landsberg-Ucziwek M. et al., Stan środowiska w województwie zachodniopomorskim w roku 2008, WIOŚ w Szczecinie, Szczecin 2009. [Condition of the environment in Western Pomerania in 2008, WIOŚ in Szczecin, Szczecin, 2009]
14. National Environmental Monitoring Programme for 2010-2012, GIOS, Warsaw 2009.
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2. SOLAS Convention on Safety of Life at Sea, 1974, issued in London on 1 November 1974 (Journal of Laws of 1984, No. 61, item 318).
3. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, made in Basel on 22 March 1989 (Journal of Laws of 1995, No. 19, item 88).
4. IMDG Code – International Maritime Dangerous Goods Code International Maritime Organization (IMO), annexed to the International Convention for the Safety of Life at Sea (SOLAS).
5. Protocol to the 1979 Convention on Long Range Transboundary Air Pollution on Long-range targeting persistent organic pollutants (POPs) - Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on Persistent Organic Pollutants (Official Journal EU L 81, 19.3.2004 p. 37).
6. The Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, made in Rotterdam on 10 September 1998 (Journal of Laws of 2008, No. 158, item 990).
7. The Stockholm Convention on Persistent Organic Pollutants, made in Stockholm on 22 May 2001 (Journal of Laws of 2009, No. 14, item 76).

EU legislation:

8. Council Directive 79/117/EEC of 21 December 1978 prohibiting the marketing and use of plant protection products containing certain active substances (EU Official Journal L 33, 8.2.1979, p. 36, as amended; ; EU Official Journal, Special edition in Polish Chapter. 3, t. 4, p. 33).
9. Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB / PCT) (EU Official Journal L 243, 24.9.1996, p. 1931-1935, as amended).
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13. Regulation (EC) No 166/2006 of the European Parliament and the Council of 18 January 2006 on the establishment of a European Pollutant Release and Transfer, amending Council Directives 91/689/EEC and 96/61/EC (EU Official Journal, L 33, 4.2.2006, p. 1).
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15. Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs (EU Official Journal L 364, 20.12.2006, p. 5).
16. Regulation (EC) No 1907/2006 of the European Parliament and the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 and Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (EU Official Journal L 396, 30.12.2006, p. 1, as amended).
17. Regulation (EC) No 689/2008 of the European Parliament and the Council of 17 June 2008 concerning the export and import of dangerous chemicals (EU Official Journal, L 204, 31.7.2008, p. 1-35).
18. Directive of European Parliament and Council 2008/98/EC of 19 November 2008 on waste and repealing certain Directives (EU Official Journal, L 312, 22.11.2008, p. 3).
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20. European Parliament and the Council 2008/1/EC of 15 January 2008 concerning integrated pollution prevention and control (EU Official Journal, L 24, 29.1.2009, p. 8).
21. Regulation (EC) No 1107/2009 of the European Parliament and the Council of 21 October 2009 concerning the placing of plant protection products and repealing Directives 79/117/EEC and 91/414/EEC (EU Official Journal, L 309 of 24.11.2009, p. 1).

Polish legal acts

22. Act of 16 March 1995 on the prevention of marine pollution from ships (Journal of Laws of 2006, No. 99, item 692, as amended)
23. Act of 9 November 2000 on maritime safety (Journal of Laws of 2008, No. 99, item 693, as amended)
24. Act of 21 December 2000 on technical inspection (Journal of Laws No. 122, item 1321, as amended).
25. Act of 27 July 2001 on implementation of the Act - Environment Protection Act, an act on waste and amending certain acts (Journal of Laws No. 100, item 1085, as amended).
26. Maritime Code of 18 September 2001 (Journal of Laws of 2009, No. 217, item 1689, as amended),
27. Act of 28 October 2002 on road transport of dangerous goods (Journal of Laws No. 199, item 1671, as amended).
28. Regulation of the Minister of Environment of 16 April 2002 on the types and concentrations of substances that cause the output is contaminated (Journal of Laws No. 55, item 498), hereinafter "Regulation on the types and concentrations of substances that cause the output is contaminated."
29. Regulation of the Minister of Economy of 24 June 2002 on the requirements for the use and handling of substances posing a particular threat to the environment and the use and cleaning of the plant or equipment, which have been or are used for substances posing a particular threat to the environment (Journal of Laws No. 96, item 860).
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40. Regulation of the Minister of Environment of 20 December 2005 on the emission standards for installations (Journal of Laws No. 260, item 2181, as amended).
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42. Regulation of the Minister of Environment of 24 July 2006 on conditions to be met for the introduction of sewage into the water or soil, and on substances particularly harmful to the aquatic environment (Journal of Laws No. 137, item 984, as amended and Journal of Laws No. 27, item 169).
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47. Act of 27 April 2001 on waste (Journal of Laws of 2010, No. 185, item 1243, as amended).
48. Act of 29 June 2007 on the international shipment of waste (Journal of Laws No. 124, item 859, as amended).
49. Act of 18 December 2003 on Plant Protection (Journal of Laws of 2008, No. 133, item 849, as amended).
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51. Regulation of the Minister of Environment of 3 March 2008 on the levels of certain substances in the air (Journal of Laws No. 47, item 281).
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59. Regulation of the Council of Ministers of 9 November 2010 on projects that may significantly affect the environment (Journal of Laws No. 213, item 1397).

ANNEX 3. GLOSSARY OF ABBREVIATIONS

α HCH	α - hexachlorocyclohexane
β HCH	β - hexachlorocyclohexane
γ HCH	γ - hexachlorocyclohexane
B (a) P	benzo(a) piren
BAT	<i>Best Available Techniques</i>
BEP	<i>Best Environmental Practices</i>
CAS	substance identification number assigned by Chemical Abstracts Service
CLRTAP	<i>Convention on Long-Range Transboundary Air Pollution</i>
CSO	Central Waste Landfill "Rudna Gora"
DDD	1,1-dichloro-2 ,2-di (4-chlorophenyl) ethane - a metabolite of
DDT	
DDE	1,1-dichloro-2 ,2-di (4-chlorophenyl) ethylene - metabolite of
DDT	
DDT	1,1,1-trichloro-2 ,2-di (4-chlorophenyl) ethane
dl-PCB	dioxin-like polychlorinated biphenyla (, dioxin-like PCBs <i>dioxin-like PCBs</i> dioxin-like PCBsdioxin-like PCBs
Journal of Laws	Journal of the Polish Republic
Official Journal	Official Journal of the European Union
ECHA	<i>European Chemicals Agency</i>
EEA	<i>European Environment Agency</i>
UNECE	United Nations Economic Commission for Europe
EMEP	<i>European Monitoring Environmental Program</i> Program for monitoring and evaluation of long-range transmission of air pollutants
EPER	<i>European Pollutant Emission Register</i>
EEC	European Economic Community
GEF	<i>Global Environmental Facility</i>
GIOS	Chief Inspectorate for Environmental Protection in Poland
HCB	hexachlorobenzene
HCH	Hexachlorocyclohexane
IJHARS	Quality Inspection of Agricultural and Food Products in Poland
IMGW	Institute of Meteorology and Water Management in Poland
IOŚ	Institute of Environmental Protection in Poland
IW	Veterinary Inspection
KASHUE-KOBIZE	National Administrator of Emissions Trading System – National Center for Balance and Emissions Managementin Poland
KPWKS	National Implementation Plan for the Stockholm Convention
VOC	Volatile organic compounds
MRL	maximum residue level
NMLZO	non-methane, volatile organic compounds
PCDD	polychlorinated dibenzodioxins
PCDF	polychlorinated dibenzofurans
PCDD/F	polychlorinated dibenzodioxins and dibenzofurans
TEQ	<i>toxic equivalent</i> ,equal to 2,3,7,8-TCDD
PCB	polychlorinated biphenyls
PCT	polychlorinated terphenyls

PIS	State Sanitary Inspection in Poland
PIORiN	Main Inspectorate of Plant Health and Seed Inspection in Poland
PIWet-PIB	National Veterinary Institute - National Research Institute in Poland
SEM	State Environmental Monitoring in Poland
POPs	<i>persistent organic pollutants</i>
REACH	Regulation (EC) No 1907/2006 of the European Parliament and the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 and Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
RZGW	Regional Water Management Board in Poland
POPs	persistent organic pollutants
EU	European Union
UNEP	United Nations Environmental Programme
UNIDO	<i>United Nations Industrial Development Organization</i>
EC	European Community
WHO	<i>World Health Organization</i>
WIOŚ	The Voivodship Inspectorate for Environmental Protection
PAH	polycyclic aromatic hydrocarbons
ZHW	Department of Veterinary Hygiene in Poland
ZWAR	High Voltage Equipment Plant