MINISTRY OF ENVIRONMENT

OF PERMANENT ORGANICS OF STOCKHOLM POLLUTANTS CONVENTION

IMPLEMENTATION PLAN

Tallinn 2011

Contents

Abbreviations and units used

DDT Dichlorodiphenyltrichloroethane (DDT)
EMEP European Monitoring and Evaluation Programme
HCB Hexachlorobenzene
HCH hexachlorocyclohexane
IARC International Agency for Research on Cancer
I-TEQ is an internationally recognized toxicity equivalent factor
MW Megawatt (MW)
PAHs are polycyclic aromatic hydrocarbons
PCBs polychlorinated biphenyls
PCDDs polychlorinated dibenzo-para-dioxins
PCDFs polychlorinated dibenzofurans
PCTs polychlorinated terphenyls,
POPs are persistent organic pollutants
PVT best possible technique
Registration, evaluation, authorization and restriction of REACH chemicals

UNEP United Nations Environment Programme
WHO World Health Organization

1. Introduction

The Republic of Estonia joined the Stockholm Convention on Persistent Organic Pollutants
By Order No. 346 of the Government of the Republic of July 31, 2008.

Stockholm Convention on Persistent Organic Pollutants (hereinafter POS) (hereinafter
convention) aims to protect human health and the environment from POS.

POS are toxic, persistent, bioaccumulative chemicals that are airborne,
with the help of water and migratory species across national borders and accumulate in aquatic and terrestrial ecosystems
far away from the source.

The convention obliges the countries that have joined it to draw up restrictions on the handling of POS
the national implementation plan *(National Implementation Plan - NIP).* The implementation plan must
provide an overview of the monitoring results of POS in the environment, food and other systems.
The implementation plan must include references to relevant strategic documents,
implementation plans, legislation, monitoring programs and POS inventory, as well
to the requirements established for the handling of POS.

As the final result of the implementation of the planned measures, the contents of the POS are considered by us
to decrease in the surrounding environment.

The provisions of the convention regulate the handling of 21 chemicals listed in the annexes of the convention,
of which 12 are so-called "old" chemicals that have been in the convention since its adoption and
was included in the appendices of the convention at the fourth meeting of the convention parties held in May 2009
9 new chemicals at the conference.

The implementation plan focuses primarily on the so-called "senior" twelve POS.

By convention, POS are divided into three types:

ÿ **plant protection products:** aldrin, chlordane, DDT, dieldrin, endrin, heptachlor,
hexachlorobenzene (HCB), mirex and toxaphene;
ÿ **chemicals used in industry:** polychlorinated biphenyls (PCBs) and HCB;
ÿ **chemicals that are produced as a by-product or waste in the production process**
during disposal: polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated
dibenzofurans (PCDFs), PCBs and HCB.

On the basis of the annexes of the convention, the following requirements are set for the handling of chemicals:

• Prohibited production and use of chemicals listed **in Annex A ;**
• Limited production and use of chemicals listed **in Annex B ; • Annex C** the
amount of emissions from anthropogenic sources (incidental production).
determining the general directions of the best possible technique for reduction.

The list of POS according to the annexes of the convention is presented in chapter 3.

2. Implementation of the Convention in Estonia and responsibilities of authorities

The Ambient Air Protection Act, Waste Act, Chemicals Act, Environmental Monitoring Act, Public Health Act, Plant Protection Act and several others are related to the implementation of the Convention in Estonia.
other laws.

In the European Union, there is legislation regulating the management of persistent organic pollutants
Regulation (EC) No. 850/2004 of the European Parliament and of the Council on persistent organic pollutants
and amending Directive 79/117/EEC. This regulation contains provisions which
address the production, marketing and use of POS, inventory management and waste management
and measures to reduce the accidental release of POS into the environment. New POS's
handling is regulated by Commission Regulations (EU) No. 756/2010 and 757/2010 on permanent
on organic pollutants.

In Estonia, there is a general person responsible for the preparation of the national implementation plan of the convention
The Ministry of the Environment and the contact person is Reet Pruul, chief specialist of the ambient air
department (tel: +372-626-0731, reet.pruul@envir.ee)

Ministries have determined the implementation of the requirements of the Convention in various areas
contact persons (Table 2.1).

Table 2.1. Contact persons for the implementation of the Convention

Ministry	Contact person	Contact person's workplace	Contact person's phone and email address
Ministry of Social Affairs	Tatjana Chernyak	Department of Public Health chief specialist	Phone: +372-626-9152 tatjana.tsernjak@sm.ee;
Ministry of Agriculture	Evelyn Hillep	head of the plant protection office	Phone: +372-625-6502 evelin.hillep@agri.ee
Ministry of the Interior	Prit Laaniste	adviser of the rescue and crisis-regulation-policy department	Phone: +372-612-5135 priit.laaniste@siseministeerium.ee
Ministry of Finance	Gerlin On the bank	Tax and Customs Board customs control service chief specialist	Phone: +372-676-1787 gerlin.kallas@emta.ee
Economic and Ministry of Communications	Kristel Kõiv	internal market department quality infrastructure service chief specialist	Phone: +372-625-6474 kristel.koiv@mkm.ee

2.1 Tasks of ministries and their administrative areas in implementing the requirements of the convention

2.1.1 Ministry of the Environment

Ministry of the Environment (www.envir.ee) organizes the assessment of environmental impacts and risks within its competence in the field of chemical safety and coordinates the avoidance of environmental audit and management systems; develops and improves the hazardous waste management system; organizes the issuing of environmental permits and control of the quantities of sewage and pollutants; issues permits and licenses in cases prescribed by law and develops environmental norms.
In addition, the Ministry of the Environment organizes the maintenance and development of the environmental register and other databases in the area of governance and ensures the availability of data to the public.

Environmental Board (www.keskkonnaamet.ee) issues environmental permits in the cases and to the extent provided by law, which also reflect the handling, generation and release of POS into the environment.
With environmental permits, if necessary, companies are also required to carry out self-monitoring of POS.

the Environmental Information Center is the collection of environmental data, maintaining, processing, analyzing, disclosing data and reporting on the state of the environment in Estonia and the factors affecting it. (www.keskkonnainfo.ee) the field of activity of is

The Environmental Information Center is responsible for the technical operation of the Internet-based environmental permit information system1, which was launched in early 2002 , the purpose of which is to ensure the uniform processing of environmental permits, enabling the examination and analysis of environmental use based on valid environmental permits. The information system for environmental permits also provides information on companies and institutions that own transformers and capacitors containing PCBs (data on the number, location, brand and disposal deadline).
Data on POS are also reflected in the air pollution sources and waste information systems.

Environmental Inspection (www.kki.ee) implements the legal measures to prevent illegal activities and implement mandatory environmental protection measures; stops illegal activities that harm or threaten the environment, as well as legal activities related to the use of natural resources, if it endangers people's lives, health or property.

Monitoring of dangerous substances carried out in the administrative area of the Ministry of the Environment

Within the framework of the national environmental monitoring program launched by the Ministry of the Environment in 1993, monitoring of hazardous chemicals in the Estonian environment is carried out.

The task of the monitoring program is to monitor the levels of dangerous substances in inland water bodies, to assess the state of pollution in the water bodies and to localize problem areas in the water bodies, as well as to identify the levels of priority dangerous substances. In samples collected during oral monitoring2

[1] http://klis.envir.ee/klis
[2] http://eelis.ic.envir.ee:88/seireveeb/index.php?id=13&act=selected_subprogram&subact=TUTV&prog_id=-

the following dangerous substances are determined: lindane, DDT, aldrin, dieldrin, endrin, isodrin, HCB, 1,2-dichloroethane, trichloromethane (chloroform), trichlorethylene, tetrachloroethylene and carbon tetrachloride. In addition to these, PCBs, PAHs and heavy metals (Cu, Cd, Pb, Zn, Hg, Ni, Ba, Co, Mo) are determined in the samples.

Under two sub-programs of the environmental monitoring program3 : bioindicative assessment of heavy metal deposition and monitoring of ambient air quality, monitoring of hazardous substances in ambient air is also carried out. The ambient air program assesses precipitation chemistry, ambient air composition, and heavy metal deposition.

2.1.2 Ministry of Social Affairs

The Ministry of Social Affairs plays a leading role as a designer of health policy, including in the areas of environmental health risks, drinking water and chemical safety.

In 1999, **the Chemicals Information Center was established under the administration of the Ministry of Social Affairs,** which is now part of the Board of Health. **Health Board** (www.terviseamet.ee) tasks in the area of ensuring the safe handling of chemicals are stipulated in subsection 2 of § 7 of the Chemicals Act.
The Health Board carries out inspections regarding compliance with the requirements for the distribution of chemicals and detergents in wholesale and implements the European Union's chemicals policy, which is based on Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006, which deals with the registration, evaluation, authorization and restriction of chemicals (hereinafter REACH) (OJ L 396, 30.12.2006, p. 1-850). In addition, monitoring of indoor air and drinking water is part of the competence of the Board of Health in the field of environmental health.

The Labor Inspectorate (www.ti.ee) carries out supervision in the field of occupational health and safety, including checking compliance with legislation regulating the handling of chemicals in the said field.

The research and development institution **Tervise Arengu Instituut** (www.tai.ee) operates in the administrative area of the Ministry of Social Affairs, whose main goal is to contribute to the continuous development of the population's health and the permanent increase in the quality of life. The Health Development Institute helps implement health information, development activities and measures implemented based on the results of scientific research, and also conducts research based on the Estonian National Cancer Strategy 2007-20154.

It has been established to coordinate chemical safety work on the basis of Section 8 (1) of the Chemicals Act **The Chemical Safety Committee5 ,** whose tasks are:

1) analyze the current problems of chemical safety in the Republic of Estonia and Europe in the
Union; 2) make assessments and express an opinion on chemical safety policies and strategies in the Republic of Estonia and the European Union; 3)
make proposals to government agencies for the development and implementation of chemical safety strategies; 4) to
give assessments on chemical safety regulatory legislation and their drafts; 5) make proposals to the Minister of Social Affairs for conducting chemical safety studies, publications

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[3] http://eelis.ic.envir.ee:88/seireveeb/index.php?id=13&act=show_subprograms&subact=&prog_id=-1264982023 http://

[4] www2.tai.ee/teated/arenduskeskus/Vahistreegia/ Riiklik_vahistrategia_aastateks_2007_2015est.pdf Formation

[5] of the Commission Order No. 194 of the Government of the Republic of May 20, 2010

for issuing, organizing training and harmonizing terminology; 6) exchange information and make proposals for coordinating the activities of various institutions in the field of chemical safety.

2.1.3 Ministry of Agriculture

Ministry of Agriculture (www.agri.ee) the competence includes the organization of ensuring food safety and compliance; coordination and management of animal health and protection and plant health and protection activities.

The Board of Agriculture is an institution under the administration of the Ministry of Agriculture, whose fields of activity related to the Convention are the fields of plant health, plant protection and fertilizers.

The main activity of the Department of Plant Protection of the Agricultural Board6 is the admission of plant protection products to the market, the registration of plant protection products allowed on the market, the manufacturers and distributors of plant protection products, the importers and users of highly toxic plant protection products into Estonia, and the storage and distribution places of plant protection products, the supervision of the marketing and use of plant protection products and plant protection equipment in accordance with the provisions of the legislation regulating the field. The Agricultural Board is also tasked with the substantive organization of the issuance of plant protection certificates, the supervision of the plant protection inspectors of the centers, the organization of their training, the development of instructional materials and the evaluation of the appropriateness and effectiveness of the supervision performed by them.

Veterinary and Food Board (www.vet.agri.ee) organizes food and feed safety, and carries out national supervision over the fulfillment of these requirements, controls the content of pollutants in both local and imported food and feed, and performs monitoring in the following areas related to the Convention:

- monitoring of pollutants in animal food7 : heavy metals and organochlorine and organophosphorus compounds are determined, as well as drug residues;
- in non-animal food8 : polyaromatic hydrocarbons, pesticide residues, heavy metals are determined and **-** monitoring of
dioxins in food9 : the content of dioxins and dioxin-like PCBs is determined.

2.1.4 Ministry of the Interior

The Ministry of the Interior (www.siseministeerium.ee) is under the jurisdiction of crisis management and the organization of rescue operations. Fires, especially fires in landfills and chemical storage facilities, are an important source of POS emissions. The main task of the Ministry of the Interior related to the convention is the organization of fire prevention and rescue work, crisis management and the prevention of major accidents, which is practically carried out by **the Rescue Board** (www.rescue.ee). The Rescue Board also monitors the work of companies at risk of a major accident.

[6] http://www.pma.agri.ee/index.php?id=104&sub=132
[7] http://www.vet.agri.ee/?op=body&id=257
[8] http://www.vet.agri.ee /?op=body&id=477
[9] http://www.vet.agri.ee/?op=body&id=457

2.1.5 Ministry of Economic Affairs and Communications

Ministry of Economic Affairs and Communications (www.mkm.ee) in the field of governance, the implementation of the state's economic policy is related to the convention, coordination of the development of industry, trade, energy, housing, construction, transport; technological development and innovation and consumer protection.

Technical Supervision Board (www.tja.ee) the field of activity concerning the convention is increasing safety in the handling of dangerous chemicals, fuel gas equipment and installations. The Agency's task is, among other things, to carry out market surveillance of the safety of equipment and certain products in the field of dangerous chemicals and to find out the causes of an accident or accident.

Tarbijakaitseamet (www.tarbijakaitseamet.ee) deals with the inspection of compliance with retail sales requirements for dangerous chemicals and detergents, among other goods.

2.1.6 Ministry of Finance

Ministry of Finance (www.fin.ee) the Tax and Customs Board (www.mta.ee) belongs to the administrative area, who checks compliance with the requirements set for the export and import of chemicals at the border.

3. Overview of the use of persistent organic pollutants (POPs) in Estonia

The following table presents the chemicals listed in the annexes of the convention and the differences in their handling in Estonia.

Table 3.1. Use of dangerous substances covered by the Convention in Estonia

Name of the hazardous chemical	Import ban year In Estonia	Use in Estonia: years, amount of active ingredient used, etc. comments
1. Substances whose disposal is stipulated by the Stockholm Convention (Annex A)		
Aldrin CAS 309-00-2	26.01.1999	Never been used.
Chlorodecone CAS 143-50-0	26.01.1999	Never been used.
Dieldrin CAS 60-57-1	26.01.1999	Never been used.
Endrin CAS 72-20-8	26.01.1999	Never been used.

Name of the hazardous chemical	Import ban year In Estonia	Use in Estonia: years, amount of active ingredient used, etc. comments
Heptachlor CAS 76-44-8	26.01.1999	Never been used.
Chlordecone CAS 143-50-0	26.01.1999	Never been used.
Chlordane CAS 143-50-0	26.01.1999	Never been used.
No wonder CAS 2385-85-5	21.10.1967	Never been used.
Hexabromobiphenyl CAS 36355-01-8	21.10.1967	Never been used.
Toxaphene CAS 8001-35-2	21.10.1967	Name in Estonia: Polychlorocamphene 50%. Used 1967-1984. Total used active substance 10.65 t. No known stocks.
Hexachlorobenzene (HCB) CAS 118-74-1	26.01.1999	Period of use in Estonia 1970–1982. Amount of active ingredient used 3.99 t. No known stocks. equipment
Polychlorobiphenyls (PCBs) CAS 1336-36-3 and others		containing more than 5 dm3 PCBs must be disposed of by 31.12.2010.
Hexachlorocyclohexanes (alpha-HCH and beta-HCH) CAS 319-84-6; 319-85-7 Lindane (Gamma-HCH or hexachloran gamma-isomer), CAS 58-89-9	Banned in Estonia Name Added (25% mixture of HCH isomers) to the Convention Period of use 1957–1969. Not used in 2010 after 1987 . No known stocks.	in Estonia: hexachloran 21.10.1967. In Estonia, lindane has only been used in seed treatment. No known stocks. Products in which at least 99% are gamma isomers can be used in the treatment of seeds, soil, etc. In addition, Gamma-HCH has been used in Estonia until 1999 under the name gammahexane (the amount of the active ingredient used in 1975-1986 4.3t), tigam (1988-1991 0.5t), venturam (1977-1988 1.3t)
Chlordecone CAS 143-50-0	Added to the Convention in 2010 Added	
Hexabromodiphenyl ether (hexaBDE)	to the Convention	In use under the name octabromodiphenyl ethers.

Name of the hazardous chemical	The year of import ban in Estonia	Use in Estonia: years, amount of active ingredient used, etc. comments
Heptabromodiphenyl ether (heptaBDE) CAS 68631-49-2 207122-15-4 446255-22-7 207122-16-5	in 2010	
Pentachlorobenzene (PeCB) CAS 608-93-5	Added to the Convention in 2010 Added	
Hexabromobiphenyl CAS 36355-01-8	to the Convention in 2010 Added to the	
Tetrabromodiphenyl ether (tetraBDE) CAS 5436-43-1 Pentabromodiphenyl ether (pentaBDE) CAS 60348-60-9	Convention in 2010	In use under the name pentabromodiphenyl ether

Name of the hazardous chemical	Import ban year In Estonia	Use in Estonia: years, amount of active ingredient used, etc. comments
2. Substances whose use must be restricted in accordance with the Convention (Appendix B)		
DDT CAS 50-29-3	21.10.1967	In Estonia, DDT was used as a pesticide in the years 1957–1977, a total of 191.3 t of the active substance was used. No known stocks. Area of use permitted with an exception (Estonia has not applied for an exception) - for the treatment of malaria and encephalitis - as an intermediate product in the production of dicofol. DDT has not been used in Estonia to treat malaria and encephalitis. Dikofol is not produced in Estonia.
Perfluorooctanesulfonic acid and its added derivatives (PFOS) to the Convention CAS 1763-23-1 in 2010 Perfluorooctanesulfonyl fluoride (PFOS-F) CAS 307-35-7		
3. Substances that are formed accidentally and enter the environment from anthropogenic sources (Appendix C)		
Polychlorinated biphenyls (PCBs) unnecessary thermal and industrial processes.	A possible source is combustion, CAS 1336-36-3 and other by-product. No Continuous monitoring and reporting required.	
Polychlorinated dibenzo-p-dioxins and it is (PCDD/PCDF). to prohibit, the implementation	possible to develop measures of the necessary reduction	to completely reduce emissions of dibenzofurans measure to limit
Hexachlorobenzene (HCB) CAS 118-74-1	emissions.	
Pentachlorobenzene CAS 608-93-5		

The Act on Accession to the Persistent Organic Pollutants Protocol of the 1979 Convention on Long-Range Transboundary Air Pollution, which was adopted in Estonia in 2000, is closely related to POS pollution. The countries that joined the protocol undertook to take measures to eliminate the generation of POS and to reduce their release into the natural environment. In order to get an overview of POS contamination, the report "Persistent Organic Pollutants Reduction Action Plan 2006-2010" was prepared in 2005 at the request of the Ministry of the Environment. The report discussed the spread of POS both globally and regionally.

3.1 Use of organochlorine plant protection products in Estonia

Plant protection products began to be used more extensively in Estonia at the end of the 1950s. In 1957, 226 tons of them were used, mainly DDT and hexachloran, and to a small extent also cleaning preparations.

Since 1960, Estonia has kept accurate records of the use of plant protection products, including organochlorine plant protection products.

The ENSV Council of Ministers decree of October 21, 1967 banned the import of organochlorine plant protection products into Estonia from 1968.

Organochlorine plant protection products have never been produced in Estonia.

3.2 Polychlorinated biphenyls and PCBs and their use in Estonia

PCBs are polychlorinated biphenyls, polychlorinated terphenyls, monomethyltetrachlorodiphenylmethane, monomethyldichlorodiphenylmethane, monomethyldibromodiphenylmethane, and a mixture containing more than 0.005 percent by weight of any of the foregoing.

These chemicals were widely produced worldwide from the 1930s to the 1980s and have exceptional chemical stability and heat resistance, and as a result are widely used in electrical and hydraulic equipment and lubricants. PCBs are probable human carcinogens based on the IARC10 (International Agency for Research on Cancer) classification and can enter the human body through the respiratory and pharyngeal tracts or the skin.

PCBs have never been produced in Estonia, and equipment and products containing them were imported to Estonia mainly from the former USSR.

During the last ten years, three major research works have been carried out in Estonia, which deal with Equipment containing PCBs in Estonia:

1) "Aid to Estonia for the implementation of the EN PCB/ PCT disposal directive" was prepared in 2000 in cooperation between the Estonian Ministry of the Environment and the Danish Ministry of the Environment and Energy. This work highlighted problems related to PCBs in Estonia and laid the foundation for further inventory of equipment containing PCBs.

According to this study, it was estimated that the energy distribution systems of major Estonian companies may have had about 10,000 former Soviet Union KC-type capacitors, each of which contains 10-15 kg of insulating oil containing PCBs, and the total weight of oil containing PCBs in the capacitors was estimated to be up to 150 tons.

The owner had to inform the Information and Technology Center of the Ministry of the Environment about all equipment containing more than 5dm3 PCBs. The information received revealed that transformers containing PCBs are also used in Estonia.

[10] International Agency for Research on Cancer (IARC)

As a continuation of the study, the Information and Technology Center of the Ministry of the Environment was created in the years 2000-2001 A database of equipment containing PCBs that is part of the Environmental Permits Information System (KLIS), where they are also available to the public http://klis.envir.ee/klis/PCB/

2) In 2004, OÜ Eesti Keskonnauuringute Keskus carried out the work "Polychlorinated mapping of waste containing biphenyls and terphenyls. Phase I".

The study covered only the equipment at the disposal of Eesti Energia's main and distribution network. Together at the end of 2004, 859 PCB-containing devices were listed in Eesti Energia's main network and distribution network capacitor PCB containing oil with a total weight of 27.36 tons.

3) 11 ways of the study "Mapping of equipment and waste containing polychlorinated biphenyls II" *through 2005 SWECO Eesti AS.*

During the mapping of PCBs carried out by SWECO Eesti AS, 2,768 over 5 dm3 were identified equipment containing PCBs and it is estimated that these equipment contain 58,300 kg of PCBs oil.

The study also identified that product groups containing PCBs on the Estonian retail and wholesale market not for sale. Based on the experiences of Denmark and Sweden, information was collected on product groups to find out from the Estonian Chamber of Commerce and Industry and and economic from the Ministry of Communications and plastic windows, doors, lacquers, paints, electric motors, from producers and importers of generators, transformers and converters.

4. Reduction of POS and prohibition of their conscious production and in use

4.1 Production and use of organochlorine plant protection products

As already mentioned in chapter 3, the import of organochlorine plant protection products was banned to Estonia since 1968. The residue was allowed to be used under strict control.

January 26 can be counted as the final ban on organochlorine plant protection products 1999, when the Council's directive from December 21 was taken over by Regulation No. 36 of the Government of the Republic 1978 banning plant protection products containing certain active ingredients marketing and use.

There are no known stocks of organochlorine plant protection products in Estonia.

Recommendation

• When finding stocks of organochlorine plant protection products, they must be handled as dangerous as waste and deliver the find to the hazardous waste management company that has the right handle or dispose of organochlorine plant protection products.

[11] http://www.envir.ee/orb.aw/class=file/action=preview/id=1123475/PCB%2BII%2Betapp.pdf

4.2 Production and use of polychlorinated biphenyls

The requirements for handling waste containing polychlorinated biphenyls and polychlorinated terphenyls are established by the Minister of the Environment with his Regulation No. 25 of April 22, 2004 "Polychlorinated requirements for handling waste containing biphenyls and polychlorinated terphenyls". Regulation the scope and definitions are taken over from Council Directive 1996/59/EC polychlorinated on the disposal of biphenyls and polychlorinated terphenyls (PCB/PCT). Polychlorinated devices containing biphenyls and polychlorinated terphenyls (PCB/PCT) must comply accordingly to the mentioned regulations to remove or decontamination as soon as possible, but by the end of 2010 at the latest.

PCB disposal procedures

In accordance with Regulation No. 154 of the Government of the Republic of July 6, 2006 "Prohibited in problem products a detailed list of dangerous substances and prohibitions and restrictions imposed on problem products" no from 31.12.2010 no device containing more than 5 dm3 PCBs may be used in Estonia.

From the point of view of POS waste management, the most important is Article 7 paragraph 2 of Regulation (EU) No. 850/2004 of the European Parliament and of the Council on persistent organic pollutants, which states, that waste containing POS must be disposed of12 or recycled so that it contains POS is destroyed or irreversibly converted in such a way that residual waste and emissions do not would exhibit characteristics of persistent organic waste. The same is enumerated in Annex V, Part 1 of the Regulation Possible handling operations for POS waste and their codes. Only a few are allowed disposal operations such as:

- D9 physico-chemical processing;
- Incineration of D10 on land13;
- Incineration of R1 with energy recovery (use primarily as fuel or other energy source, excluding waste containing PCBs).

Unlike other POS, PCB waste must not be incinerated with a recycling operation coded R1, even though the result would be the same as a disposal operation coded D10. The basis of the exception is the PCB directive, which clearly states that PCB waste must be disposed of only in specific procedures and recycling R1 is not mentioned there.

Waste that consists of, contains or is contaminated by the substances listed in Annex IV of the aforementioned Parliament and Council Regulation 850/2004/EC must be handled without undue delay and in accordance with Part 1 of Annex V to the same Regulation, disposal and recovery operations, which may lead to the reuse, recycling of substances listed in Annex IV of the Regulation, recovery or reuse is prohibited.

805/2004/EC Part 2 of Annex V lists those wastes containing POS (e.g. in thermal residues created in processes and soil removed from contaminated land areas), in which case there is only persistent storage allowed:

[12] waste collection, sorting, transportation and processing, as well as waste storage and its disposal above or below ground and processing operations necessary for waste reuse, recycling or recycling

[13] As opposed to burning at sea, which is prohibited

— in safe, deep, underground layers of rocky soil,
— in salt mines or
— in hazardous waste burial sites (provided that the waste is solidified or stabilized, if technically possible, as required for the purpose of waste classification in subchapter 19 03 of Decision 2000/532/EC.

There is a hazardous waste burial site in Vaivara, where solidified butter can be stored stabilized hazardous waste.

A PCB-containing device is any device that contains or has contained PCBs (such as transformers, capacitors and containers containing residues of PCBs) and which are not decontamination.

Devices that are believed to contain or have contained PCBs will be dealt with as well as equipment containing PCBs, unless proven PCBs absence in devices.

When storing, preserving or handling equipment or waste containing PCBs, all necessary measures must be taken to avoid the risk of fire.

In the absence of technical possibilities for disposal of waste containing PCBs or decontamination of equipment containing PCBs in Estonia, their holder, taking into account the provisions of Chapter 9 of the Waste Act, must cooperate with waste handlers located in foreign countries to fulfill the restrictions established on the basis of § 27 of the Waste Act. are relevant options exists.

Since there were no hazardous waste incineration plants in Estonia until 2008, the hazardous waste was sent for destruction in 2001 to Finland (Ekokem 110.7 tons) and in 2007 to Germany (SAVA Sonderabfallverbrennungsanlagen GmbH 103.9 tons).

The requirements for establishing, using and closing a waste incineration plant and a co-incineration plant are: established by Regulation No. 66 of the Minister of the Environment of June 4, 2004.

Information about which Estonian companies can hand over waste containing PCBs and Which Estonian companies can dispose of them can be determined from the Waste Department of the Ministry of the Environment and the Environmental Board.

It is forbidden to burn waste oil whose PCB content has not been tested in an accredited laboratory in advance determined. Waste oil containing more than 50 mg/kg of PCBs must be handled in accordance with the handling requirements established for PCB waste. Old oil can be burned by the owner of the incinerator who has an environmental complex permit or a waste permit for burning waste and a hazardous waste management license.

Table 4.1 Distribution of waste containing PCBs based on the waste list14

Waste code	Name
13	WASTE OIL AND LIQUID FUEL (except edible oils and in sections 05, waste mentioned in 12 and 19)
13 01	Waste hydraulic oil
13 01 01*	Hydraulic oils containing PCBs
13 03	Used insulation and heat exchange oils
13 03 01*	Insulation and heat exchange oils containing PCBs
16	NAME WASTE NOT OTHERWISE SPECIFIED
16 01	Scrap vehicles from various traffic sectors (including mobile machinery) and waste generated during the dismantling of scrap vehicles and vehicle maintenance
16 01 09*	Parts containing PCBs
17	CONSTRUCTION AND DEMOLITION WASTE (INCLUDING CONTAMINATED LAND IN THE SOIL REMOVED FROM THE AREAS)
17 09	Other construction and demolition debris
17 09 02*	Construction and demolition waste containing PCBs (e.g. sealants containing PCBs, Resin-based floor coverings containing PCBs, containing PCBs glaze insulation, capacitors containing PCBs)

Recommendations

•Environmental inspection to continue the systematic inspection of PCBs and equipment contaminated with them decontamination control. If a device containing PCBs is detected during the inspection, then the owner must be required to immediately decommission the equipment.

•Check the decontamination labeling of equipment containing PCBs accordingly to Appendix 2 of Regulation No. 25 of April 22, 2004 of the Minister of the Environment.

• Check companies that dispose of PCBs, so that the destruction of waste containing PCBs meets all requirements.

•Check that all are applied when handling equipment or waste containing PCBs necessary measures to avoid the risk of fire.

• Pass through PCDD/Fs, PCBs and

Measurements of HCB emissions in soil, bottom sediments, aquatic life and vegetation.

[14] "The list of waste, including hazardous waste" is established by Regulation No. 102 of the Government of the Republic of April 6, 2004

5. Limitation of unintentional POS emissions

5.1 Sources of Inadvertent POSs

Two types of POS emission sources are distinguished: stationary sources and diffuse sources.

• *Stationary sources* are, for example, waste incineration, energy production, metallurgical processes.

• *Dispersed sources* are, for example, transport, household heating, fires.

While it is possible to control emissions of hazardous substances from stationary sources, it is very difficult to control emissions from diffuse sources. Therefore, in addition to direct measurements, calculated estimates are also used to determine unintentional POS emissions (dioxins, polychlorinated biphenyls and hexachlorobenzene).

Annex C of the Convention lists POPs from anthropogenic sources released into the environment from production. These include polychlorinated dibenzo-p-dioxins and dibenzofurans, hexachlorobenzene and polychlorinated biphenyls.

Annex C, Part II of the Convention lists possible industrial sources of POS, of which there are
Important for Estonia:

• waste incineration equipment, including co-incineration equipment for domestic, hazardous and medical waste or sewage
sludge; • cement kilns burning hazardous waste.

Part III of Annex C of the Convention presents possible non-industrial sources of POS, of which are important for Estonia:

• open burning of waste, including landfill fires; • residential heating
stoves; • combustion
devices that use fossil fuels as fuel; • wood and other biomass burning
devices; • crematoria; • motor vehicles; •
animal waste
handling plants; •
textile and leather dyeing and finishing; •
shredding equipment for recycling scrap vehicles; •
melting copper cables with a flame; • waste from waste oil
processing plants.

5.2 Reduction of unintentional POS emissions

of POSs, PCBs, dibenzo-p-dioxins (PCDDs), HCB and
dibenzofuran (PCDF), emissions can be reduced by the efficiency of combustion processes
by improving by ensuring a sufficiently high temperature and hazardous substances in industrial processes
by replacing with less dangerous substances.

Annex 1 presents the calculated emissions of PCDDs/PCDFs, PCBs and HCBs to the ambient air
in Estonia in the years 1990-2008.

5.2.1 Unintentionally generated POS emissions by year and measures to reduce them

5.2.1.1 Emissions of dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) outside air

Emissions of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) for the period
There has not been a significant decrease in the period 1990-2008. in 1990 (5.68 g-ITQ) and in 2008 (5.05
g-ITQ). The lowest emission was in 2006 (2.671 g-ITQ), but it is again later
considerably increased.

Table 5.1 Emissions of PCDDs and PCDFs (dioxins) in Estonia in 2004-2008 (g-ITQ)

	2004	**2005**	**2006**	**2007**	**2008**
Combustion in energy	0.65	0.56	0.45	1.87	2.26
Non-industrial incineration	1.55	1.78	1.32	1.64	1.7
Burning in the manufacturing industry	0.8	0.67	0.79	0.93	0.6
Road transport	0.06	0.06	0.06	0.06	0.05
Other mobile sources of pollution					0
Incineration of hospital waste	0	0	0	0	0.03
Incineration of industrial waste	0.5	0.09	0.04	0.04	0.43
Together	0.16 **3.72**	0.12 **3.28**	0.01 **2.67**	0.26 **4.79**	**5.07**

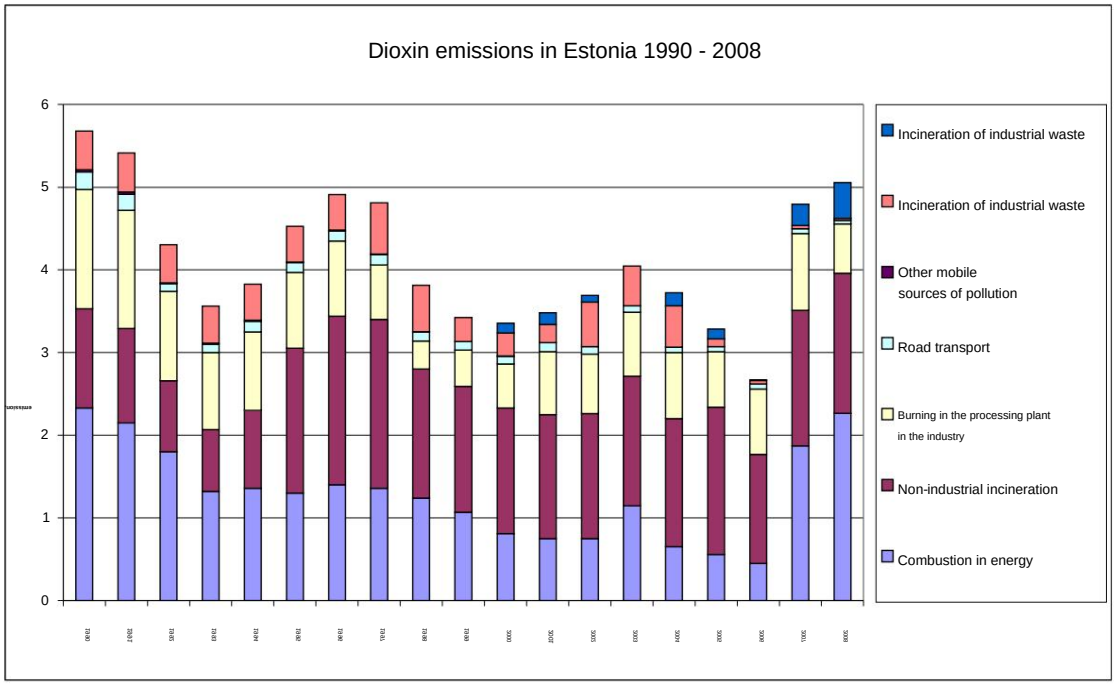

Figure 5.1 Dioxin emissions in Estonia in 1990 - 2008

• Possibilities and measures to reduce dioxin emissions

By 2007, dioxin emissions in Estonia had decreased by 15% compared to 1990 (Environmental overview, 2009). A 15% reduction is also confirmed by international calculations (Persistent Organic Pollutants in the Environment, 2010).

At the same time, in 2008 compared to 2006, there was a 45% increase in dioxin emissions in Estonia, which was due to the increase in burning in the energy sector. The intervening increase in dioxin emissions was caused by an increase in non-industrial incineration in the mid-1990s and an increase in incineration in the manufacturing industry in 2003.

65% of dioxin emissions in Estonia come from local sources - burning in energy, industry and industrial burning of waste. Reducing dioxin emissions is possible by improving the efficiency of incinerators and using industry best available techniques.

In order to reduce dioxin emissions, it is important to inform the population about the possibilities of reducing non-industrial emissions, especially the harmfulness of waste incineration. In order to avoid fires, it is also necessary to carry out systematic and effective preventive work.

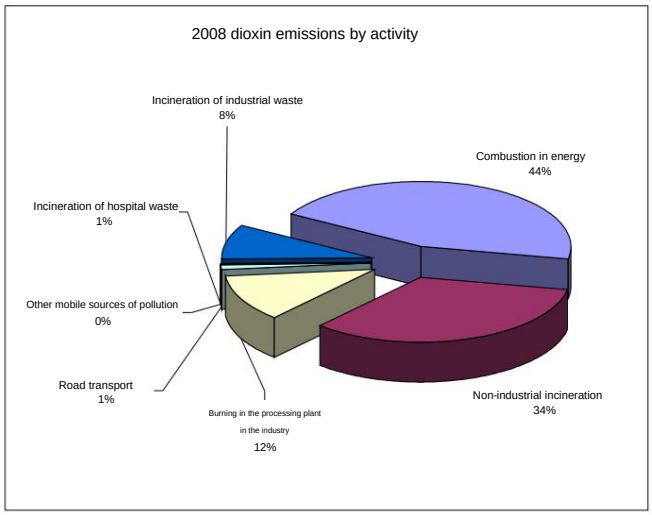

Figure 5.2 Dioxin emissions by activity

5.2.1.2 Emissions of hexachlorobenzene to outside air

Table 5.2. Hexachlorobenzene (HCB) emissions from burning fuels 2004-2008. a (kg/year)

	2004	**2005**	**2006**	**2007** 0.03	0.02	**2008**
Combustion in energy		0.03	0.02			0.021
Non-industrial burning	0.09	0.08	0.08	0.1		0.1
Burning in processing industry	0.04	0.04	0.02	0.01		0.023
Together	**0.16**	**0.15**	**0.12**	**0.13**		**0.144**

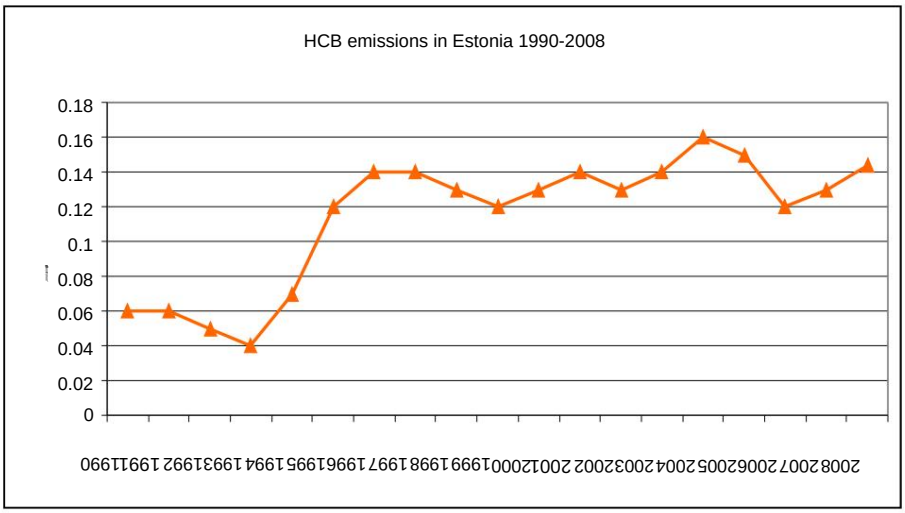

Figure 5.3. HCB emissions in Estonia in 1990-2008

• Possibilities and measures to reduce HCB emissions

Emissions of hexachlorobenzene in Estonia originate mainly from non-industrial burning (Fig 5.4), which are diffuse sources and there are no quick solutions to reduce these emissions.

It is important to inform the population about household waste burning
dangers and the importance of the maintenance of the heating hearths.

Since 31% of hexachlorobenzene emissions come from energy and processing industries, there is also enough potential in these areas for technology improvement, equipment maintenance, to reduce HCB emissions by using filters and implementing other measures.

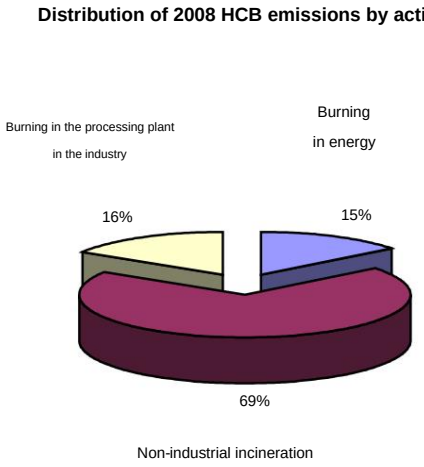

Figure 5.4 Distribution of HCB emissions in Estonia by activity areas in 2008

5.2.1.3 Emissions of polychlorinated biphenyls (PCBs) into ambient air

Emissions of polychlorinated biphenyls into the air decreased from 1990 (90,247 kg) to Until 1993 (57.019 kg). Since 1993, the quantities released into the air have remained constant relatively stable. Emissions were lowest in 2000, when PCBs were released (44.801 kg) and the highest in 2007 (57.3 kg). Emissions remain the same in the remaining years between these two quantities.

The change in emissions can be seen in figure 5.5 and table 5.3. The entire period the data can be found in Appendix 1.

Table 5.3 Emissions of PCBs into the outdoor air 2004 - 2008 (kg)

	2004 2005 2006 2007 45.1 50.4 6 6.4				**2008**
Combustion in energy		42.6	39.3		43.2
Non-industrial incineration		5.6	5.5		6,7
Burning in the processing plant in the industry	1.4	1.5		0.4	1
Transport (railway)			1		0
Together	0 **52.5**	0 **49.7**	0 **45.8**	0 **57.2**	**50.9**

PCB emissions in Estonia 1990 - 2008

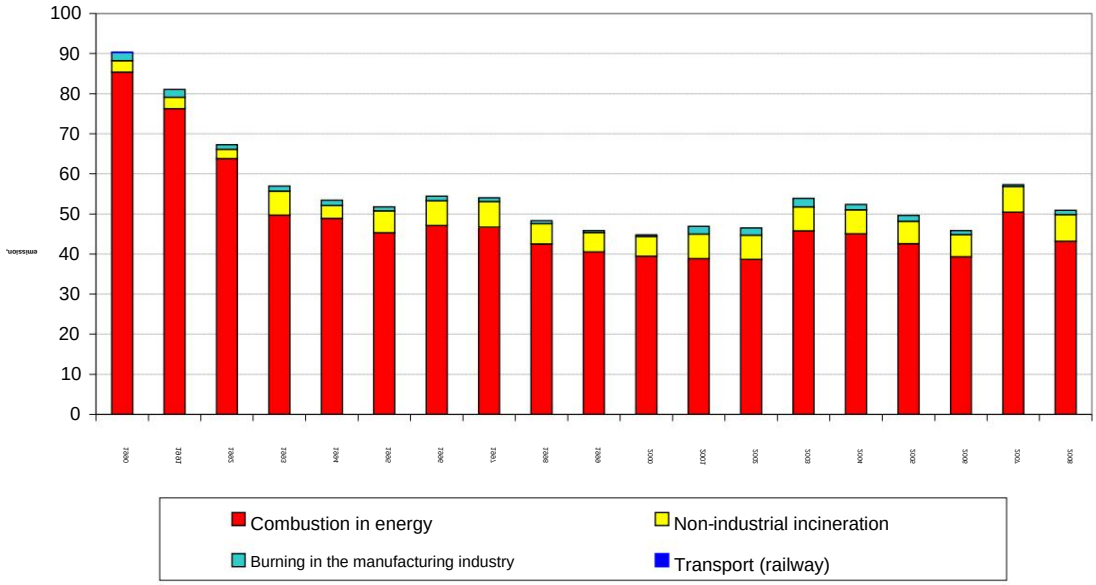

Figure 5.5. Emissions of PCBs in Estonia in 1990-2008

• Possibilities and measures to reduce PCB emissions

The largest share of PCB emissions comes from combustion in the energy sector, accounting for 85% of total emissions.

These are localized emissions, and technologies need to be improved to reduce them.

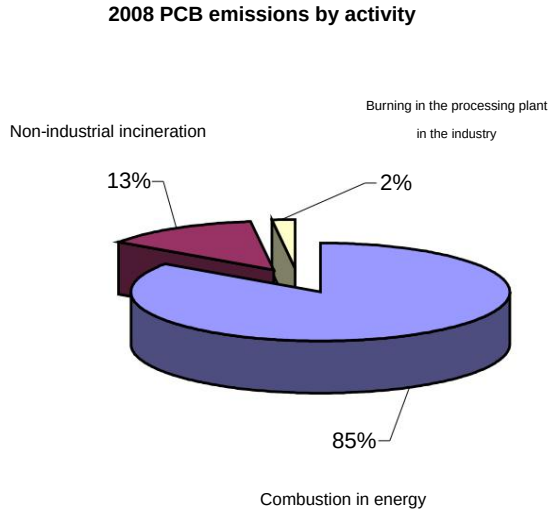

Figure 5.6. PCB emissions by sector

The data on emissions of pollutants to the outside air discussed in point 5.2 are in the form of tables presented by sector in Appendix 1.

5.2.2 General measures and obligations to reduce emissions

To reduce POS, it is necessary to follow the principles of avoiding pollution complexes. Subjects are transferable in the environment - fall from the air into the soil and water, leach from the soil into the water etc. It is important to map and model the movement of substances between different environments so that find optimal solutions in which part of the environment is best to avoid them and eliminate.

One of the measures to reduce POS is the control of the cross-border movement of goods, so that we products, the handling of which may release POS into the environment, would not enter the market. POS containing products are problem products that the waste causes or can cause health or environmental hazards, environmental disturbances or excessive pollution of the environment. The handling, import and control of problem products are regulated by legislation.

It must be ensured that the control procedures are in accordance with the European Parliament and the Council with Regulation 765/2008/EC, which stipulates the requirements regarding the marketing of products.

5.2.2.1 Reduction of POSs in ambient air

The points of origin of POS emissions that are unintentionally generated in the outdoor air are stationary sources and thus are it is possible to reduce POS emissions to a certain extent by applying appropriate methods.

Reducing POS emissions in the energy and industrial sectors

Based on the Estonian fuel and energy economy development plan, it must be ensured on the basis of oil shale increasing the efficiency of electricity production at the same time as significantly reducing the harmful environmental impact reduction by updating combustion technology. At the same time, there are new technologies implementation, improvement of equipment efficiency and heat and electricity losses reduction very extensive and costly measures.

Replacing fossil fuels with biofuels reduces the production of greenhouse gases because CO2 formed during combustion goes back into the biocycle, on the other hand, it increases wood and the burning of wood waste sharply releases PAHs.

An alternative is to refurbish combustion equipment and heat distribution systems to ensure efficient use of fuels and reduce energy losses.

Reducing household emissions from POS

In the household, it is necessary to improve or renew the correct use of fuel heating devices and finish with various household waste and chemicals containing POS uncontrolled burning of treated wood both in fireplaces and outdoors. Household waste generation is also caused by the burning of household waste.

Reduction of POS emissions in waste management

In order to reduce emissions from POS, the collection and sorting of combustible waste must be improved.

Waste may be burned only in waste designed or adapted for this purpose and in incinerators with a waste incineration permit. Containing organochlorine compounds waste must not be burned in incinerators with an uncontrolled temperature regime separately or mixed with other fuels. In small incinerators where the temperature field is in the hearth uneven, waste incineration is inappropriate because in the low temperature zone (below 850°C) a particularly large amount of PCDD/PCDF compounds is produced.

Uncontrolled burning of transformer and capacitor oils containing PCBs is prohibited. Solid waste, harvest waste and waste incineration and others in order to avoid uncontrolled combustion processes, it is necessary to tighten up on those who cause them penalties to be imposed.

Forest and peatland fires can be prevented by taking precautions.

Directive 2001/81/EC of the European Parliament and of the Council, national regulations for certain air pollutants on ceilings, (hereinafter NEC15[1] directive) aims to limit acidifying and emissions of eutrophicating pollutants and ozone precursors in order to improve the environment and protection of human health in connection with acidification, soil eutrophication and tropospheric ozone from the danger arising from harmful effects and to move towards long-term goals not to exceed them critical pollution levels and loads and effectively protect all people from air pollution for potential health risks by establishing national emission ceilings. NEC on the basis of the directive, maximum limits for pollutants have not yet been established for Estonia.

[15] National Emissions Ceilings

According to the POS protocol of the Geneva Convention, the dioxins valid in Estonia are domestic maximum 3.46 g I-TEQ. 2004 has been taken as the base year for pollutant emissions.

Remote emissions reduction and improved monitoring of POSs

Emissions from remotely imported POS can only be reduced in cooperation with other countries. There are currently no permanent POS monitoring stations in Estonia, so the only option is to compress cooperation with the EMEP West and East Centers, which deal with the annual air pollution modeling in Europe. It must be observed whether air pollution is decreasing or increasing primarily in countries from which pollutants are imported into Estonia.

Reduction of POS emissions in uncontrolled processes

Uncontrolled POS emissions are primarily caused by forest fires, waste fires and other such cases. It is forbidden to burn waste in Estonia. The fire season begins in the spring after the snow melts and ends with the arrival of rainy weather in autumn. At this time it is flammable smoking, bonfires, logging waste or other debris, including flammable household items, are prohibited in the area burning of industrial waste, dried vegetation, waste, straw, etc.

5.2.2.2 Reduction of POSs in soil

The implementation of measures to reduce soil pollution is underway in Estonia. It has been changed several pieces of legislation to create a legal basis for preventing soil pollution with hazardous substances.

By Regulation No. 38 of the Minister of the Environment of August 11, 2010 "Content of hazardous substances limit values in soil" established limit values for the content of hazardous substances in soil, soil for assessing the condition and planning measures to improve the condition of the soil and for implementation.

The cleaning of residual pollution areas has been done so far and the work will continue in the future. more precise an overview of contaminated sites is presented in Chapter 7.

To plan soil monitoring, it is necessary to model the distribution paths of airborne POS and determine the monitoring points in such a way that they take into account the nature of the generated substances and how far from the place of origin they are carried by air before falling down.

Work in this area is ongoing and additional studies have also been started.

5.2.2.3 Reduction of POS in the aquatic environment

POS are persistent in the aquatic environment, they settle in bottom sediments and bioaccumulate, accumulate in biota and enter the food chain from there.

In order to evaluate POSs in water, their determination in water alone is not sufficient, in addition, it is necessary POSs can also be determined from bottom sediments and biota.

In the case of the aquatic environment, the combined effect of various pollutants on organisms must also be taken into account. For the effective protection of the aquatic environment, it is necessary to implement complex studies and measures that take into account the combined effect on aquatic life. The actual condition of water bodies and

More and more toxicological studies are being applied to assess the effects of poisonous substances, which would be desirable to be applied to the study of Estonian water bodies as well.

Legislation on hazardous substances has been significantly supplemented and updated in recent years in order to ensure a better legal basis for the protection of the aquatic environment. The Water Act and related regulations have been amended. The regulations of the Minister of the Environment established environmental quality limit values for hazardous substances in groundwater16 and surface water17 with the aim of detecting pollution and planning measures to improve the condition of groundwater and surface water.

Recommendations

• Investigate the causes of hazardous substances entering the environment and implement corresponding reduction measures.

• To carry out an assessment of the generation of POS in areas that are still not covered (e.g. household heating stoves).

• Continue direct measurements of POS emissions in companies that have combustion equipment (boiler houses and other larger combustion equipment).

• Ensure the consistency of the data provided on POS emissions and the implementation of appropriate reduction measures based on them.

• Model the arrival of air-borne POS in soil and water and plan soil and water environment monitoring according to the obtained results.

• Engage in fire prevention (landfills, waste storage sites, forests, etc.).

• Prepare a national monitoring plan for the analysis of POS in the soil and aquatic environment (sediments and biota), including relevant *in vitro* toxicological studies.

• Continue to clean up residual pollution areas.

• Inform the population about the dangers to health arising from the burning of household waste.

• Continue to identify products containing POS and actively monitor the compliance of the handling of problem products with current requirements.

[16] Regulation No. 39 of the Minister of the Environment of August 11, 2010 "Groundwater quality limit values for hazardous substances"

[17] Regulation No. 49 of the Minister of the Environment of September 9, 2010 "Environmental quality limit values for hazardous substances in surface water, including priority substances and priority hazardous substances and certain other pollutants, methods of application of environmental quality limit values for priority substances and priority hazardous substances in surface water"

6. Limitation of Landfills and Waste and Related POS Emissions

In the years 2004–2007, changes took place in the field of waste due to the accession of Estonia with the European Union. The new Waste Act, the Packaging Act and those established on the basis of them came into force regulations.

The strategic goals of the waste sector are based on the general goals of the European Union and Estonia of environmental policy, where the main goal of waste policy is to prevent and promote waste generation recovery, including reuse and recycling.

In 2008, the Government of the Republic approved the waste plan, which determines the general principles of waste management development trends until 2013.

All substances in the annexes of the Convention and products containing them, so-called problem products, can be treated as hazardous waste. Producer responsibility, i.e. the "polluter pays" principle, is applied to problematic products, according to which the manufacturer or importer of the product must ensure that collection, recycling of waste from problem products placed on the market by reuse or disposal.

6.1 Landfills

Landfills are one of the important sources of POSs entering the environment. A study is underway in Estonia COHIBA 2008-2012, during which different POSs are determined from landfills.

Landfills continuously pollute soil and water due to rainwater leaching. In addition, soil and for water pollution, landfills are the biggest source of POS in case of fires, because a lot of different materials, including halogen-containing waste, burn in bulk at low temperatures.

Preventing fires in landfills is therefore extremely important in reducing POS.

It is also necessary to implement measures for the re-entry into the environment of POSs deposited in landfills to prevent landfill leachate collection and treatment, closed landfills with supervision over etc.

According to the results obtained from the studies, it is necessary to revise the landfill monitoring programs and switch POS monitoring to new landfill monitoring. It is also necessary to review all already closed landfill monitoring plans and treat them as residual pollution areas.

Recommendations

- Increase awareness and enhance monitoring in order to significantly reduce emissions from landfills to the number of POSs and thus to the number of POSs created throughout Estonia.
- In case of large fires, conduct air and water surveys, including measurements of POS content.

Model the distribution of POS in air and water environments.

• Inform people at risk about possible dangers in the event of a landfill fire quickly and adequately.

• Continue to inform people about the need to sort waste, improve waste management collection system, making it more user-friendly and economically accessible.

• To improve the supervision of companies regarding the correct handling of waste.

• Determine the POS content of sewage sludge before depositing it in a landfill.

•Take measures to prevent POSs deposited in landfills from re-entering the environment.

6.2 Waste

Waste containing substances regulated by the Convention is classified as hazardous waste.
The classification of waste as hazardous waste is carried out in the category of hazardous waste on the basis of the classification procedure18 according to the amount, origin, composition, hazardous waste to the content of substances.

6.2.1 Construction material waste

The building materials used are potential sources of hazardous substances. Today there are dangerous ones the use of substances in the production of construction materials is prohibited, but pollution from previously used materials may reach the environment during reconstruction and demolition works. Based on this, the awareness of building material handlers must be raised.

It is also necessary to collect construction waste from the population with its better organization.

Special attention must be paid to wood treated with chemicals containing POS, assembly foams, sealing materials, insulation materials, fireproofing materials and floor covering materials.

6.2.2 Waste from car scrapping

The activities of companies related to car scrapping are sufficiently regulated by law, but it is also necessary to continuously inform the general population about possible pollution from car parts to avoid

NB! The resulting oil waste should be considered separately.

6.2.3 Electronic waste

[18] Regulation No. 103 of the Government of the Republic of April 6, 2004 "Procedure for classifying waste as hazardous waste"

Since August 13, 2005, a procedure has been established for electronic waste from consumers for collection and return to manufacturers. 19. Such a collection system helps to avoid the inclusion of electronic waste in general waste.

Consumers must continue to be informed about hazardous substances originating from electronic products and the need to handle electronic waste as hazardous waste.

In order to prevent the importation of electronic devices containing POS, they must be checked according to the legislation established for problem products.

In order to inform entrepreneurs, the Ministry of Environment has issued a publication,20 which is intended primarily for entrepreneurs who are subject to the obligation of producer responsibility. I'm busy requirements of the legislation on electronic scrap and scrap vehicles with instructional material for fulfillment.

6.2.4 Products containing dangerous substances in daily use generated waste, plastic packaging, wires, batteries, etc.

To reduce exposure to hazardous substances in everyday use by raising awareness to regular landfills.
To improve and simplify the options for the population to collect hazardous waste.

6.2.5 Sewage sludge generated in water treatment systems

Sewage sludge is one of the sources of POSs re-entering the environment. From scattered sources POSs originating from urbanized areas often end up in sewage sludge, the sediment is biological recycling, in turn, returns them to the soil.
By upgrading sediment handling technologies, it is possible to reduce the amount of POS and prevent their return to nature.

6.2.6 Proper storage of waste containing POS by waste handlers by

Proper storage of waste containing POS by waste handlers is also very important by, so that these substances do not leak into the soil and groundwater or cause a fire that would pollute air with POS as well.

[19] Regulation No. 65 of the Government of the Republic of April 20, 2009 "Emerged from electrical and electronic equipment requirements and procedures for collecting waste, returning it to the manufacturer, and reusing or disposing of it, as well as target numbers and target numbers deadlines for achievement"

[20] Printed at www.envir.ee/108277

Recommendations

• Prevent waste from entering nature.

• To inform the public about the danger of construction material residues containing POS - assembly foams, insulating materials, sealing materials, fire barrier and floor covering materials. To enhance their controlled collection.

• Ensure that the waste generated in companies involved in car scrapping and tire changing are handled in accordance with the stipulated requirements.

• Check the compliance of the activities of companies handling waste oils with the legislation requirements[21] .

• Check the proper storage of POS waste by waste handlers by turning the large attention to fire prevention.

• Raising the population's awareness of hazardous waste (electronic devices, energy saving bulbs, car parts, batteries, waste oil, etc.) from collection options.

• Simplify hazardous waste collection options for the population.

[21] Regulation No. 23 of the Minister of the Environment of April 21, 2004 "Requirements for waste oil handling"

7. Contaminated areas and related activities

7.1 Residual pollution objects of the Soviet military

Research on residual pollution carried out in Estonia in the nineties was primarily related to the pollution caused by the former Soviet Union's military and its elimination.
The Soviet army held 1.9% of the territory of Estonia, where civil authority did not reach and where there was no overview of the state of the environment. According to the aforementioned studies, the damage caused to the environment amounted to 4 billion dollars.

A particularly large pollution of the environment by foreign forces occurred just before the departure of the Soviet army from Estonia in 1994.

The elimination of residual pollution was financed from the state budget, but help was also received from several foreign countries, especially Denmark, Finland, Sweden, Germany, etc.

Land areas of former military airfields (Tapa, Rakvere, Raadi, Ämari, etc.) have been polluted mainly by oil products. At the missile bases (Keila-Joa, Raadi, etc.) the land area was polluted with samine.

The areas of both military airfields and missile bases are extensive, but due to the implemented measures (pumping out of polluted groundwater, liquidation of polluted soil), the pollution hotspots are no longer expanding.

It is important to continue periodic monitoring of major pollution hotspots.

7.2 Residual pollution objects of industrial areas

Among industrial areas, a serious problem is the old asphalt concrete factories that have not been repaired so far.
There are more than 30 of them in the list of residual pollution hotspots22. The main source of danger is the oil waste in the disintegrating tanks, the spillage of which would pollute the surrounding groundwater and surface water bodies. Until now, there are untidy tank parks in several boiler houses (for example, Paldiski) and fuel storage facilities (for example, Võru oil terminal, Tapa Veduri- and Vagunidepoo). As soon as possible, the residues of unused oil products from tank farms and asphalt concrete plants must be eliminated.

Groundwater in several square kilometers around the oil industries and waste mountains in northeastern Estonia is polluted with oil shale oil and phenols. The aquifer close to the surface is polluted with shale oil products, in some places the pollution has also spread to the Ordovician-Cambrian aquifer.
Pollution of surface water and groundwater continues in the Kohtla-Järve industrial area, the phenol-polluted waters of the fuss storage facility, the semi-coke deposit and the production area are still dangerous. The SA Environmental Investment Center (KIK) has made a funding decision to close the Kiviõli oil shale industry hazardous waste landfill that does not meet environmental requirements and the Kohtla-Järve oil shale industry semi-coke landfill. The estimated cost of closing the landfills is approximately 30 million euros. The Kohtla-Järve and Kiviõli semi-coke deposits must be liquidated by 2013.

[22] http://www.envir.ee/1119

The data of the determined residual pollution areas have been collected in the corresponding register23 and these areas cleaned as possible.

7.3 Ensuring effective elimination of residual pollution

As a result of the work of the Ministry of Environment, the Government of the Republic was approved in July 2009 with the order "Living environment development implementation plan" of the priority direction "Water management and development of waste management infrastructure" investment plan of the measure "Ice pollution elimination in former military and industrial areas" for the years 2009-2013.

Within the framework of the investment plan, it is planned to eliminate pollution in ten areas in 2009-2013 at the residual pollution site of national importance - Kose-Rist asphalt concrete plant, Kose boiler house, Tallinn-Vaike veduridepoo, Tapa veduridepoo, Tapa vagunidepoo; Miinisadam, Systa tn sa-dam; Ahtme 86 asphalt concrete plant, Narva asphalt concrete plant and Eesti Raudtee Kopli freight station.

The liquidation of residual pollution objects is financed from the funds of the Cohesion Fund approximately 15 with a million euros.

Investment plan of the measure "Ice pollution elimination in former military and industrial areas". four new projects were added to the list for 2009-2013 in July 2010, which include four remediation of the polluted territory of the former asphalt concrete plant in Umbsaari, Holstre-Nõmme, In Viruvere and Põltsamaa.

In addition to the funds of the Cohesion Fund, the liquidation of residual pollution objects is carried out continuously KIK environmental program. From the residual pollution sub-programme of the environmental program the liquidation of residual pollution objects, which are included in the environmental register, is financed TOP-75 of the list of registered residual pollution objects or is listed in the sub-basin in water management plans.

In the case of localization, liquidation and re-use of residual pollution hotspots, apply definite rules. When liquidating a residual pollution object, the first requirement is residual pollution hotbeds inventory and prompt cleanup of abandoned hazardous waste. It must then be liquidated or bring facilities into compliance with environmental requirements (container parks, pipelines, chemical warehouses). As a priority, measures must be implemented to ensure the availability of clean drinking water to people living in the area. The completion of the aforementioned works will be followed by soil and mapping of the extent of groundwater pollution, assessment of the necessity of cleaning works and, if necessary cleaning work. The simplest method of cleaning the soil is to remove the polluted soil and handling in a company specialized for this purpose in accordance with permitted waste management operations.

It is necessary to improve the supervision of the effectiveness of the elimination of residual pollution and organize it provisions of existing legislation. It is necessary to stipulate the rights and obligations of landowners when using a contaminated area.

The basis for evaluating the effectiveness of cleaning residual pollution areas must be real measurements. It must also be checked that appropriate disposal procedures are used so that not to cause contamination of other environments with POSs that may arise during cleaning.

[23] http://register.keskkonnainfo.ee/envreg/main#HTTPHF1JTZMFdDBFPmB1Eqo0xULgm9Px38

In the light of the changed legislation and improved knowledge, it would be necessary to carry out a follow-up check of the content of POS in previously cleaned areas (e.g. military facilities).

Recommendations

• Continue the mapping of POS-contaminated areas and soil chemical analyzes of POS-contaminated areas.

• Carry out removal of contaminated soil in POS-polluted areas and disposal of contaminated soil in accordance with permitted waste operations.

• To evaluate the efficiency of pollution elimination in the residual pollution areas that have already been cleaned and the compliance with the requirements based on specific measurements.

• The dangers arising from residual pollution must be taken into account when preparing plans

8. Limiting and related to the production and use of new POS activities

Article 3 of the Convention obliges parties to prevent new persistent organic pollutants production, distribution and use.

This obligation is also stipulated in Regulation 850/2004/EC of the European Parliament and of the Council about persistent organic pollutants in article 3 "Production, marketing and use control".

In the development and adoption of legislation on new chemicals and plant protection products must be based on the requirements set out in Annex D of the Convention.

The Convention recognizes and encourages developments that result in the reduction of POSs distribution and impact on the environment. The convention encourages development and use alternative chemicals that would be less dangerous.

9. Necessity of a register of possible exceptions

In Estonia, it is not necessary to apply for entry in the register of specific exceptions of Annexes A and B, which is necessary for the production or use of these substances, because these substances are not produced or used in Estonia to use.

10. Effects of POS on human and animal health

Impact on people

Because POSs are persistent and bioaccumulate in the body, they are primarily associated with chronic effects. POSs can damage the human immune, nervous, endocrine and reproductive systems, and some POSs can cause tumors in humans.

POSs enter the human body mainly through food. POSs are the most common in foods rich in fat, i.e. meat, fish and dairy products. For example, the fat-rich Baltic Sea fish such as herring and salmon contain dioxins, so eating these fish has been recommended limit. In some Baltic Sea countries, it is forbidden to use cod liver for food, because there significantly accumulates toxins, including PCBs.

Many countries and international organizations have established several health risks criteria such as the highest acceptable daily dose of a pollutant that should not cause a health risk in healthy people (ADI - *acceptable daily intake).*

It is believed that the higher risk of breast cancer found in women from Baltic Sea countries due to the high content of POS in Baltic Sea fish (Rylander et al., 1995).

Fish consumption should take into account the overall effect of the relevant contaminants in the diet, while also relying on national consumption habits. Fish is known to be good omega-3

source of fatty acids. It is recommended to consume 1-2 portions of fish (a portion is about 130 g) per week.

Exposure of children to POS before the age of two can cause brain stunting. It is also believed that the decrease in birth weight of babies (especially boys) is due to the high content of POS in Baltic Sea fish (Rylander, Hagmar, 1995). POSs cross the placental barrier and are excreted in breast milk, therefore fetuses and nursing infants are also at risk from POSs (WFPHA24, 2000; Ritter et al., 1995).

People who work and/or live in close proximity to sources of POS are also exposed to POS through the air and skin.

Of the pesticides covered by the Convention, endrin has the highest acute toxicity, while heptachlor and HCB are less toxic (Mörner et al., 2002). The acute effect manifests itself primarily on the central nervous system, the liver and can also result in death.

Effects on animals

Researchers have found that in birds of prey, marine mammals (seals, dolphins, whales, etc.) and experimental animals (rodents) used in research, POSs cause tumors, increased mortality, disorders in the immune, endocrine and nervous systems, and reproduction. This can lead to population declines in the wild.

For example, environmental toxins accumulating in the food chain, including DDT, have caused a decrease in the number of sea eagle offspring nesting in the Baltic Sea region. This is related to the harmful effects of DDT on calcium metabolism, resulting in thinning of the eggshell.

In mink and ferret, exposure to PCBs has been shown to cause immunosuppression, reproductive disorders, malformations and increased mortality [Ritter et al, 1995]. It is believed that PCB substances are one of the important reasons for the decline of several European mink populations since the 1950s.

In fish (perch, pike, cod, salmon, etc.) too, POS disrupts reproduction and hormonal balance (causes alterations between the sexes, changes in the reproductive organs, inhibits spawning in females, slows down sexual development, etc.) [UNEP, 2003].

Monitoring of certain POSs in the Estonian environment has been carried out within the framework of the national environmental monitoring program since 1994. The corresponding reports are available on the website of the Environmental Information Center of the Ministry of the Environment (http://eelis.ic.envir.ee:88/seireveeb/).

Monitoring of POSs from the human organism

When the monitoring of dangerous substances in Estonian food (PCDD/Fd, DL-PCBs, PCBs and other POS) in the Ministry of Agriculture and the Veterinary and Food Administration started in the late 1990s (corresponding reports have been available on the Internet since 200225), so far little has been done with breast milk and blood tests in Estonia.

Although POS levels in breast milk and blood are health indicators for POS research in Europe,

[24] World Federation of Public Health Associations

[25] respectively http://www.agri.ee/uuringud-statistika/) and http://www.vet.agri.ee/ ? op=body&id=457)

Estonia has not participated in international programs in this field.

Studies of Estonian POS in breast milk date back decades (Lutsoja, Tamm,
1969; Uibo et al., 1975; Sweden 1986, 1999; Holoubek et al., 2001). Obtained analysis results
it is not possible to compare with contemporaries, because there was a change in the nineties
cardinally POS analysis apparatus and determination methodology.

So far, the Estonian data gap has been filled by individual blood tests, in which the content of POS has been
determined (Bad Blood, 2002 - www.panda.org/detox), by GREENPEACE.
In the early nineties, six collected from Tartu and Tallinn in Finland were analyzed
the content of POS in the breast milk sample (Table 10.1).

Table.10.1.PCDD/F contents in breast milk 1986-1991 (pg I-TEQ/g of fat)
(Mussalo, Lindström, 1995)

Estonia 1991	Finland 1986-1987	Sweden 1987	Norway 1987
13.5 - 21.4	16.0 - 17.9	20.8 - 23.8	14.9 - 20.4

The breast milk samples taken from Tallinn contained polychlorinated dibenzo-p-dioxins (PCDD) and
the contents of polychlorinated dibenzofurans (PCDF) are lower than in the samples collected from Tartu
(13.3 and 21.4 ng TEQ Nordic/kg fat, respectively). With such a small number of subjects, no
however, general conclusions can be drawn.

In Estonia, it is necessary to develop a national monitoring plan to assess the impact of POS on human health,
by carrying out periodic examinations of both breast milk and blood.

In parallel with the second WHO breast milk surveillance program involving 19 countries, samples were also taken
from two regions of Estonia, PCDD, PCDF and the so-called "marker for polychlorinated biphenyls (PCB)"
(Table 10.2).

Table 10.2. Total dioxins (PCDDs and PCDFs) and the marker polychlorinated biphenyls (sum of PCB 28, 52, 101, 138, 180) contents of European countries in the breast milk of urban women in 1993 (Tuomisto & Hagmar, 1999)

Sampling Region	PCDD/F pgTEQ/g fat	Marker PCB pgTEQ/g fat
Austria	10.7	381
Belgium	26.6	261
Canada	13.4	137
Croatia	13.5	220
Czech Republic	18.4	1069
Denmark	15.2	209
Finland	21.5	189
Germany	16.5	375
Hungary	8.5	61
Lithuania	13.3	322
The Netherlands	22.4	253
Norway	10.1	273
Russia	15.2	197
Russia (St. Petersburg)	16.4	190
Slovakia	15.1	1015
Spain	25.5	452
Ukraine	13.3	191
England	17.9	130
Estonia	**14.4**	**103**

The concentrations of total dioxins (PCDD; PCDF) in Estonian women's breast milk were respectively 12.4 pgTEQ/g fat in rural samples and 14.4 pgTEQ/g fat from samples taken in the urban area. Marker-polychlorinated biphenyls (PCB 28, 52, 101, 138, 180 sum) contents, but 136 pg/g of fat in rural areas and 103 pg/g of fat in the urban area.

In order to protect human health, the content of POS in imported baby food and in fish oil. For example, one out of two samples of fish oil imported from Russia contained dangerous substances content above the limit value established by the European Union and in the second sample a little below the limit value (Roots 2007; Roots et al., 2008). For comparison, the analyzed fish oil imported from Norway had the content of dangerous substances is ten times lower.

Recommendations

• Carry out periodic monitoring of the content of POS in people's blood and breast milk in order to assess the real effects of POS on the health of the Estonian population.

• Continue monitoring of POS contained in raw food and prepared food, especially imported food and dietary supplements (fish oil).

• Continue raising the population's awareness of the dangers to their health arising from environmental pollution

•Inform the population about the recommended amount of consumption of herring and salmon from the Baltic Sea.

11. Monitoring of the content of POS in the environment

In Estonia, systematic monitoring of POSs (Roots, 1992, 1996) and heavy metals (Jankovski, et al., 1996) in the Baltic Sea began in the mid-1970s. The content of POS in seawater, plankton, fish, benthic animals, plants, etc. was monitored. The obtained results were used for the first time in assessing the risk of POS for the Estonian population (Roots, 1999).

The development of the Estonian national environmental monitoring program was started in the Ministry of the Environment in 1993 (Roots, Saare, 1996). On the basis of the developed program, a fairly good overview of Estonia's environmental condition and its pain points has been obtained by now.

Monitoring data has been available to the public through the monitoring publications of the Information and Technology Center of the Ministry of the Environment (Environmental Information Center since April 2010), Eesti Keskonnauuringute Keskus OÜ and the University of Tartu: Keskkonnaseire 1994; 1995; Estonian Environmental Monitoring 1996; Estonian National Monitoring of Nature Diversity, 2000; Estonian Environmental Monitoring 2001; 2003; Hazardous substances in the Estonian environment, 2003; Transboundary Air Pollution, 2005; Environmental monitoring 2004-2005; Persistent Organic Pollutants in Our Environment, 2006; Estonian Environmental Monitoring 2004-2006, Environmental Review 2009, et al.

On the basis of international studies of POS, the first global POS report "Global Report 2003 : Regionally Based Assessment of Persistent Toxic Substances". The global report was compiled based on reports from POSs in 12 different regions of the world. Estonia also participated in the preparation of both the global report and the European report. All 12 reports are available at the United Nations Environment Program (UNEP)

According to the website of the Chemicals Center at: www.chem.unep.ch/pts .

The data on the monitoring of dioxins in Estonian food are presented in the European Food Safety Authority report "Results of the monitoring of dioxin levels in food and feed", 2010.

11.1 Monitoring organized by the Ministry of the Environment

At present, the monitoring of dangerous substances forms a relatively small part of the national environmental monitoring program, covering primarily marine monitoring (monitoring of dangerous substances, mainly heavy metals and toxic organic chemicals in the Baltic Sea, based on the requirements of the HELCOM COMBINE program), monitoring of inland water bodies (monitoring of dangerous substances and studies in inland water bodies - since 2002). ; groundwater monitoring (monitoring of organic chemicals in the groundwater of the industrial area in North-East Estonia); river monitoring; the list of water bodies protected as salmon and carp habitats and the national environmental monitoring of these water bodies and salmon and carp (mainly heavy metal analyzes of the water of fish rivers); monitoring of hazardous substances in fresh water bodies (the levels of hazardous substances, heavy metals and persistent organic pollutants in fish of coastal seas/river estuaries are studied).
The following hazardous substances are determined in the samples collected during oral monitoring[26] : lindane, DDT, aldrin, dieldrin, endrin, isodrin, hexachlorobenzene (HCB), 1,2-dichloroethane, trichloromethane (chloroform), trichloroethylene, tetrachloroethylene and carbon tetrachloride. In addition to them, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs) and heavy metals (Cu, Cd, Pb, Zn, Hg, Ni, Ba, Co, Mo) are determined.

Monitoring of dangerous substances also takes place in the ambient air under two sub-programmes[27] ,

11.2 Monitoring organized by the Ministry of Agriculture

Monitoring of dioxins in food started in Estonia in 2002. The aim has been to determine the content of dioxins, dioxin-like PCBs and furans in fish, meat, milk, butter, eggs, food supplements and baby food. The content of hazardous substances in materials that come into contact with food is also checked[28] .

The Veterinary and Food Board carries out monitoring in the following areas related to the Convention:

- monitoring of pollutants in animal food[29] : heavy metals and organochlorine and organophosphorus compounds are determined, as well as drug residues; - in non-animal food[30] : polyaromatic hydrocarbons, pesticide residues, heavy metals are determined

- monitoring of dioxins in food[31]: determined by the presence of dioxins and dioxin-like PCBs, - monitoring of residues of plant protection products - monitoring of additives

[26] http://eelis.ic.envir.ee:88/seireveeb/index.php?id=13&act=selected_subprogram&subact=TUTV&prog_id=-385362150&subprog_id=-1803138303
[27] http://eelis.ic.envir.ee:88/seireveeb/index.php?id=13&act=show_subprograms&subact=&prog_id=-1264982023
[28] http://www.terviseamet.ee/laborid/infomatemarid.html
[29] http://www .vet.agri.ee/?op=body&id=257
[30] http://www.vet.agri.ee/?op=body&id=477
[31] http://www.vet.agri.ee/?op=body&id=457

The food research conducted in Estonia is primarily related to Baltic Sea fish, but other food has not been neglected either.

Fish from the heavily polluted Baltic Sea contain several times more PCBs than, for example, fish from the North Atlantic. At the same time, there is a large variability in the content of persistent organic pollutants in fish in the Baltic Sea region, which can be explained by the species, behavior and feeding area, for example, in the case of herring. Research in Finland and Sweden has shown that the problem is mainly related to salmon and herring. In the case of salmon, the problem is particularly acute, because according to the studies conducted by them, the dioxin content in salmon is on average 3-4 times higher than the limit.

The analysis results so far have shown that the dioxin content of the studied Baltic Sea fish remains below 4 pgTEQ/g, but the average content still fluctuates close to 3 pgTEQ/g. The limit set by the European Union in fish is 4 pgTEQ/g. Based on research, it can be said that dioxin levels depend on the age and size of the fish. In the case of herring, it can be concluded that larger herrings, with a length of 17 cm or more, are problematic. The relatively lower dioxin content of herring in our waters is probably explained by the fact that our herring is smaller and less fat than its counterparts in Finnish and Swedish waters.

Even though Estonian studies show that the dioxin content of the analyzed fish is within the limit, it cannot be said that there is no problem with dioxin. The research involves the analysis of about 100 fish samples, which is too few to draw any definitive conclusions.

11.3 Monitoring organized by the Ministry of Social Affairs

The Health Board carries out monitoring in the field of environmental health in indoor air and drinking water[32] .

Recommendations

- Continue to monitor POS remote transmission.
- Improve the monitoring of POS emissions from landfills.
- Conduct monitoring of POS contained in sewage sludge in sewage treatment plants.
- Supplement national monitoring programs with substances resulting from the obligations of the convention.
- Periodically update the national monitoring plans according to the obtained measurement results.
- Improve monitoring of bunker pollution sources (monitoring of companies). The frequency of monitoring, indicators to be determined and monitoring points should be indicated in the environmental permits.
- Regularly monitor and assess population health indicators and environmental factors.

[32] http://www.terviseamet.ee/keskkonnatervis/infomaterialid.html

12. Informing people comprehensively

The transmission of information and informing the public is carried out both digitally and in paper form as periodical publications in accordance with the Aarhus Convention, the Public Information Act and the Data Collections Act. Environmental overviews are issued periodically, and information is also provided through periodical publications.

Monitoring data has been available to the public through the Ministry of the Environment, Environmental Information Center, Estonian Environmental Research Center OÜ, University of Tartu and other monitoring publications and websites[33] .

The publication "Persistent organic pollutants in our environment" published in 2006 was compiled by the Estonian Environmental Research Center in Estonian[34] and English[35] . The purpose of the publication is to inform people about the chemicals covered by the convention, giving an overview of which chemicals are included in the list of banned or restricted chemicals of the convention, why POS are dangerous, POS as global pollutants, the main sources of POS, their spread in the environment around us, how to avoid The creation of POS in households and relevant legislation.

The booklet "PCB use and PCB waste handling" 200736 prepared by the Waste Department of the Ministry of the Environment presents the obligations arising from the legislation of the European Union and Estonia in the handling of PCBs.

POS surveys commissioned by various ministries can be found on their websites.

Ministries hold information days to introduce topics related to POS and other dangerous substances in their fields of activity (introduction of legal acts, cooperation, research results, etc.).

[33] http://www.keskkonnainfo.ee

[34] http://www.envir.ee/orb.aw/class=file/action=preview/id=1104713/pos_eesti.pdf

[35] http://www.envir.ee/orb. aw/class=file/action=preview/id=1104716/POPseng.pdf

[36] http://www.envir.ee/470014

Recommendations

• Organize trainings for officials from various fields related to POS (environmental permit givers, rescue workers, waste handlers, chimney sweeps, health workers, etc.).

• Organize trainings for specialists of county governments and local governments on environmental health risks, including risks related to POS and the possibilities of mitigating them.

• Raise the awareness of companies regarding the POSs generated in their production processes and the obligations related to these emissions (trainings for the responsible employees of the companies concerned).

• To inform the relevant companies about the best possible technique for reducing POS.

• Distribute information to residents about the burning of wood and other biofuels, the necessity of maintenance of heating systems.

• Continue to inform residents about the need to sort waste in relation to the dangers arising from POS, improve the waste collection system by making it more user-friendly.

• Inform the population about the recommended amount of consumption of herring and salmon from the Baltic Sea.

13. Research and development work and technical cooperation

Currently, Estonia is participating in two international studies of POS and other dangerous substances:

• **Baltic Sea region program project "COHIBA" (Control** *of hazardous substances in the Baltic Sea region) and project (Baltic Actions for Reduction of Pollution of the Baltic Sea from Priority Hazardous Substances) (LIFE07 ENV/ EE/ 000122).*

The main goal of the project is to support the management and control activities of the Baltic Sea countries in the implementation of the *Baltic Sea Action Plan* and to raise the awareness of stakeholders in the eastern part of the Baltic Sea about the control of dangerous substances and best practices.

• **The main goal of the Life BaltActHaz** project is to help the Baltic states implement the requirements set forth in various legislation, focusing on reducing the use of hazardous substances.

After the completion of the projects in 2011, it will be possible to obtain new information about the concentrations of chemicals covered by the convention in the Estonian environment.

Estonia's experience has shown that by being involved in international monitoring programs and research, it is possible to get a better overview of the spread and content of POS.

Recommendations

• Participate in international research programs and research.

• Development of sampling and analysis methods for existing and new POS.

• Plan long-term funding for POS research and development.

• Deal with emissions from different types of heating stoves (gaseous and solid)
By examining POSs.

• Conduct research on the impact of POS on human health and prepare monitoring plans and risk analyzes based on them.

• To develop toxicological analysis methodologies in order to assess the combined effects of dangerous substances on organisms.

14. Executive program management and coordination system and financing

The Ministry of the Environment is responsible for managing and coordinating the implementation program. The measures and activities planned in the implementation plan are covered by valid legislation and other strategic documents. Other ministries participate in the fulfillment of the requirements of the convention by performing their main tasks, which arise from various legislation and strategic documents related to the fulfillment of the requirements of the convention.

Under the leadership of the Ministry of the Environment, the measures planned in part 16 of the implementation plan are reviewed at the beginning of each year together with representatives of other ministries and are supplemented and/or changed according to the situation.

The state budget includes financial resources that state institutions make in accordance with their core activities, and which at the same time fulfill the obligations of the convention. The cost of the activities described in the implementation plan is an average of 300 thousand euros per year. of which the statutory activities of various agencies paid from the state budget make up about 20%.

Several planned activities also overlap with projects in other areas, e.g. elimination of residual pollution, which is financed from the Cohesion Fund, monitoring of hazardous substances in the water environment and ambient air, monitoring of foodstuffs, waste management, improvement of combustion processes, etc.

Activities directly related to the convention, which require funding only within the framework of the Stockholm implementation program, are presented in part 16 as activities of the Ministry of the Environment, and funding from the Center for Environmental Investments has been considered for the implementation of these measures. The need for financing specific activities is revealed from the results of the POS inventory conducted in 2011-2012.

15. The most important strategic documents related to the convention in Estonia:

Estonian Environmental Strategy until 2030 http://www.envir.ee/orb.aw/class=file/action=preview/id=328494/KS_loplil_riigikokku_1.pdf

Estonian Environmental Action Plan for 2007-2013 http://www.envir.ee/orb.aw/class=file/action=preview/id=380093/Keskkonnategevuskava+2007-2013_20022007_rtf_1.pdf

Long-term national development plan for the fuel and energy economy until 2015 http://www.riigiteataja.ee/ert/act.jsp?id=829062

Estonian Rural Development Plan 2007-2013 http://www.agri.ee/public/ftp/MAK_2007-2013_20_11_2007.pdf

Development plan of the Ministry of Social Affairs 2008-2011 http://www.sm.ee/fileadmin/meedia/Dokumentid/APO/Arengukavad/Sotsiaalministeerimi_arengukava_2008-2011.pdf

Development plan of the Ministry of the Environment 2008-2011 http://www.envir.ee/orb.aw/class=file/action=preview/id=573330/KKM_arengukava_070507.pdf

Ministry of the Interior's governance area development plan 2009-2014 http://www.siseministeerium.ee/17410/

Transport development plan 2006-2013 http://www.mkm.ee/public/1._TRANSPORDI_ARENGUKAVA_2007-2013.pdf

Ministry of Agriculture's governance area development plan 2009-2012 http://www.agri.ee/public/juurkataloog/ARENDUSTEGEVUS/VAU_2009_2012_28_03_08.pdf

Population health development plan 2009–2020 http://www.sm.ee/fileadmin/meedia/Dokumendit/APO/Arengukavad/Rahvastiku_tervise_arengukava_2009-2020.pdf

The implementation plan of the population health development plan 2009-2012 http://www.sm.ee/meie/eesmargid-ja-nende-taitmine/diormeni-arengukavad.html

16. Measures to implement the requirements of the Convention

Objectives, measures and activities		Immediate result	Relationship with other strategic with documents	The main person in charge	Co-responsible persons
Purpose	**Stockholm Convention fulfillment of obligations**				
Measure 1	**Assessment of POS emissions and forecasting**				
Direction of action 1.1	***Emissions assessment and emission data disclosure***	POS databases are regularly updated			
Activity 1.1.1 To different environments monitoring of emitted POS emissions, incl cross-border distribution		Effective monitoring, which the results are public available in all Regarding POS areas	Estonian Environmental Action Plan for the years 2007-2013 Estonian Rural Development Plan 2007-2013 Development plan of the Ministry of Social Affairs 2011–2014 Ministry of Agriculture administrative area development plan 2009-2012	KeM	SoM, Mon
Activity 1.1.2 Specific emissions of emission sources specification		Calculations done	Estonian Environmental Action Plan for the years 2007-2013 Ministry of Agriculture administrative area development plan 2009-2012 Estonian Rural Development Plan 2007-2013	KeM	PM
Activity 1.1.3 Assessment of the impact of POS on a person monitoring data of the region for health and based on health data		Continuous studies of the effects to find out. 2020 The data is public.	Population health development plan 2009– Population health development plan implementation program 2009–2012	KeM	SoM
Direction of action	***Forecasting emissions 1.2***	Forecasts prepared			
Activity 1.2.1 Estimation of POS emissions and refining forecasts to different environments		Forecasts prepared and specified	Estonian Environmental Action Plan for the years 2007-2013 Estonian Rural Development Plan 2007-2013	KeM	PM

Activity 1.2.2 Develo	pment of cross-border pollution assessment and monitoring forecasts of long-range transboundary air pollution system		Estonian Environmental Action Plan for the years 2007-2013	KeM	
and its evaluation in different 1.3 environments Action 1.3.1 Reduction of POS emissions	***Reduction of POS pollution Direction of action***	Monitoring that works			
Based on monitoring	data, evaluation of the possibilities of the Estonian Environmental Action Plan for the years and preparation of an action plan for reduction possibilities 2007-2013 to improve the situation. evaluated Ministry of Agriculture's governance area development plan 2009-2012 Ministry of the Interior's governance area development plan 2011-2014 Estonian Environmental Action Plan for the years 2007-2013			KeM	PõM, SiM
Activity 1.3.2 Reduct	ion of residual pollution Development of proposals for the creation of a legislative framework, including clearly defined responsibility for preventing the emergence of new residual pollution hotspots. Remediation and follow-up monitoring of residual pollution hotspots	The legislation stipulates the conditions for the prevention of residual pollution, the liquidation of the created pollution and follow-up monitoring, as well as restrictions on activities in areas with residual pollution		KeM	
Measure 2 Reduction of POS emissions *Action line*					
Reduction of emissions in small 2.1 solid fuel combustion devices (up to 0.3 MW)		Emissions per reduced source of pollution			
Activity 2.1.1 Require	ments for incinerators brought to the market stipulating the requirements to be submitted		Estonian Environmental Action Plan for the years 2007-2013	SiM	KeM, professional and professional associations, operators
Activity 2.1.2 Implem	entation of the standard EVS-EN 15544:2009 for small combustion devices (pottery stoves)	The principles of the standard have been implemented.	Estonian Environmental Action Plan for the years 2007-2013	SiM	KeM, professional and professional associations, operators

Activity 2.1.3 Development and implementation of good practice in the use of small incinerators ***Direction of***		Requirements for implementation	Estonian Environmental Action Plan for the years 2007-2013	KeM	SiM, professional and professional associations, operators
activity Reduction of transport-related POS 2.2 emissions Activity 2.2.1 Effective reduction of		Emissions per reduced source of pollution			
transport-related POS emissions by implementing Estonian / EU legislation and programs in the field of transport and fuel.		Claims applied	Estonian Environmental Action Plan for the years 2007-2013 Transport development plan 2006-2013 Long-term national development plan for fuel and energy economy until 2015	KeM, MKM PõM	
Direction of action Reducing industrial emissions 2.3					
Action 2.3.1 In the fuel and energy economy, ensure compliance with state-established environmental requirements		Regular monitoring Fuel and energy management long-term national development plan until 2015		KeM	PõM, MKM
Action 2.3.2 Regulation of POS emissions with environmental permits		Environmental permits take POS	Estonian Environmental Action Plan for the years 2007-2013 Estonian Rural Development Plan 2007-2013	KeM	
carried out	emissions into ***account Inventory of products containing POS*** Inventory				
Direction of activity 2.4 Activity 2.4.1 Inventory of industries and products handling products containing POS		Regular inventory carried out	Estonian Environmental Action Plan for the years 2007-2013 Development plan of the Ministry of Agriculture's governance area 2009-2012 Estonian Rural Development Plan 2007-2013 Long-term national development plan for fuel and energy economy until 2015	KeM	MKM, PõM, specialty and trade unions, operators
Activity 2.4.2 Regular inventory of products containing POS to the market, assessment of import and export and their handling as waste			Estonian Environmental Action Plan for the years 2007-2013 The Ministry of Agriculture's governance area development plan 2009-2012 Long-term national development plan for fuel and energy economy until 2015	KeM	MKM, SoM, RM, PõM, specialty and trade unions, operators

Measure 3	**Raising awareness and creating an electronic information exchange system** ***Direction***				
of activity Creating	***an electronic information exchange system 3.1, publishing information materials and training*** Activity 3.1.1 Electronic information exchange	Information materials prepared and distributed. Functional training system			
system	creation	Functional information exchange system	Estonian Environmental Action Plan for the years 2007-2013 Development plan of the Ministry of Social Affairs 2008-2011	KeM	SoM, PõM, specialty and trade unions, operators
Activity 3.1.2 Target groups (operators, making process leaders, experts in different fields, and issued, working specialists, population) raising awareness preparation and publication of sectoral information materials		Sectoral decision-information materials prepared notification system Activity 3.1.3	Estonian Environmental Action Plan for the years 2007-2013 Development plan of the Ministry of Social Affairs 2011–20141	KeM	MKM, SoM, PõM, specialty and trade unions, operators
responsibility of the institutions is clearly defined.	Possible concepts related to the natural environment are specified and the organizing the legal space regarding the prevention of emergencies, emergency preparedness planning and resolution	General principles regarding public information and early warning have been specified	The Ministry of the Interior's governance area development plan 2011-2014 Estonian Environmental Action Plan for the years 2007-2013, Development plan of the Ministry of Social Affairs 2011–2014 Population health development plan 2009–2020	SiM	KMK, KeM
Measure 4	**Linking strategic documents and legislation of various fields with the requirements of the Stockholm Convention.** ***Course of action 4.1 preparation***				
and updating of strategic documents and legislation related to the management	***of POS emissions***	Strategic documents and legislation count to Stockholm			

		with the requirements of the Convention			
Activity 4.1.1 Taking	into account the Stockholm Convention when drafting legislation and strategic documents concerning industry, transport, energy, the environment and public health	Strategic documents and legislation count with the requirements of the Stockholm Convention	Estonian Environmental Action Plan for the years 2007-2013 Development plan of the Ministry of Agriculture's governance area 2009-2012 Development plan of the Ministry of Social Affairs 2008-2014 Long-term national development plan for fuel and energy economy until 2015 Population health development plan 2009–2020	KeM	SoM, PõM, RM, JuM
Measure 5 Supervision *Direction*					
of activity Control of POS emissions and products containing POS 5.1	Action 5.1.1 Effective cooperation of	A functioning monitoring system			
different supervisory	authorities in the control of POS emissions and products containing POS	A functioning supervisory system and effective cooperation between different supervisory institutions	Estonian Environmental Action Plan for the years 2007-2013 Development plan of the Ministry of Agriculture's governance area 2009-2012 Development plan of the Ministry of Social Affairs 2011–2014	KeM	SoM, PõM, RM, MKM

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add 1

Table 1 Polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs) and calculated emissions of hexachlorobenzene (HCB) in Estonia in 1990-2008 according to the Environmental Information Center

Emissions of polychlorinated biphenyls (PCB) from fuel combustion 1990-2008. a (kg)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003						
Burning in energy, including	85.36	76.30	63.8			49.71	48.95	45.31	47.13	46.68	42.55	40.53					39.43	38.87	38.65	45.794
- *Estonia Power plant*	*39.31*	*35.26*	*30.99*	*24.56*	*24.31*	*24.75*	*24.69*	*24.88*	*23.39*	*24.21*	*24.38*	*23.99*	*24.94*	*31.26*						
- *Baltic Power plant*	*38.09*	*32.65*	*26.58*	*19.15*	*18.63*	*15.58*	*16.91*	*16.31*	*13.3*						*11.32*	*11.36*	*11.4*	*10.5*	*11.55*	
- Kohtla-Järve SEJ	*2.12*	*2.21*	*1.85*		*1.49*	*1.27*	*1.02*	*1.18*	*1.08*	*1.2*	*1.03*	*0.92*	*0.62*	*0.53*	*0.41*					
- Ahtme SEJ	*1.55*	*1.59*	*1.32*		*1.13*	*1.12*	*1.1*	*1.17*	*1.42*	*1.29*	*0.98*	*0.72*	*0.9*	*0.82*	*0.82*					
- Sillamäe SEJ					*0.69*	*0.67*	*0.69*	*0.6*	*0.55*	*0.61*	*0.58*	*0.82*	*0.87*	*0.77*	*0.71*					
Non-industrial burning	2.89	2.81	2.34		5.98	3.15	5.43	6.18	6.45	5.06	4.88	4.99	6.13	6.07	6.002					
Burning processing in the industry	2	1.90	1.1		1.32	1.33	1.03	1.14	0.89	0.72	0.4	0.38	1.92	1.78	2.119					
Transportation (railway)	0.02	0.024	0.008	0.009	0.009	0.007	0.01	**90.24**			0.006	0.002	0.001	**54.02**	0.001	0.001		0	0	
Together	**7**	**81.034**	**67.248**		**57.019**	**53.439**	**51.777**	**54.46**	**6**	**48.332**	**45.811**	**44.801**	**46.921**		**46.5**	**53.916**				

	2004	2005	2006	2007		2008
Burning in energy, incl.	45.06	42.6	39.32	50.44	43.171	
- *Estonia*	*32.96*	*30.64*	*30.55*	*37.48*	*33.01*	

add 1

Power plant					
- Baltic Power plant	*9.09*	*9.03*	*6.22*	*11.07*	*8.1*
- Kohtla-Järve SEJ	*0.36*	*0.45*	*0.35*	*0.28*	*0.14*
- Ahtme SEJ	*0.76*	*0.75*	*0.75*	*0.73*	*0.61*
- Sillamäe SEJ	*0.66*	*0.55*	*0.48*	*0.47*	*0.44*
Non-industrial burning	5.98	5.61	5.53	6.42	6,663
Burning processing in the industry	1.35	1.46	0.99	0.44	1.04
Transportation (railway)	0 0	**52.39**	**49.67**	**45.84**	0 0
Together				**57.3**	**50.875**

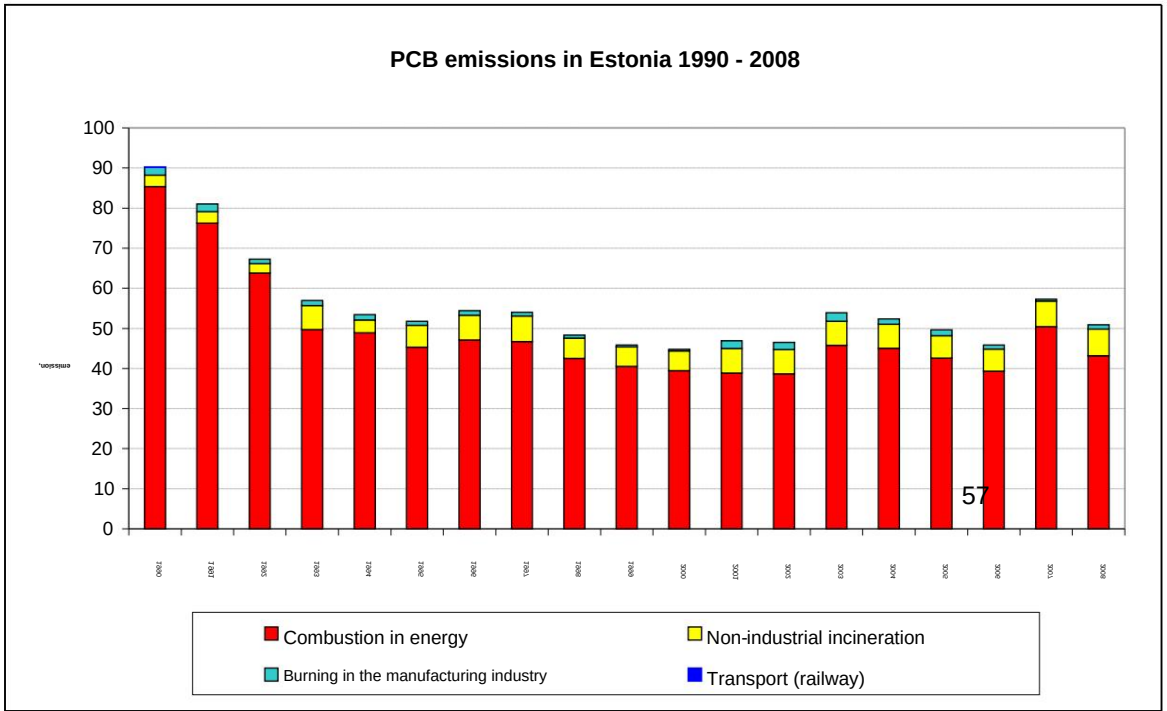
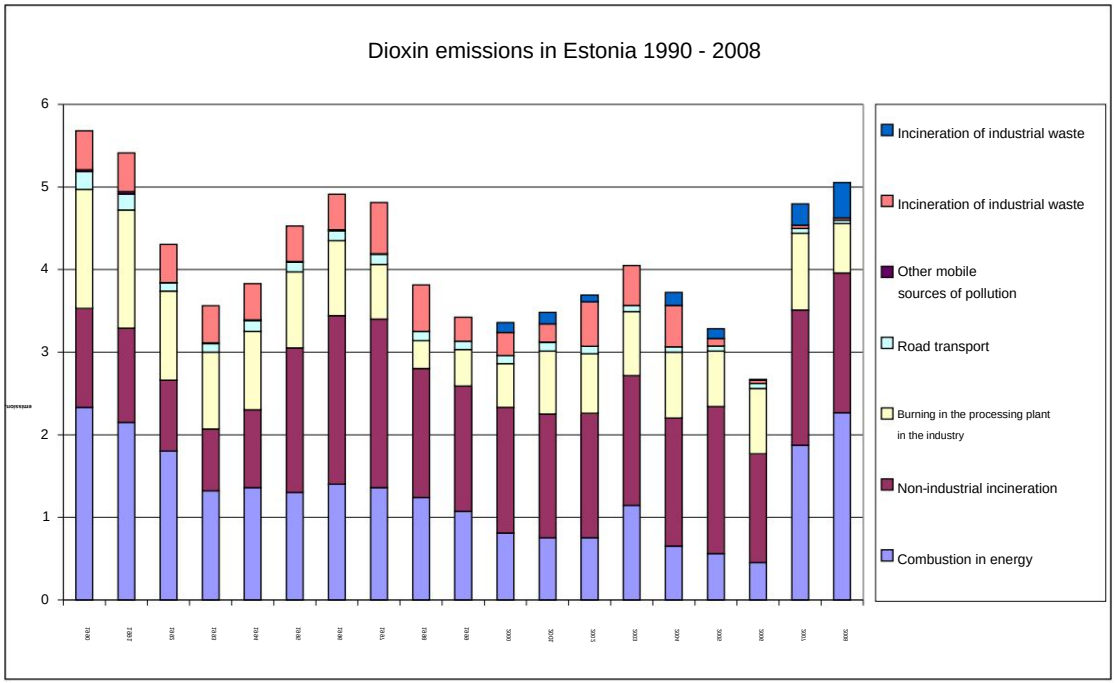


Table 2. Emissions of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) 1990-2008. a (g I-TEQ)

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	1.8	1.32	1.36	1.3	1.4	1.36	1.24	**2000**
Combustion in energy	2.33	2.15			1.07	0.86	0.75	0.94	1.75	2.04	2	,04	1,56	1,52	1,08	0,93	0,95	0,92	0.81
Non-industrial incineration	1.20	1.14			0,91	0,66	0,34	0,44	0,216	0,194	0,094	0	101	0,128	0,117	0,119	0,124		1.52
Burning in the manufacturing industry	1.44	1.43			0,11	0,102	0,024	0,	029	0.01	0.011	0.011	0.008	0.012	0.008	0.003			0.53
Road transport	0.000609	0.47	0.47	0.46	0.56	0.29													0.096
Other mobile sources of pollution																			0.001
Incineration of hospital waste					0.45	0.44	0.43	0.43	0.62										0.28
Incineration of industrial waste																			0.12
Together	**5.68**	**5.413**	**4.304**	**3.562**	**3.829**	**4.525**	**4.911**	**4.812**	**3.813**	**3.42261**									**3.357**

Table 2 cont

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**			
Combustion in energy	0.75	0.75	1.144	0.65	0.56	0.45	1.87	2.264			
Non-industrial incineration	1.5	1.51	1.571	1.55	1.78	1.32	1.64	1.6937			
Burning in the manufacturing industry	0.76	0.72	0.774	0.8	0.67	0.79	0.93	0.5962			
Road transport	0.109	0.091	0.076	0.064	0.063	0.061	0.056	0.045			
Other mobile sources of pollution	0.002	0	0.000	0	0	0	0	0			
Incineration of hospital waste	0.22	0.54	0.483	0.5	0.09	0.04	0.04				0.025662
Incineration of industrial waste	0.14	0.08	NA	0.16	0.12	0.01	0.26	0.4295			
Together	**3.481**	**3.691**	**4.048**	**3.724**	**3.283**	**2.671**	**4.796**	**5.05406**			



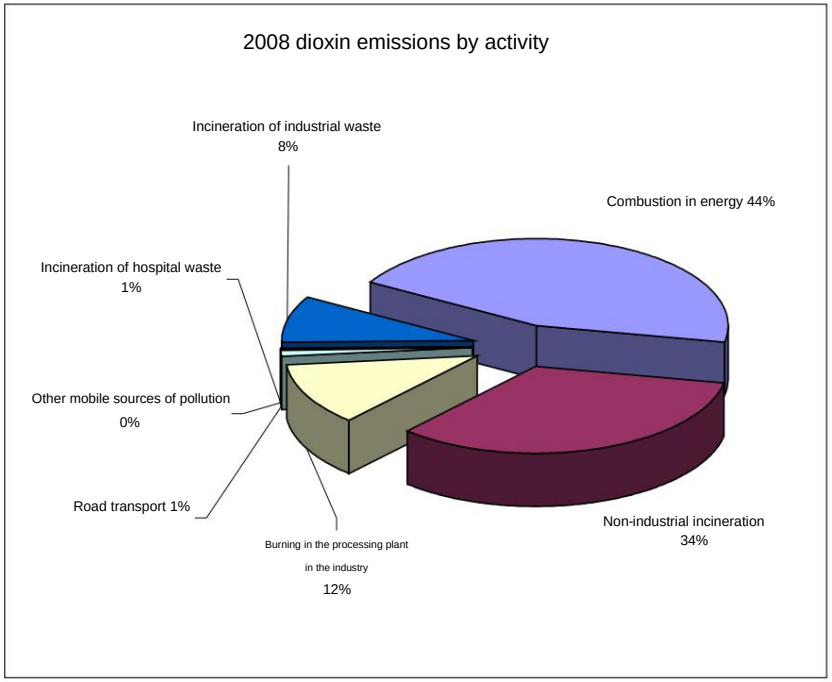


Table 3. Dioxin emissions from oil shale power plants and oil shale oil production, mg I-TEQ per year.

		1990		1991		1992		1993		1994		1995		1996	
	Special emission, so-called I-TEQ/t	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ
Estonian Power Plant	2.95	11049182	32.595	9989292	29.468	9065938	26.745	7164778	21,136	7038914	20.765	7146599	21.082	7143900	21,075
Baltic Power Station		*10497878*	0.000	*9406443*	0.000	*7798546*	0.000	*5525778*	0.000	*5358223*	0.000	*4576697*	0.000	*4999648*	0.000
TP-17	20.5	5826322	119,440	5220576	107.022	4328193	88.728	3066807	62.870	2973814	60.963	2540067	52,071	2774805	56,884
TP-67	400	4671556	1868.622	4185867	1674.347	3470353	1388.141			2458971	983.588	2384409	953.764	2036630	814.652	2224843	889,937
Narva Oil Plant	0.2	374074	0.075	205425	0.041	308916	0.062	502561	0.101	563977	0.113	510989	0.102	546088	0.109
VKG Oil and Kiviõli	0.2	1153900	0.231		0.301	1860000	0.372		0.370	1902000	0.380		0.385	1968000	0.394
VKG Energia, Põhja SEJ	20.5	506438	10,382	548766	11,250	463913	9,510	366154	7,506	316432	6,487	953695	19,551	295085	6,049
Kohtla-Järve SEJ	20.5	401380	8,228	417490	8,559	463913	9,510	310263	6,360	311221	6,380	306451	6,282	309018	6.335
Sillamäe	20.5	252413	5.174467					200441	4.109			201957	4,140		
Together			**2044,747**		**1830,987**		**1523.068**		**1086.04**		**1048,852**		**918,266**		**980,782**

Table 3 cont

		1997		1998		1999		2000		2002		2003		2004	
	Special emission, so-called I-TEQ/t	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ
Estonian Power Plant	2.95	7201063	21,243	6770242	19,972	7007119	20.671	6968298	20.556	7217574	21,292	9059720	26.726	9549575	28.17125
Baltic Power Station		*4823056*	0.000	*3932067*	0.000	*3348312*	0.000	*3343766*	0.000	*3088132*	0.000		0.000	*2710505*	0
TP-17	20.5	2676796	54.874	2182297	44.737	1858313	38.095	2359537	48,371	2072423	42,485	2162034	44.322	2176401	44.61622
TP-67	400	2146260	858,504	1749770	699,908	1489999	596,000	984229	393,692	1015709	406,284	1280607	512,243	534104	213.6416
Ewe device	0.2	608889	0.122	509005	0.102	488087	0.098	686756	0.137	799276	0.160	917306	0.183	965353	0.193071
Oil industry and Kiviõli	0.2		0.326	1288000	0.258		0.260	1317000	0.263	1483724	0.297	1740468	2.731 0.348	1796127	0.359225
VKG Energia, Põhja SEJ	20.5	252840	5.183	298931	6.128	257931	5.288	235973	4.837	133197		91686	1.880	81312	1.666896
Kohtla-Järve SEJ	20.5	374679	7,681	340198	6,974	258567	5,301	204053	4.183	216673	4,442	206321	4,230	190585	3.906993
Sillamäe	20.5	163752	3.357			167262	3.429							202317.4	4.147507
Together			**951.29**		**778,079**		**669.14**		**472,040**		**477,689**		**589,931**		**296.7**

Table 3 cont

		2005		2006		2007		2008	
	special emission, Mr TEO/t	Oil shale amount, tons	emissions, mg I-TEQ	Oil shale amount, tons	Emissions collection s, mg I-TEQ	Oil shale quantity, tons	emissions, mg I-TEQ	Oil shale amount, tons	emissions, mg I-TEQ
Estonian Power Plant	2.95	8877628	26.189	8809186.00	25.9871	11094216.00	32.7279372	9690339	28.5865
Baltic Power Station		*2531295*	0						200
TP-17	20.5	2334072	47.84848	1702403	34.89926	1312775	26.9118875		
TP-67	400	197223	78.8892	60791	24.3164	1830415	732,166		
Ewe device	0.2	1053699	0.21074	993120	0.198624	965745	0.193149	1305418	0.2610836
Oil industry and Kiviõli	0.2	1834336	0.366867	20.5 1994174	0.398835	2087337	0.4174674	2037899	0.4075798
VKG Energia, Põhja SEJ	101001	2.070521		94009	1.927185	71318	1.462019	34343	0.7040315
Kohtla-Järve SEJ	20.5	193955	3.976078	188804	3.870482	185428	3.801274	156435.5	3.2069278
Sillamäe	20.5	181013	3.710767	163301	3.347671	158259	3.2443095	129506.7	2.6548865
Together			**163,262**		**94.9456**		**800,924**		**235,821**

Table 4. Emissions of dioxins from processing industry 1990-2008. a, mg I-TEQ in 1990 1994 Quantity,

				1991		1992		1993				1995		1996	
	EF, ÿg TEQ/t prod.	tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ
Cement product flow1)	0.6	938000	0.07 562.80	905000	543	483000	289.80	364000	6.44 212.4	402500	1.47 241.50	417600	1.26 250.56	387700	1.176 232.62
Lime production	185000		12.95	207000	14.49	92000	21000			18000		16800		17400	1.22
Production of building bricks2)	0.2	541401	108.28	592206	118.4412	350444	70.09	139217	27.8434	128283	25.66	81343	16.2686	68009	13.60
Together			**684.03**		675,931		**366.33**		241,713		**268.42**		268,005		**247.44**

ÿ- special release according to UNEP "Standardized Toolkit for Identification of Dioxin and Furan Releases".

2) - 1 brick = 0.002667 tons

Table 4 cont

		1997		1998		1999		2000		2001		2002		2003	
	EF, ÿg TEQ/t prod.	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ
Cement product loss3)	0.07	422500	0.07 29.575	321300	22.491	357700	25.039	329100	23.037	404600	28.322	465900	1.4 32.613	506300	35,441
Lime production		19500	1.365	32100	2.247	23300	1.631	21200	1.484	20000		21200	1.484	32000	2.24
Production of building bricks	0.2	62674	12.5348	54674	10.9348	46139	9.2278	45072	9.0144	54140	10,828	61608	12.3216	63741	12.7482
Together			**43.4748**		**35.6728**		**35.8978**		**33.5354**		**40.55**		**46.4186**		**50.4292**

Table 4 cont

		2004		2005		2006		2007		2008	
	EF, ÿg TEQ/t prod.	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ	Amount, tons	emissions, mg I-TEQ
Cement product loss3)	0.07	506300	0.07 35.441	726000	2.24 50.82	848900	2.59 59.423	936200	65.534	806100	56,427
Lime production	32000		37000		39700		2.779	43500	3.045	59400	4.158
Construction brick production	0.2	63741	12.7482	69342	13.8684	82667	16.5334	143485	28.697	113081	22.6162

go											
Together			**50.4292**		**67.2784**		**78.7354**		**97,276**		**83, 2012**

Until 1997, dioxin emissions for cement production are calculated according to Toolkit EF, from 1997 measurements

Table 5. Dioxin emissions from the incineration of hospital waste by company, mg I-TEQ per year

	1996				**1997**				**1998**				**1999**			
	amount of waste		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ
	R1	D10			R1	D10			R1	D10			R1	D10		
Epler & Lorenz AS		0.141	525	0.07		0.636	525	0.33		2.101	525	1.10		3,502	525	1.84
Haapsalu Neurological Rehabilitation center		0.05	40000	2.00		0.03	40000	1.20			40000				40000	
Hiiumaa Hospital		1.1	40000	44.00		1	40000	40.00	1		40000	40.00		1	40000	40.00
Jämejala Psychiatric Hospital			40000		0.4		40000	16.00	0.4		40000	16.00	0.3		40000	12.00
Kuressaare Hospital Foundation	0.1		40000	4.00	0.1		40000	4.00		0.1	40000	4.00		0.1	40000	4.00
Lihula Hospital		0.101	40000	4.04		0.101	40000	4.04			40000				40000	
Narva Hospital			40000				40000				40000				40000	
Põlva Haigla AS			40000		1.103		40000	44.12			40000		2.001		40000	80.04
Sõmera Nursing Home	0.05		40000	2.00	0.05		40000	2.00	0.04		40000	1.60	0.2		40000	8.00
Siku OÜ		4.46	40000	178.40		12.5	40000	500.00		5.43	40000	217.20	0.8		40000	32.00
Türi Perearistikeskus OÜ			40000				40000				40000				40000	
Viljandi County Hospital	0.55		40000	22.00		0.15	40000	6.00		0.15	40000	6.00 2.31			40000	92.40
Pärnu Hospital, foundation			40000				40000				40000				40000	
South Western Health and Social Welfare Center SA			40000				40000				40000				40000	
Lõuna-Eesti Haigla, AS			40000				40000				40000				40000	
Estonian Seamen's Hospital	0.1		40000	4.00	0.1		40000	4.00			40000				40000	
Maarjamÿisa Hospital UNIT	0.48		40000	19,20			40000				40000				40000	

	1996				1997				1998				1999			
	amount of waste		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ
	R1	D10			R1	D10			R1	D10			R1	D10		
Mustvee Hospital	0.5		40000	20.00			40000				40000				40000	
Märjamaa Haigla OÜ	0.11		40000	4.40	0.08		40000	3.20	0.11		40000	4.40	0.05		40000	2.00
Tapa Haigla AS	2.5		40000	100.00					6.5		40000	260.00	0.5 7.68		40000	20.00
Tartu Skin Diseases Clinic		0.3	40000	12.00						0.192	40000					
University of Tartu Children's Clinic	0.26		40000	10.40												
Together				**426.51**				**624.89**				**557.98**				**292.28**

Table 5 cont

	2000				2001				2002				2003			
	amount of waste		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ
enterprising	R1	D10			R1	D10			R1	D10			R1	D10		
Epler & Lorenz AS		8,866	525	4.65		7,182	525	3.77		1,512	525	0.79		7,311	525	3.84
Haapsalu Neurological Rehabilitation center	0.05		40000	2.00												
Hiiumaa Hospital	1		40000	40.00	1		40000	40.00								
Jämejala Psychiatric Hospital	0.3		40000	12.00	0.3		40000	12.00								
Kuressaare Hospital Foundation		0.1	40000	4.00												
Lihula Hospital		0.101	40000	4.04	0.801		40000	32.04								
Narva Hospital		0.546	40000	21.84			40000			0.546	40000	21.84		0.546	40000	21.84
Põlva Haigla AS		2.5	40000	100.00		2.8	40000	112.00		2.2	40000	88.00		1.8	40000	72.00
Sõmera Nursing Home	0.2		40000	8.00	0.2		40000	8.00								
Siku OÜ	1.24		40000	49.60												
Türi Perearistikeskus OÜ			40000	0.00												
Viljandi County Hospital	2.1		40000	84.00			40000									
Pärnu Hospital, foundation						0.362	40000	14.48								
Southern Western Health-ho-after all, and Social Welfare Center SA									0.001		40000	0.04	0.001		40000	0.04
Lõuna-Eesti Haigla, AS										10.85	40000	433.92		10.85	40000	433.92
Together				**330.13**				**222.29**				**544.59**				**531.64**

Table 5 cont

	2004				2005				2006				2007			
	amount of waste		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ	waste quantity		EF, ÿg TEQ/Mg	emission, mg I-TEQ
enterprising	R1	D10			R1	D10			R1	D10			R1	D10		
Epler & Lorenz AS		6.297	525	3.31		9.7	525	5.09		1,888	525	0.9912	9.785		525	5.137
Narva Hospital		0.546	40000	21.84												
Põlva Haigla AS		1	40000	40.00		2.2	40000	88.00	0.9		40000	36				
South Western Health and Social Welfare Center SA	0.001		40000	0.04									0.801		40000	32
Lõuna-Eesti Haigla, AS		10.8	40000	432.00		10.8	40000	432.00								
Together				**497.19**				**525.09**				**36.9912**				**37,137**

Table 5 cont

	2008			
	amount of waste		EF, ÿg TEQ/Mg	emission, mg I-TEQ
enterprising	R1	D10		
Epler & Lorenz AS	48.88		525	25,662
Narva Hospital				
Põlva Haigla AS				
Lõuna Länemaa Health Care and Social Welfare Center SA				
Lõuna-Eesti Haigla, AS				
Together				**25,662**

Table 6. Hexachlorobenzene (HCB) emissions from burning fuels 1990-2008. a, kg per year

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	0.02	0.02	0.03	0.04		**1999**
Combustion in energy	0.02	0.02		0.01		0.03		0.03		0.04					
Non-industrial combustion no	0.04	0.04	0.03	0.03	0.05	0.09	0.11	0.11	0.09	0.08					
Burning in processing industry															
Together	0.06	0.06	0.05	0.04	0.07	0.12	0.14	0.14	0.13	0.12					

Table 6 cont

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	0.02			**2008**
Combustion in energy	0.03	0.02	0.02	0.03	0.03	0.03	0.02		0.021			
Non-industrial combustion no	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.1	0.1			
Burning in processing industry	0.01	0.03	0.02	0.02	0.04	0.04	0.02	0.01	0.023			
Together	**0.13**	**0.14**	**0.13**	**0.14**	**0.16**	**0.15**	**0.12**	**0.13**	**0.144**