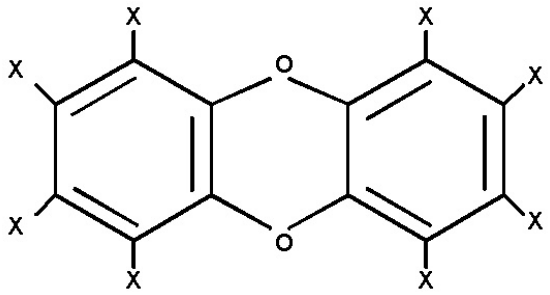
REPUBLIC OF CYPRUS

NATIONAL IMPLEMENTATION PLAN OF STOCKHOLM CONVENTION FOR PERSISTENT ORGANIC POLLUTANTS



MINISTRY OF LABOUR, WELFARE AND SOCIAL INSURANCE

DEPARTMENT OF LABOUR INSPECTION

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Summary

The Stockholm Convention of 2001 aims to protect human health and the environment from the Persistent Organic Pollutants, POPs, i.e. from the chemical substances having toxic properties, resist in break down, accumulate in humans and animals, can be transferred by air, water and birds as well as can be deposited in long distances away from their emissions sources.

The Convention makes provision for the responsibility of the member states regarding the application of measures for the prohibition or the elimination certain chemical substances or the limitation of the production or usage of chemical substances with Persistent Organic Pollutant characteristics such as the 1,1,1-trichloro-2,2-di(4-chlorophenyl)ethane known as DDT. In addition, it provides for the implementation of measures for the reduction or minimisation of emissions of POPs produced unintentionally from human sources.

Cyprus has ratified Stockholm Convention with the law 42(III)/2004. The development of the National Implementation Plan (NIP) of the provision of the Convention comprises an essential responsibility of every member state of the Convention.

A group of nine chemical compounds comprised the initial catalogue (Annex A) of the chemical compounds which were foreseen to be eliminated by the application of juridical and managerial measures. With the amendment of the law in 2010 (17(III)/2010), ten new chemical substances or groups of chemical substances were included in the catalogue.

In 2012, after a new amendment of the law which ratified the Convention (25(III)/2012), the chemical substance endosulfan and its isomers were added in Annex A of the Convention. All the chemical substances of Annex A of the Convention have never been produced in Cyprus, whereas their import and usage has been prohibited. It is estimated that in Cyprus there are no stocks of the substances included in Annex A of the Convention.

Special caution in the effort for the implementation of the Convention's provisions was taken in another group of chemicals of Annex A of the Convention, the polychlorinated biphenyls known as PCBs, which, for example, are found in the liquids (oils) of transformers. For the application of a better control of imported used transformers, the importers have to present specific certificates to prove that the oil of the transformers is free from PCBs.

The POPs included in Annex C of the Convention and produced unintentionally from human sources, are dioxins and furans, hexachlorbenzene and PCBs.

In Cyprus, the study of the emitted dioxin quantities begun in 2002, in the framework of a Plan which was implemented by a group of European Organisations for the European Committee under the supervision of the organisation TNO of the Netherlands. The other organisations were the IUTA Germany, the IOW France and the SHMU Slovakia. The title of this Plan, which lasted two years, was «Dioxin Emissions in Candidate Countries» and its aims were:

(a) the emission inventory of dioxins in the ten new member states of European Union
(b) the training of the representatives of these ten countries for the preparation of the emission inventory of dioxins with the use of emission factors
(c) the carry out of measurements of dioxin emissions in various industrial installations in the member states

Cyprus took part in this Plan with the Department of Labour Inspection (DLI) of the Ministry of Labour, Welfare and Social Insurance. During the implementation of this Plan, the first emission inventory of dioxins was completed for 2002. In addition, two measurements of dioxin emissions were carried out by the DLI's personnel under the supervision and guidance of an EU expert.

The above mentioned measurements were complemented by calculations carried out based on the EMEP/EEA Emission Inventory Guidebook 2009/2013. From the inventory it was shown that the major percentage of dioxin emissions was caused by the uncontrolled burning of waste (agricultural and domestic). On the basis of the implementation of the relevant legislation (such as the prohibition of burning of agricultural waste) as well as due to the construction of landfill sites, the uncontrolled burning of waste was terminated and the emissions of POPs were reduced greatly.

Moreover, the burning of domestic waste and waste of building under construction in inhabited areas is regulated by the Municipalities' Law. The Union of Municipalities forwarded an amendment of this Law, so that the matter of burning of any waste in municipalities should be regulated extraducially. By this way, it is expected that the emissions of POPs will be reduced more.

The industrial sources in Cyprus responsible for the emissions of POPs are limited and the emissions from these sources are in very low levels. Furthermore, by using Best Available Techniques in these sources, based on the implementation of the Law for the Control of Atmospheric Pollution of 2002 to 2013, it is anticipated that these emissions will be maintained in low levels.

The emission inventories of hexachlorobenzene and PCBs of Annex C of the Convention were carried out by using emission factors based on the EMEP/EEA Emission Inventory Guidebook 2009/2013. For these pollutants, at the moment, there is not any manual of emission factors similar to the manual of emission factors of dioxins. For this reason, the inventories of hexachlorobenzene and PCBs present high uncertainty factor in relation to the emission inventories of dioxins. However, it is anticipated that the measures taken in Cyprus for the reduction of dioxin emissions will have similar results in the reduction of the emissions of these pollutants.

From the data taken for Cyprus, it is shown that the basic target for Cyprus must be the gradual reduction of the emissions of POPs by the reduction of uncontrolled burnings and the use of alternative materials, products and processes for the prevention of the formation and release of POPs into the environment.

Apart from the implementation of the relevant legislation, the competent authorities and the public is needed to be informed for the effects of such releases and sources to the environment and to human health.

The DLI has already organised a meeting in 23.11.2007 and informed all relevant Governmental and non-Governmental organisations regarding POPs emissions from burning and incineration processes.

1. INTRODUCTION

Persistent Organic Pollutants are organic substances which have toxic characteristics, remain in the environment for long time, bioaccumulate, can be transferred transboundary in the atmosphere and are deposited in long distances, creating significant harmful effects for human health or the environment close or far from their sources.

1.1. Stockholm Convention

The Convention was prepared in 2001 under the framework of the effort to protect human health and the environment and the aim to limit and eliminate the danger from POPs.

Until today, 152 countries have signed the Convention, while 179 countries have ratified it. Cyprus ratified the Convention on the 7th of May 2003.

Based on article 3 of the Convention, the member states signed it are obliged to prohibit or to apply measures for the elimination of the production, use, import and export of the chemical compounds included in Annex A of the Convention, which are:

- Aldrin – pesticide
- Chlordane – pesticide
- Dieldrin – pesticide
- Endrin – pesticide
- Heptachlor – pesticide
- Hexachlorobenzene – biocide
  – by-product from the production of other chemical substances
  – trace/residue in other chemical substances
  – product from burning
- Mirex – pesticide
  – additive in plastics and rubber for the reduction of burning rate
- Toxaphene – pesticide
- Polychlorinated Biphenyls (PCBs) – Chemical substances used as oils in heat exchangers, transformers, capacitors, as additives in paints and plastics as well as additives in carbonless copy paper. They are also produced unintentionally during the burning processes.

Moreover, in the Convention, the following new chemical substances are also included:

- a-hexachlorocycloexane - pesticide and by-product from the production of other chemicals
- b-exachloroexane - pesticide and by-product from the production of other chemicals
- Chlordecone - pesticide
- Hexabromobiphenyl – industrial chemical substance
- Hexabromobiphenyl ether – industrial chemical substance
- Heptabromobiphenyl ether – industrial chemical substance
- Lindane - pesticide

- Pentachlorobenzene - pesticide, industrial chemical substance and by-product from the production of other chemicals
- Tetrabromodiphenyl ether – industrial chemical
- Pentabromodiphenyl ether - industrial chemical

In Annex A of the Convention the chemical substance endosulfan and its isomers (insecticides) were included in 2011, while in 2013 the chemical hexabromocyclododecane (HBCD), flame retardant, is added also.

Another provision of article 3 of the Convention refers to the limitation of the production or use of the chemical substances included in Annex B of the Convention such as the 1,1,1-trichloro-2,2-di(4-chlorophenyl)ethane, known as DDT. In Annex B of the Convention two new chemical compounds were added in 2009 i.e. the Perfluorooctane sulfonic acid and the Perfluorooctane sulfonic fluoride, which are industrial chemicals.

The countries signed the Convention must also, under article 5 of the Convention, implement measures for the prevention of the formation and release of the unintentionally emitted POPs included in Annex C of the Convention. These pollutants are:

- Dioxins and Furans – Dioxins are the name of a group of very toxic, polychlorinated chemical substances, which are produced mainly from combustion. The group of dioxins is consisted of 75 types of polychlorinated dibenzo-p-dioxins (PCDD) and 135 types of polychlorinated dibenzofurans (PCDF). These substances are not produced in industrial scale but only in lab scale for research. However, they are produced during the combustion process (fuel and waste) as well as by-products from various industrial processes. The dioxins can accumulate in the human and animal fat.
- Hexacholobenzene and Polychlorinated biphenyls – They are included also in Annex A of the Convention as stated before. They are produced during the combustion process of fuels and wastes, as referred above for the dioxins.
- Pentachlorobenzene (Included in Annex C of the Convention in 2009)

The most important measures that the countries signed the Convention have to apply for the reduction of the emissions of the above pollutants, based on the Convention's provisions, are:

(a) The application of Best Available Techniques (BAT) in industrial installations (Article 5)
(b) The promotion of the development and, where necessary, the demand for the use of substitute or modified materials, products and processes for the prevention of the formation and release of the chemicals of Annex C to the environment (Article 5).
(c) The reduction of POPs emissions from pesticide stocks as well as from waste (Article 6).
(d) The preparation of the National Implementation Plan of the Convention's provisions from the countries signed it (Article 7).
(e) The application of measures for the promotion of public information regarding the Convention's provisions (Article 10).
(f) The carrying out of a study and control of the sources, emissions and levels of POPs in the environment and human health (Article 11).

(g) The submission of reports to the conference of the member states through the Secretary regarding the implementation of the Convention (Article 15).
(h) The evaluation of the effectiveness of the Convention (Article 16).

The Convention provides also for the procedure to be followed for the classification of other chemicals in the catalogue of POPs in the future.

1.2. National Implementation Plan (NIP)

Based on the commitments derived from the ratification of the Convention for POPs (Law 42(III)/2004) and specifically the Article 7, every country singed the Convention should have prepared two years after the accession in the Convention, a National Implementation Plan (NIP) for the implementation of the Convention's provisions. The Council of Ministers accepted the NIP of Cyprus on the 29th August 2007.

The Department of Labour Inspection (DLI) of the Ministry of Labour, Welfare and Social Insurance (MLWSI) undertook the responsibility for the preparation of the NIP. DLI has the responsibility for the implementation of the Convention.

The steps followed for the preparation of the NIP are the following:

(a) The identification of the main sources of POPs in Cyprus and calculation of the emissions to the environment.

(b) The dispatch of letters to all relevant Governmental Departments as well as to the Cyprus Union of Municipalities, to inform them and collect any relevant data that they posses to include them in the NIP.

(c) The organization of a meeting to inform all the Governmental and non-Governmental organizations, representatives of other organizations (trade, industry, agricultural), environmental organization etc.

(d) The information of the public through the DLI's website:
www.mlsi.gov.cy/dli

(e) The preparation of a draft NIP and its dispatch to all relevant organizations for comments. In addition, the NIP was available in DLI's website for four weeks for comments.

(f) The submitance of the final document of the NIP to the Council of Ministers for information and ratification.

(g) The submitance of the new NIP, through the Minister of Foreign Affairs, to the Secretary of the Convention, in English language.

2. BASIC INFORMATION FOR CYPRUS

2.1. General

2.1.1. Geography and population

Geographic position

Cyprus is in the Eastern Mediterranean, 97 km west of Syria and 64 km south of Turkey (33^{o} east, 35^{o} north). It is the third largest island of the Mediterranean after Sicily and Sardinia, having 9,251 square kilometers area. It has maximum length of 240 km from the eastern to the western point and maximum width of 100 km from the northern to the southern point.

Morphology

Cyprus has two Mountains, Troodos to the northwest part of the island with its highest top Olympos (1,953 meters) and Pentadaktylos to the northern part of the island with its highest top Kyparisobounos (1,024 meters). In between the two mountains there is the plain of Mesaoria. There are no perennial rivers with constant flow but only some streams, a few fountains and streams.

Climatic and weather conditions.

Cyprus has a characteristic Mediterranean climate with a typical seasonal pattern influenced significantly by the temperature, the rainfall and the weather in general. The summers are hot and dry and they last from June until September while the winters last from November until March and they are rainy and unstable. There is a small period of spring and autumn during the respective months April, May and October.

The rainfall is geographically distributed unevenly with the highest in the two mountains and the lowest in the eastern and coast areas. The total annual average rainfall reaches the 450 mm in the northwestern areas and 1,100 mm at the top of the Troodos mountain.

The small rainfall quantity in the summer months has minimum contribution to the increase of the water resources and agriculture because the rain is absorbed very quickly from the dry ground and it evaporates fast due to the high temperatures and the low moisture. The agriculture as well as the water stocks are based on the autumn and winter rainfall.

It is expected that, in the following years there will be greater water scarcity and possible desertification of some areas due to the climatic change influencing Cyprus as well.

Population.

In the end of 2011 the population of Cyprus was 862,000 inhabitants. This number does not include the 162,000 settlers who live in the occupied part of Cyprus

from the Turks. This number includes the 8,000 (1%) of Maronites, Armenians and Latines of the Greek-Cypriot community.

Languages.

Languages are the Greek and Turkish.

2.1.2. Political and financial situation

Executive Authority

The Governing system is Presidential. The President of the Republic is elected with voting for five years. The Executive Authority is applied from the President and one Council of Ministers of eleven Ministers which is appointed by the President. The Turks deny taking part in the Government from 1963.

Legislature Authority

The Legislature Authority is applied from the House of Representatives. The election system is that of the simple proportional. The members of the House of Representatives are elected with voting for a period of five years. The places of the Tuskish-Cypriots remain empty.

Judicial Authority

The Judicial Authority is applied by the Higher Court of the Republic, the criminal court and the district courts, which comprise independent authority.

Independent officers and bodies.

There are a number of officers and bodies which are not included in Ministries. The General Attorney and the General Inspector, who are the leaders if the Legislature and Inspection Service respectively, as well as the Director of the Central Bank, comprise based on the Constitution, independent officers of the Republic. The Public Service Commission, the Educational Service Commission and the General Director of European Programs, Coordination and Development of Cyprus Republic operate also as independent bodies.

Other independent bodies include: the Treasury of the Republic, the Commission for the Protection of Competition, the Office of the Commissioner of Environment, the Office of the Commissioner for the Electronic Communications and Postal Regulations, the Office of the Commissioner for Personal Data Protection, the Cyprus Agricultural Payments Organization, the Cooperative Societies' Supervision and Development Authority, the Cyprus Broadcasting Corporation, the Tenders Review Authority, the Office of the Commissioner for the Administration, the Cyprus Securities and Exchange Commission and the Cyprus Energy Regulatory Authority.

Local Authorities

The municipal and community councils have the responsibility for the local authority. The municipal councils deal with the provision of services and they have managerial authorities in towns and in large agricultural communities, while the

community councils have the responsibility for the local administration in villages. These councils are independent bodies and their members are elected with voting.

International Relations.

The target of Cyprus' international policy is the active role in procedures which aim to the promotion of international cooperation, piece and viable development.

Cyprus always has been votary of the human rights, the ascendancy and the integrity of territories of the countries as well as defender of international piece and safety. Its geographical position enables it to have active role not only in the area of Eastern Mediterranean but also inside European Union (EU). Its accession in the EU in 2004 promoted greatly its relations with third countries, establishing it as a communication bridge between the EU and these countries.

Cyprus is a member of international organisations, which include the following:

- the Organisation of United Nations (1960) and almost every specialised bodies and organisations,
- the Council of Europe (1961)
- the Commonwealth (1961)
- the Organisation for Safety and Cooperation in Europe (1975)
- the International Maritime Organization (IMO) (1978)

Economy

During the last two decades Cyprus economy has changed from agricultural economy to economy of light industry and services. Today, Cyprus is an important tourist destination with developed social infrastructure.

In 29th of April 2005, Cyprus pound was introduced to the Exchange Rate Mechanism 2, which is prerequisite for the accession to the Economic and Monetary Union (EMU). The parity under which Cyprus pound was introduced was 1 euro to 0.585274 pounds.

In November 2013, the Consumer Price Index was reduced by 0.85 units or 0.72% reaching the 117.83 units in comparison to 118.68 units in October 2013. This is due to the reductions in the prices or several fresh fruits and vegetable and petroleum products. Increases were noticed in the prices of several types of cloth wear and footwear.

In November 2013, the inflation was reduced with rate -2.1% in comparison to -1.6% in October 2013 and 1.2% in November 2012.

For the period January – November 2013 the Index showed a reduction of 0.2% in comparison to the corresponding period 2012.

In the following Figure 1, it is shown the Gross Domestic Product (GDP) for the primary, secondary and tertiary sector.

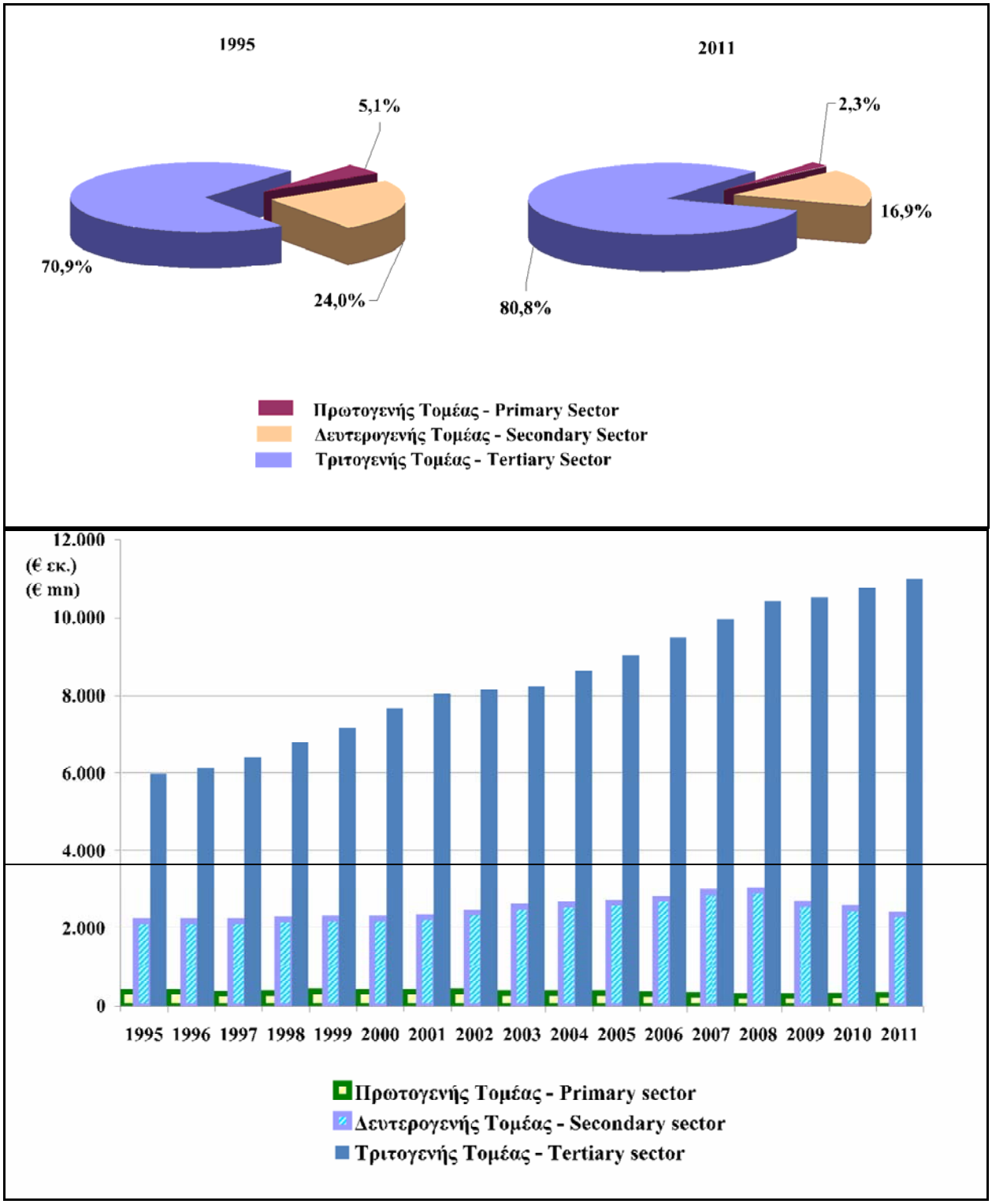


Figure 1: Distribution of Gross Domestic Product - GDP (Statistical Service Cyprus)

2.1.3. Environmental review.

The protection of environment has gained significant meaning after the accession of Cyprus in the EU, since together with the economy and the social cohesion comprise the three basic axis of the European policy, as declared in the EU strategies for Sustainable Development and Lisbon Treaty. As a result, while before Cyprus accession to the EU there was only some specialised legislation or fragmentary provisions for the environment in general legislation, after its accession there are approximately 200 enactments for the protection of the environment.

The rapid economic development of the last four decades, the high living standard and the significant change in the way of living, has leaded to the exercise of some pressures to the natural resources and the environment of Cyprus. It should be noted that, in the meantime and in relation to the industrially developed countries, the effects on the environment are limited.

Already, relevant policies and measures have been directed in all sectors for the conservation and, whereas needed, the improvement of the condition.

2.2. Institutional and legislative framework.

2.2.1. Environmental policy – Strategic targets.

Basic pursuit of the Governmental policy regarding the sector of environment comprises the preservation of the environmental wealth of the country and the implementation of the sustainable development concept. For this reason, it is pursued that the development of the country is promoted with respect to the natural environment so that to achieve its preservation for the future generations.

For the accession of the environmental perspective in all sectors of the economic development, the implementation of the environmental legislation, which adopts the provisions of the European environmental acquis, is promoted.

The policy for the solid and dangerous waste aims to the implementation of a program of energy and raw material recovery through the recycling of a part of the produced waste and the limitation of their volume deposited in landfill sites and notably through the construction of Complete Installations of Waste Treatment (CIWT).

Solid waste.

Specifically, the Solid Waste Management sector, Ministry of Interior, promotes the implementation of the following projects in the framework for the implementation of the Solid Waste Strategic Management Plan (SMP) in Cyprus, which can contribute positively in the control and management of POPs:

<u>Complete Installations of Waste Management (CIWT)</u>

1. Larnaka-Famagusta district.

The CIWT and the station for the transhipment of waste (STW) in Skarinou are in full operation from 1st of April 2010. The total construction cost of the project reached €46 millions and it is co-funded by the Cohesion Fund of EU and National Resources.

2. Nicosia district.

During the second semester of 2014, the offer for the construction of the CIWT in Kato Moni community and the STW in Linou community will be announced. As soon as the decision for the implementation of the construction is taken, the offer will be announced for the construction of the project. The duration for the completion of the project will be 24 months.. The total cost for the project is estimated approximately in €60 millions, not including VAT and it is promoted to be co-funded by the Cohesion Fund of EU and National Resources.

3. Lemesos district.

In 28/4/2014, the offers for the construction of the CIWT in Pentakomo community and the STW in Kantou community have been submitted. The agreement for their construction is expected to be singed until the end of 2014 and the construction work is expected to be completed in the first half of 2016. The total cost of the project is estimated approximately to be €45 millions, not including the VAT, and for the 10-year operation approximately the cost will be €30 millions, not including the VAT. The project is promoted to be co-funded by the Cohesion Fund of the EU and National Resources.

4. Pafos district.

The landfill site of Pafos district operates from June 2005 and it is constructed based on the Directive 99/31/EC for the sanitary landfill of waste. On the 4/4/2012 a contract was signed for the preparation all the necessary studies and documents for the construction of an CIWT for Pafos district in the existing space of the landfill site of Pafos and the supervision of the construction work. A decision for the completion of the project will be taken as soon as the necessary studies will be completed. The total cost is estimated to be approximately €30 millions not including the VAT and it will be funded from National resources.

Restoration of Uncontrolled Landfill Sites (ULS)

After the commencement of the operation of Pafos landfill site (1/6/2005) and the CIWT in Larnaka-Famagusta (1/4/2010), the operation of 115 Uncontrolled Landfill Sites (ULS) in Cyprus was terminated. There are still two ULS operating today (Kotsiatis-Vati), which serve the needs of Nicosia and Limassol districts for the landfill of domestic waste.

1. Larnaka-Famagusta districts.

On the 29th of June 2009 the preparation of all the necessary studies and documents for the restoration of the 16 ULS of Larnaka-Famagusta district has started and completed. On the 16th of December 2011 a contest for the restoration of the ULS of these two districts was announced but it was cancelled because none of the offers fulfilled the prerequisites of the Authority. Due to the time limitation and for the better monitoring of the restoration work, it was decided that the project should be separated in three parts. In the first half of 2014, three contests were announced, the offers were submitted and evaluated and it is expected that until the end of September the relevant agreements will be singed with the successful candidates. The total cost of the project is estimated to be €18 millions not including the VAT and it is promoted to be funded by the Cohesion Fund of the EU during the programmed period 2007-2013. It is expected that the construction work will be completed in the end of 2015.

2. Pafos district.

On the 21st of June 2013 the contract for the restoration of the 37 ULS of Pafos district was signed and the work was started in 15 July 2013. The total cost of the contract will be €6.622.000 not including the VAT and it is co-funded by the Cohesion Fund of the EU during the programmed period 2007-2013. The construction work is expected to be completed in the beginning of 2015.

3. Nicosia-Limassol districts.

The construction work for the restoration of the 20 ULS of Nicosia district and the 43 ULS of Limassol district, including Kotsiati and Vati, is expected to start in the beginning of 2016 when the CIWT of the two districts will be completed.

Liquid waste.

The main pursuit in the sector of liquid waste comprised the gradual harmonization, until 2012, with the EU Directive 91/271/EC for the civically waste, which refer to the installation of central sewerage systems for the collection and treatment of wastewater in all settlements, which they have population of more than 2000 people and they face sewerage problems.

Air quality.
The policy of Cyprus regarding the air quality has as main target the prevention, the reduction and the control of atmospheric pollution, so that the best possible protection of health and prosperity of civilians and the protection of the environment is safeguarded. The achievement of this target is pursued with the successful implementation of the relevant legislation, the existence of a complete prevention and control system, which includes the licensing of the air emission sources, the systematic monitoring of their operation with on-site inspections and measurements of emissions as well as the constant monitoring of the air quality.

Energy.
Furthermore, target of the energy policy is the creation of the necessary infrastructure which will enable the fulfillment of the additional energy needs and the use of alternative and renewable energy sources with main purpose the protection of the environment. Eventually, the use of natural gas is promotes not only for environmental but also for other purposes, especially after the recent finding of reach natural gas deposits in the sea South of Cyprus.

2.2.2. Responsibility of Governmental Services

The Council of Ministers has the general responsibility for the environmental policy in Cyprus. The coordination of this policy is achieved mainly by the Minister of Agricultural, Natural Resources and Environment. For some issues, coordination is accomplished also by the Minister of Labour, Welfare and Social Insurance and the Minister of Interior.

The following Governmental Services are responsible for issues which are related with the environment and especially with the POPs:

- The **Directorate General for European Programs, Coordination and Development**, with the following roles:
  - the configuration and the coordination of the development policy and the governmental work with the aim to restart of the economy, utilising fully the European programmes and funds
  - the coordination and the monitoring of the implementation of the governmental program and the measures of the Memorandum of Understanding
  - the promotion of targeted development measures based on the modern economic policies
  - the on-time and correct programming and the successful management of the European Funds and Programs

- The **DLI** of MLWSI has, among others, the responsibility for the implementation of Laws for the atmospheric pollution control as well as the atmospheric air quality and the control and the management of dangerous chemical substances. The DLI has also the responsibility for the implementation of the European

Regulation 850/2004/EC for the POPs, the European Regulation 1907/2006/EC (REACH), the European Regulation 304/2003 for the import and export of dangerous chemical substances and the ratified Laws of Rotterdam Convention (PIC) in relation to the dangerous waste and pesticides, the Stockholm Convention for POPs, the Protocol of Geneva Convention of 1979 for the transboundary Pollution of the Atmosphere caused by the POPs and the Convention of Large Scale Accidents.

- The **Department of Environment (DE)** of the Ministry of Agriculture, Natural Resources and Environment coordinates the programs for the environment. It has the responsibility for the environmental impact assessments, the laws for the pollution control of the water and the ground, the waste management and the protection of the nature. It is also a focal point for the Basel Convention for the transboundary transfer of dangerous waste, the Vienna Convention and the Protocol of Montreal for the substances which destroy the ozone layer, the Archous Convention for the public access to information relevant to the environment etc.

- The **Department of Agriculture (DA)** of the Ministry of Agriculture, Natural Resources and Environment is responsible to develop the agricultural and stockbreeding sector through the education and the guidance of the farmers. The regulation of the correct use of fertilisers and pesticides as well as the control of the residues in the fodders (MRLs) is also a responsibility of DA.

- The **Geological Survey Department (GSD)** of the Ministry of Agriculture, Natural Resources and Environment, undertakes research and studies regarding the underground water resources, the minerals and the geology.

- The **Department of Fisheries and Marine Research (DFMR)** of the Ministry of Agriculture, Natural Resources and Environment is responsible for the viable management of the fishery reserves, the development and the viable management of aquiculture, the prevention and the control of the pollution of the sea and the improvement of the fishery infrastructure.

- The **Forest Department (FD)** of the Ministry of Agriculture, Natural Resources and the Environment is responsible for the administration, management and protection of the forests as well as for the implementation of the forest policy and legislation. The FD is also responsible for the implementation of the Forest Law 2012.

  Clauses of the Forest Legislation prohibit the set up of fire or the abandonment of fire or the throw-off of lit match or cigarette in the forest or in 2 km distance from the boundary line of the forest.

- The **Water Development Department (WDD)** of the Ministry of Agriculture, Natural Resources and the Environment is responsible for the management and monitoring of the water resources.

- **The State General Laboratory (SGL)** deals, among others, with chemical analysis of food, water (including the treated wastewater), environmental samples and consumer goods such as medication, cosmetics, children toys etc. The main purpose of the specialized food labs of the SGL covers the monitoring

and applied research in several sectors, including the examination of existence of various pollutants such as the POPs in water, food, air and treated wastewater.

- **The Public Health Services (PHS)** of the Ministry of Health is the competent authority for the implementation and control of the legislation for the food, including the potable water. For this reason, the PHS collaborates with all interested services to develop a general and complete policy for the protection of safety of food and potable water.

- The **Ministry of Energy, Commerce, Industry and Tourism** which deals with issues for the energy conservation, the promotion of renewable energy sources and the management of plans for the fund granting regarding the protection of environment from industrial pollution.

2.2.3. International Commitments and Responsibilities.

POPs Protocol

Cyprus Government, after the decision of the Councils of Ministers dated 11th June 1991, accessed in the Geneva Convention of 1979 for the Transboundary Atmospheric Pollution on Long Range. Under the framework of the Convention 8 protocols have been issued. One of them, the Protocol of Geneva Convention 1979 for the Transboundary Atmospheric Pollution on Long Range caused by POPs (Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants (POPs)), was signed in Archous of Denmark in the 24th June 1998, under the framework of European Conference of Ministers of Environment.

The above Protocol refers to the responsibility of its members to receive the necessary and successful measures for the control of POPs and the reduction of their annual emission.

EU Regulation 850/2004

On the 30/4/2004 EU issued the Regulation 850/2004 for POPs. The Regulation's target was to fulfill the responsibilities of the member states regarding the Protocol of Stockholm Convention for the protection of the environment and human health from POPs.

The main responsibilities of the member states of the EU derived from the Regulation 850/2004 are:

a) Complete prohibition of the production and use of the chemical substances of Annex I of the Regulation, which includes pesticides and other chemical substances already banned in Cyprus.
b) Preparation of an inventory of POPs emissions and development of a National Implementation Plan for their reduction.
c) Submission of the National Implementation Plan to the European Committee (EC).
d) Notification to the EC of the rules that the member states have to enact for the penalties in the cases of the infringement of the Regulation.

e) Designation of a competent authority for the implementation of the Regulation and notification to the EC.

Competent Authorities for the implementation of the provisions of the Regulation are the Ministers of Labour, Welfare and Social Insurance and Agriculture, Natural Resources and Environment. The Minister of Labour, Welfare and Social Insurance has been designated as a coordinator and focal point for Cyprus with the EC.

PIC Convention

Cyprus, as a member state of the EU, has signed on the 11th of September 1998 and accessed on the 17th of December 2004 to the PIC Convention (Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade). The Convention took effect for Cyprus in 17.3.2005. The EU renders the ratification of the PIC Convention liable by the member states, based on the EU Regulation 304/2003. By this Regulation, in correspondence with PIC Convention, chemicals and products are designated for which the member states must determine a Competent Authority for the exchange of information with other competent authorities regarding their import and export.

The PIC Convention introduces limitations to the import and export of some dangerous chemical substances and pesticide products (39 total agricultural pesticides and chemical substances) creating a mechanism of exchange of information of the relevant states in the cases where there is import or export of one of these products.

Specifically, with the above Convention the following are determined:

- A list of chemical substance group which are considered very dangerous for human health or the environment and are subjected to accession procedure after information.
- The accession procedure regards to the mechanism of exchange of information of the relevant countries in the cases where there is import or export of a substance covered by the Convention.
- The accession procedure of additional chemical substances in this list.
- The notification procedure for the export of a prohibited chemical substance or is under austere limitations in the territory of a member state of the Convention.
- The information which accompany the exported chemical substances and the procedure for the exchange of these information between the relevant countries.
- The prerequisites for the implementation of the Convention's provisions and the procedures followed in the case of non-conformance.
- The procedures for the operation of the Conference of the Secretary's members, the procedure for the arrangement of the differences between the member states of the Convention and the procedure for the modification of the Convention.

The Competent Authority for the implementation of the provisions of the PIC Convention is the Minister of Labour and Social Insurance through the Department of Labour Inspection. In case issues related to plant protection products arise, the Competent Authority forwards them to the Department of Agriculture of the Ministry of Agriculture, Natural Resources and Environment.

Basel Convention

Basel Convention refers to the control of transboundary transport of dangerous waste. Cyprus signed the Convention in 22.3.1989 and ratified it in 17.9.1992. Competent Authority for the implementation of the Convention provisions is the Minister of Agriculture, Natural Resources and Environment through the Department of Environment.

Other activities.

Cyprus participates also in the activities of the following International and European Organisations, Programs and Committees:

a) European Union Network for the Implementation and Enforcement of Environmental Law - IMPEL
b) Committee for the implementation of Regulation 166/2006 for the development of European Pollutant Release and Transfer Register – Directive for the Integrated Pollution Prevention and Control- IPPC (96/61/EC), article 19 (European Pollutant Release and Transfer Register)
c) European Information and Observation Network of the European Environment Agency - EIONET
d) Executive Body of Geneva Convention (1979) - Convention on Long-range Transboundary Air Pollution
e) Steering Body of EMEP Protocol - European Monitoring and Evaluation Programme.
f) IFCS – Intergovernmental Forum of Chemical Substances.
g) SAICM – Strategic Approach to International Chemicals Management.
h) European Organisation of Chemical Substances
i) International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

2.2.4. Existing legislation related to POPs.

The issue of POPs' control in Cyprus is regulated directly or indirectly by the following Laws:

International responsibilities:

- The Law 29(III)/1992 for the Basel Convention regarding the Control of the Transboundary Transport of Dangerous Waste and their Disposal (Ratified) Law of 1992.
- The Law 39(III)/2004 for the Protocol of the Convention of 1979 regarding the Transboundary Atmospheric Pollution on Long Range caused by POPs (Ratified) Law 2004.
- The Law 42(III)/2004 for Stockholm Convention regarding POPs (Ratified) Law 2004.
- The Law 20(III)/2004 for Rotterdam Convention regarding the Accession Procedure after Information for Certain Dangerous Chemical Pesticide Products in International Trade (Ratified) Law 2004.

European responsibilities.

- EU Regulation 850/2004 for POPs, which has the aim to protect human health and the environment from POPs determined in the above Protocol and Stockholm Convention..

- EU Regulation 304/2003 for the import and export of dangerous chemical substances.
- Regulation 1907/2006/EC for the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- Regulation 166/2006/EC for E-PRTR.
- Directive 2002/32/EC of European Parliament and the Council for the unacceptable substances in fodders.
- Directive 2011/65/EC for the restriction of the use of certain dangerous substances in electrical and electronic equipment.

National Legislation.

Waste management

- Waste Law 2011 (185(I)/2011) to 2014 (6(I)/2012, 32(I)/2014, 55(I)/2014)
- Solid and Hazardous Waste (Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT) Regulations, 2002 (636/2002)
- Enactment 157/2003 for the Solid and Dangerous Waste (List of Waste) 2003
- Enactment 158/2003 for the Solid and Dangerous Waste (Waste Registry) 2003
- Regulations for the solid and dangerous waste (Landfill sites) 2003 to 2014 (562/2003, 618/2007 and 147/2014)
- Regulations for the Solid and Dangerous Waste (Electric and Electronic Equipment Waste) 2004 and 2009 (668/2004 and 378/2009)
- Regulations for the solid and dangerous waste (Electric columns or/and accumulators) 2009 and 2012 (P.I. 125/2009 and 79/2012)
- Enactment 188/2013 for the Waste Laws (General terms of Waste Management for a person who deals with the collection and transport of waste) 2013
- Enactment 187/2013 for the Waste Laws (Application for granting waste management license) 2013
- Notification 443 for the Waste Laws (Ceiling and type of guarantee for granting waste management license) 2013
- Amendment of Waste Law 6(I)/2012

Dangerous Chemical Substances – Pesticide products.

- Law 78(I)/2010 for Chemical Substances 2010
- Regulations 324/2010 for the Chemical Substances (Classification, labelling and Packaging of Dangerous Substances and Mixtures) 2010
- Law 141(I)/2011 for the Pesticide Products 2011
- Regulations 615/2003 for the Agricultural Waste (Sale, production and storage) 2003
- Law 72(I)/2004 for the Biocides 2004

<u>PCBs</u>

- Solid and Hazardous Waste (Polychlorinated Biphenyls and Polychlorinated Terphenyls (PCB/PCT) Regulations, 2002 (636/2002)
- Regulation for the waste (Restriction of the use of certain dangerous substances in electric and electronic equipment 2014 (203/2014).

Atmospheric emissions.

- Law regarding the Control of the Pollution of the Atmosphere 2002 (2) to 2013
- Regulations 528/2002 for the Control of Atmospheric Pollution (Prevention and reduction of Atmospheric Pollution from Asbestos) 2002
- Regulations 529/2002 for the Control of Atmospheric Pollution (Burning of Used Mineral Oils) 2002
- Regulations 76/2003 for the Control of Atmospheric Pollution (Control of Emissions of Volatile Organic Compounds from the Storage of Petrol and its Supply in Petrol Stations) 2003
- Amendment Regulations 198/2008 for the Control of Atmospheric Pollution (Unlicensed Installations) 2008
- Amendment Regulations 219/2013 for the Control of Atmospheric Pollution (Unlicensed Installations) 2013
- Regulations 2004 for the Control of Atmospheric Pollution (Restriction of Some Emissions from Large Combustion Plants) 2004 (195/2004)
- Regulations 75/2003 for the Control of Atmospheric Pollution (Prevention of Atmospheric Pollution caused by the Existing Installations of Domestic Waste Combustion) 2003
- Law regarding the Industrial Emissions (Integrated Pollution Prevention and Control) 2013

Water - Land

- Law 106(I)/2002 for the Control of Water and Land Pollution 2002
- Regulations 504/2002 for the Control of Water pollution (Deposit of Dangerous Substances) 2002
- Regulations 513/2002 for the Control of Water pollution (Deposit of Dangerous Substances in Groundwater) 2002
- Regulations 513/2002 for the Control of Water Pollution (Pollution from Dangerous Substances) 2002
- Law 13(I)/2004 for the Protection and Management of Water 2004
- Integrated Pollution Prevention and Control Law 56(I)/2003
- Law 113(I)/2010 for the Protection and Management of Water (Amendment) 2010
- Regulations 484/2010 for the Control of Water Pollution (Environmental Quality Standards in the Water Policy Sector) 2010
- Enactment 500/2010 for the Protection and Management of Water (Environmental Quality Standards in the Water Policy Sector)2010

<u>Fodders</u>

- Laws 1993-2007 for the Fodders and Additives in the Fodders (Control of Quality of Supply and Use)
- Regulations 2001-2010 for the Fodders and Additives in the Fodders (Control of Quality of Supply and Use)

2.3. Evaluation of the issue of POPs in Cyprus.

2.3.1. Pesticide products (including DDT).

The Department of Agriculture of the Ministry of Agriculture, Natural Resources and Environment applies a series of laws in Cyprus which refer to the registration, import, production, quality, use and generally the trade of pesticide products and biocides. The pesticide products are regulated with law which is harmonised with corresponding EU legislation.

As a result of the application of the above legislation in Cyprus, the placing on the market and the use of plant protection products that contain substances, some of which are listed in Annexes A and B of the Stockholm Convention have been prohibited. Even before the adoption of the European Acquis, from the decade of the 1980s, specific plant protection products that were available on the market in Cyprus were withdrawn after a decision of the Pesticides Authorization Board while certain others, that are also listed in Annex A of the Stockholm Convention, have never been introduced into the market.

Specifically, the Following **Table 1** shows the agricultural pharmaceuticals and biocides included in Annexes A and B of the Convention and their circulation and use is prohibited in Cyprus. It is noted that none of these chemical substances is ever produced in Cyprus. This list is of knowledge of the Customs and Excides Department for the control of chemical substances imported in Cyprus.

Table 1: Agricultural pharmaceuticals and biocides

Chemical substance name	CAS number	Date of prohibition
Aldrin	309-00-2	8.12.1980
Chlordane	57-74-9	8.2.1988
Dieldrin	60-57-1	8.12.1980
Endrin	72-20-8	The use as a pesticide product has never been granted
Heptachlor	76-44-8	The use as a pesticide product has never been granted
Hexachlorobenzene	118-74-1	The use as a pesticide product has never been granted
Mirex	2385-85-5	The use as a pesticide product has never been granted
Toxaphene	8001-35-2	The use as a pesticide product has never been granted
Polychlorinated biphenyls (PCBs)	1336-36-3 και άλλοι	21.6.2002
DDT	50-29-3	1.12.1976

Chemical substance name	CAS number	Date of prohibition
Alpha hexachlorocyclohexane	319-84-6	
Beta hexachlorocyclohexane	319-85-7	
Chlordecone	143-50-0	
Lindane	58-89-9	
Pentachlorobenzene	608-93-5	
Technical Endosulfan and its related isomers	115-29-7	

2.3.2. Polychlorinated Biphenyls (PCBs), Polybrominated Biphenyls (PBBs), Polybrominated Biphenylethers (PBDEs).

The PCBs threaten the environment due to their toxicity, their lack of biodegradation and their characteristic to bioaccumulate in the animal tissues. In Cyprus, PCBs have never been produced, while their use has gradually been restricted from early 1970.

It is well known fact that PCBs remaining in existing equipment such as transformers' oils, continue to be a threat for the environment. In this respect, Directive 96/59/EC regarding the circulation of PCBs establishes prerequisites for the preparation of lists for the marking and the treatment of PCBs. Cyprus is harmonised with the above Directive with the institution of the Regulations 636/2002 for the Solid and Dangerous Waste (Polychlorinated Biphenyls and Polychlorinated Triphenyls (PCB/PCT) .The main provisions of this Directive and the Regulations are the following:

(α) the responsibility for the appropriate disposal, until 2010, of all the devices which include PCBs with volume greater than 5 dm^3 (article 3 of the Directive)·

(β) the continuation of the use of these devices which they can be considered to have liquids containing PCs between 0,05% (500 ppm) and 0,005% (50 ppm), until the end of their lives. Equipment, which includes PCBs' concentration greater than 50 ppm has to be included in a list and be marked (article 4(2) and 9(2) of the Directive).

(γ) the replacement of the liquid is allowed with the prerequisite that this liquid contains PCBs less than 0,05% and preferable less than 0,005% while its fill is prohibited.

Recognising the environmental problems caused by the PCBs, Cyprus Government, since 1987, has prohibited the import of oils or equipment which includes oils containing PCBs. In Cyprus, such equipment has never been produced. A certificate of chemical analysis is needed by an approved laboratory for the import of transformers from an accredited laboratory which ensures that the transformers' oil is free of PCBs.

Based on the Regulation 9(1) of 2002 for the Solid and Dangerous Waste (Polychlorinated Biphenyls and Polychlorinated Triphenyls) (PCB/PCT) a National Implementation Plan and a General Guidance are formed for the Management and the destruction of PCBs/PCTs in Cyprus. The Plan has been published with notification of the Minister of Agriculture, Natural Resources and Environment in the official newspaper of the Republic in 8.12.2006 (Regulation 456/2006). In this Plan, there are actions taken by Cyprus Government for the establishment of a list for the owners of transformers having PCBs and their relevant decontamination. In addition, it includes the procedure for the gradual collection and correct environmental management of PCBs, the list for the owners of transformers having PCBs and their responsibilities relevant to the legislation (relevant is the paragraph 2.3.4.2 below and Annex II).

The Regulations for the waste (Restriction of the use of certain dangerous substances in electric and electronic equipment) 2014 (203/2014) determine regulations for the restriction of the use of dangerous substances in electric and electronic equipment (EEE) with the aim to contribute for the protection of human health and the environment, including the recovery and the disposal of these waste with correct environmental way.

Among the substances under the restriction are the PBBs, PBDEs having maximum allowable concentration by weight 0,1%. The regulations include provisions which are focused to the obligations regarding the manufacturer, the licensed representative, the importer and the distributor. The most significant demands of these provisions are (i) the creation of a technical folder by the manufacturer in the framework of the Law for the CE marking and (ii) the supervision of the market based on the Regulation 765/2008 EC regarding the determination of the accreditation demands and the supervision of the market regarding the trade of the products.

2.3.3. Emissions from unintentional production.

Dioxines/Furans

Dioxins is the name of a group of very toxic polychlorinated chemical substances, which are mainly produced during burning. The group of dioxins is comprised by 75 types of polychlorinated-dibenzo-p-dioxins (PCDD) and 135 types of polychlorinated-dibenzo-furans (PCDF).

The toxicity of theses chemical compounds defers in relation to the number and the position of chlorines atoms they contain. The most toxic type of dioxins and furans is the 2,3,7,8-tetrachlorodibenzo-p-dioxine (2,3,7,8-Cl_4DD, which has toxicity coefficient 1. This dioxin, as well as the remaining most toxic types of dioxins with the corresponding toxicity coefficients is shown in **Table 2**. In this table, the initial international toxicity coefficients (1990) as well as the more recent, which were prepared by the World Health Organisation (WHO) in 1998.

Because the different types of dioxins and furans have different toxicity, the emissions which consist of a dioxins' mixture are expressed as TEQ (Toxic Equivalents) i.e. «equivalent toxicity». The «equivalent toxicity» correlates the toxicity of all the dioxin and furan types with the toxicity of 2,3,7,8-Cl_4DD.

Although dioxins are also formed from natural sources (such as forest fires) the main interest is focused on the emission of dioxins from human sources especially during combustion of various fuels and the incineration of waste.

In 2002, the General Director of Environment of the EC has decided the implementation of a Plan for the inventory of dioxin emission regarding the countries under accession with the aim to compare them with emissions of the old countries. The implementation of this Plan lasted for two years, from 2002 to 2004, during which two workshops as well as measurements in different industrial installations were organized. The DLI was represented in these two workshops and it proceeded in measurements of dioxin emission in two industrial installations in Cyprus. It was the first time where a detailed inventory of dioxin emissions was carried out in Cyprus with the use of the emissions factors taken from the UNEP Standardised Toolkit for Identification and Quantification of Dioxin and Furan Releases.

Table 2: Coefficients of Equivalent Toxicity of Dioxins/Furans and PCBs similar to dioxins WHO-TEF (2005), as referred in the Regulation 1881/2006 of the EC.

Cognate substance	TEF value (WHO – TEFs, 2005)	Cognate substance	TEF value (WHO – TEFs, 2005)
Dibenzo-p-dioxins ("PCDDs")		«Similar to the dioxins» PCBs Non-ortho PCBs + Mono-ortho PCBs	
2,3,7,8-TCDD	1	*Non-ortho* PCBs	
1,2,3,7,8-PeCDD	1	PCB 77	0.0001
1,2,3,4,7,8-HxCDD	0.1	PCB 81	0.0003
1,2,3,7,8,9-HxCDD	0.1	PCB 126	0.1
1,2,3,6,7,8-HxCDD	0.1	PCB 169	0.03
1,2,3,4,6,7,8-HpCDD	0.01		
OCDD	0,0003		
Dibenzo-furans ('PCDFs")		*Mono-ortho* PCBs	
2,3,7,8-TCDF	0.1	PCB 105	0.00003
1,2,3,7,8-PeCDF	0.03	PCB 114	0.00003
2,3,4,7,8-PeCDF	0.3	PCB 118	0.00003
1,2,3,4,7,8-HxCDF	0.1	PCB 123	0.00003
1,2,3,7,8,9-HxCDF	0.1	PCB 156	0.00003
1,2,3,6,7,8-HxCDF	0.1	PCB 157	0.00003
2,3,4,6,7,8-HxCDF	0.1	PCB 167	0.00003
1,2,3,4,6,7,8-HpCDF	0.01	PCB 189	0.00003
1,2,3,4,7,8,9-HpCDF	0.01		

During the period of this study, the DLI acquired the necessary equipment for the sampling of dioxins from point emission sources.

The Inspectors of the DLI were initially trained for the use of this equipment according to standard EN 1948 – 1 by the supplier of the equipment. The consortium that carried out the above study (TNO from the Netherlands, IUTA from Germany, IOW from France and SHMU from Slovakia) arranged for the visit to Cyprus of an Austrian expert from the Federal Environmental Protection Agency of Austria (Umweltbundesamt GmbH) who provided further training to the Inspectors during the first sampling for dioxins at a cement factory. A second sampling was carried out at a power station. All the samples that were taken were sent to the laboratories of Umweltbundesamt GmbH in Vienna for analysis. The reports with the results of these emission measurements were included by TNO and IUTA in their final report which was submitted to the European Commission and is available on the web page:

http://ec.europa.eu/environment/dioxin/pdf/rapport_2005.pdf

As a result of this study the first dioxin inventory for emissions to the atmosphere was prepared for the year 2002, which was subsequently extended for all years since 1990. For the calculation of the emissions the activity data for industrial sources (production and fuels) were used. An estimation of the quantities of materials (wastes, agricultural residues, forests etc) that are burned in an uncontrolled way was also made.

The results of the emission inventory of dioxin emissions for the period 1990 to 2011, is shown in **Figures 2 to 4**. **Figure 2** shows the dioxin emissions in the atmosphere.

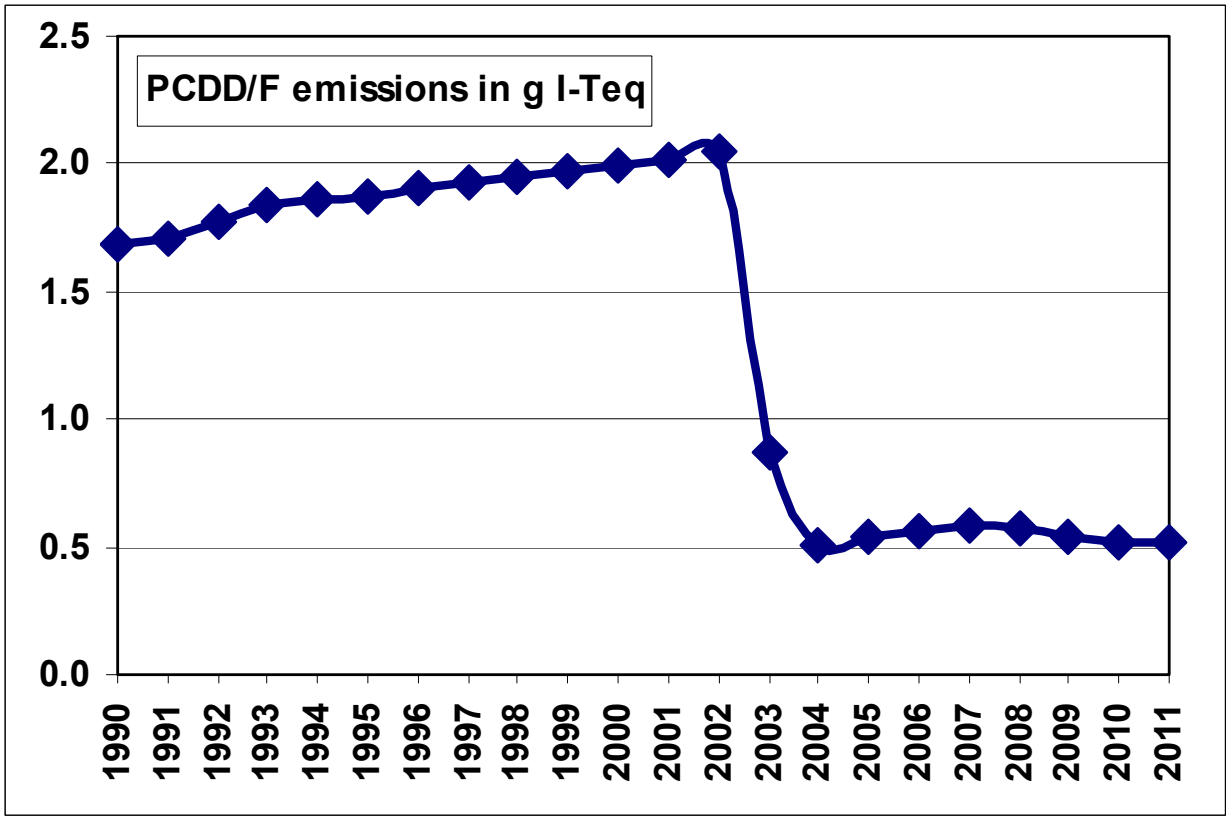


Figure 2: Dioxin emissions in the atmosphere in the period 1990 - 2011

In **Figure 3**, the atmospheric emissions from four general categories are presented. The four categories include the combustion of different fuels (energy

production and use in vehicles), the industrial sources, the uncontrolled open burning and the incineration process.

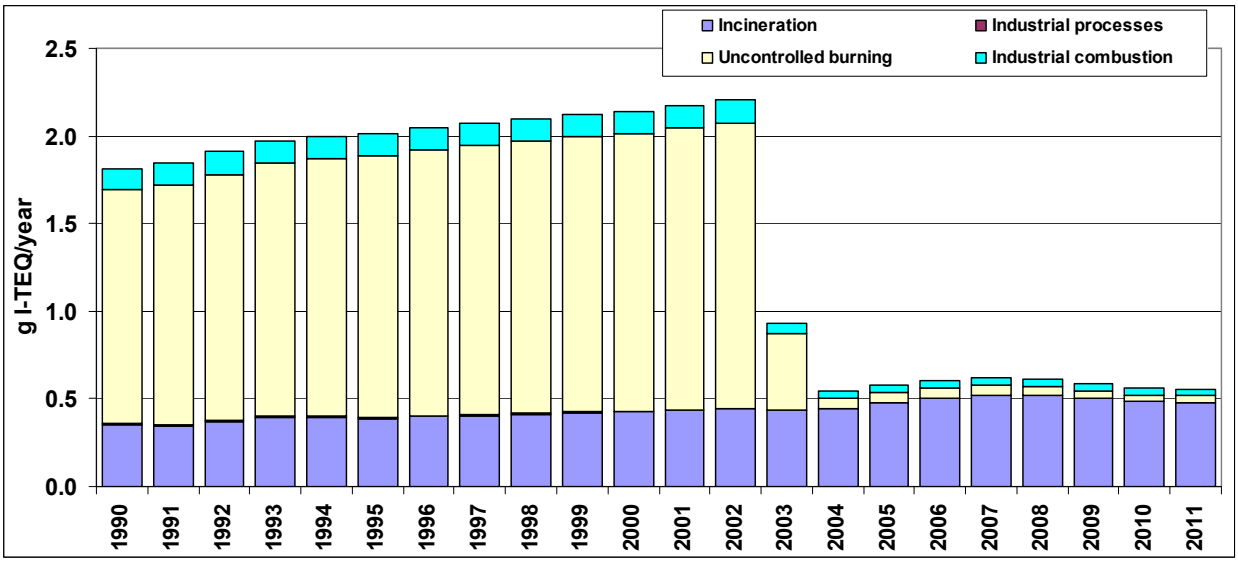


Figure 3: Dioxin emissions in the atmosphere by category in the period 1990 - 2011

As it shown in Figure 3, the greater dioxin quantity is emitted in the air from the uncontrolled open burnings which include:

(a) burning of municipal waste in open landfills
(b) burning of garden waste and wastes from construction sites in inhabited areas
(c) burning of agricultural waste (wheat stalk residues, trimming of trees, plastic film used in greenhouses and animal carcasses)
(d) bonfires
(e) accidental fires of buildings, cars, etc.

The percentage of dioxins emitted in the atmosphere from uncontrolled fires reaches approximately the 85% of the total for the years 1990 to 2006. With the measures started to be implemented and described below (paragraph 3.3.3), this percentage is expected to be reduced significantly.

The emissions from industrial sources and the combustion of different fuels are constant and in low levels. The emissions from the incineration process are reduced after the 31.3.2003, when the operation of the incinerators of clinical waste, installed in different hospitals, was terminated. Today, the clinical waste are sterilised and then they are landfilled.

Another significant reduction in dioxin emissions is caused due to the process of industrial combustion of dead animals, which, in the past, were burned uncontrolled. The emission factors of dioxins from industrial combustors operating with filters and in continuous basis are very lower than the corresponding factors for the uncontrolled burning.

Figure 4 shows the variation of the dioxin emissions in the atmosphere for the four general categories. From this diagram it is shown clearly that the greater reduction of emissions is achieved by the restriction of uncontrolled burnings.

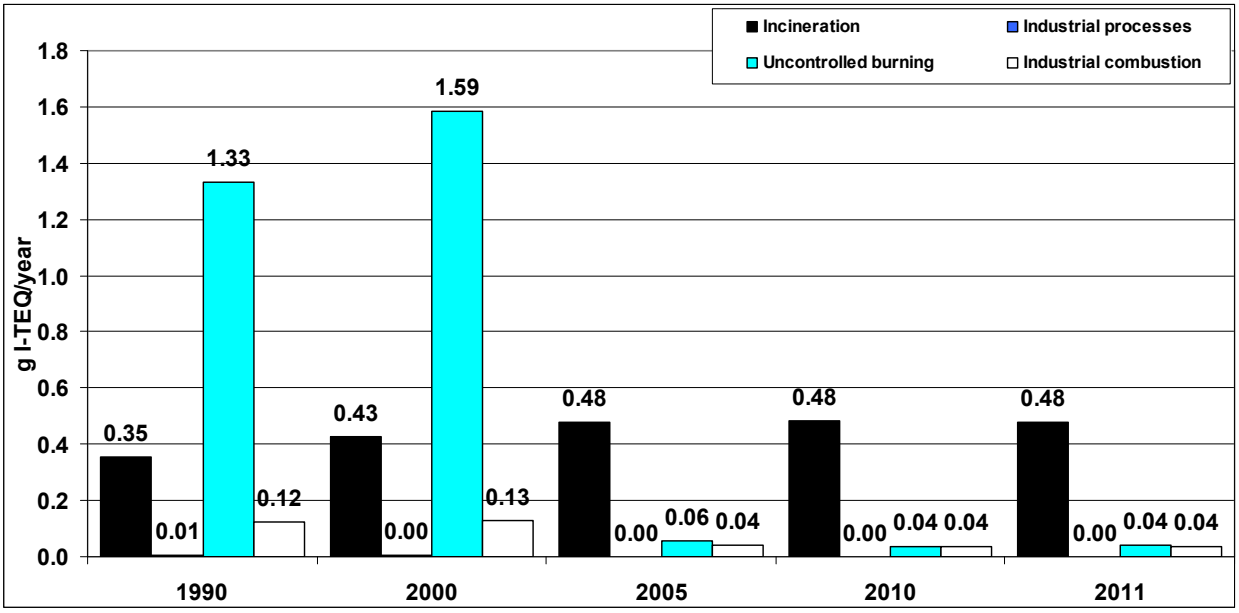


Figure 4: The variation of the dioxin emissions in the atmosphere by category

Hexachlorobenzene (PCBs)

The hexachlorobenzene and the PCBs are emitted in the atmosphere from the combustion processes when the burning material includes chlorine and especially when the combustion is incomplete.

The main emission sources of hexacholobenzene and PCBs are:

(a) the waste incinerators (clinical, municipal, hazardous)
(b) the cement production kilns (clinker)

Other possible emission sources which are included in the Convention are:

(a) the open burning of wastes
(b) the combustion of fossil fuels
(c) the combustion of wood and other biomass
(d) the combustion of animal carcasses

According to the data of the industrial sources regarding the produced products (activity data) as well as the fuels used and the use of emission factors, the emissions of hexacholorobenzene and PCBs in Cyprus were calculated for the years 1990 to 2011. The emission factors were derived from the CORINAIR Guidebook of the European Program of the Control and the Evaluation of Transboundary Pollutants (EMEP/CORINAIR Emission Inventory Guidebook).

It is noted that the number of the emission factors for the hexacholobenzene is limited. Therefore, the inventory for the hexacholobenzene and PCBs show much higher coefficient of uncertainty in relation to inventory of dioxins.

The emissions of hexacholorobenzene are shown in **Figures 5** and **6**. PCBs emissions are shown in **Figure 7**. As it is presented in these figures, the emissions of these pollutants are being reduced since 2007. The main reason is the termination of the open burning of animal carcasses..

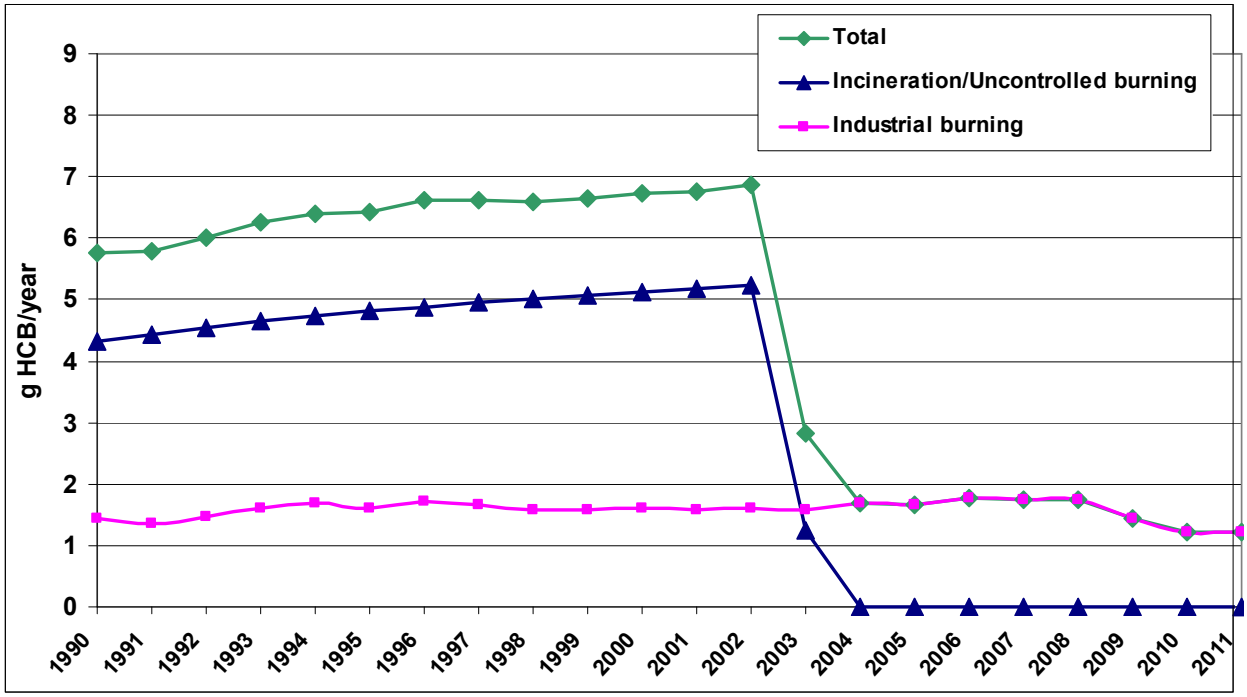


Figure 5: Emissions of hexachlorobenzene

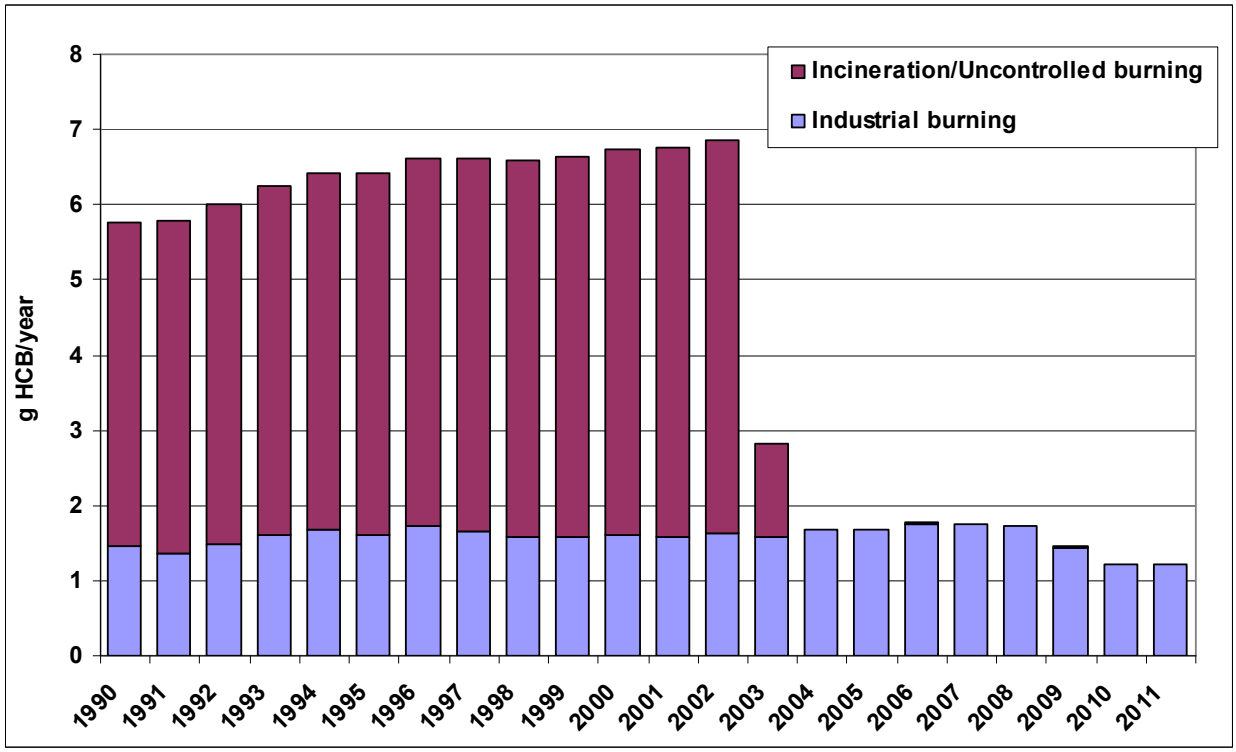


Figure 6: Emissions of hexachlorobenzene

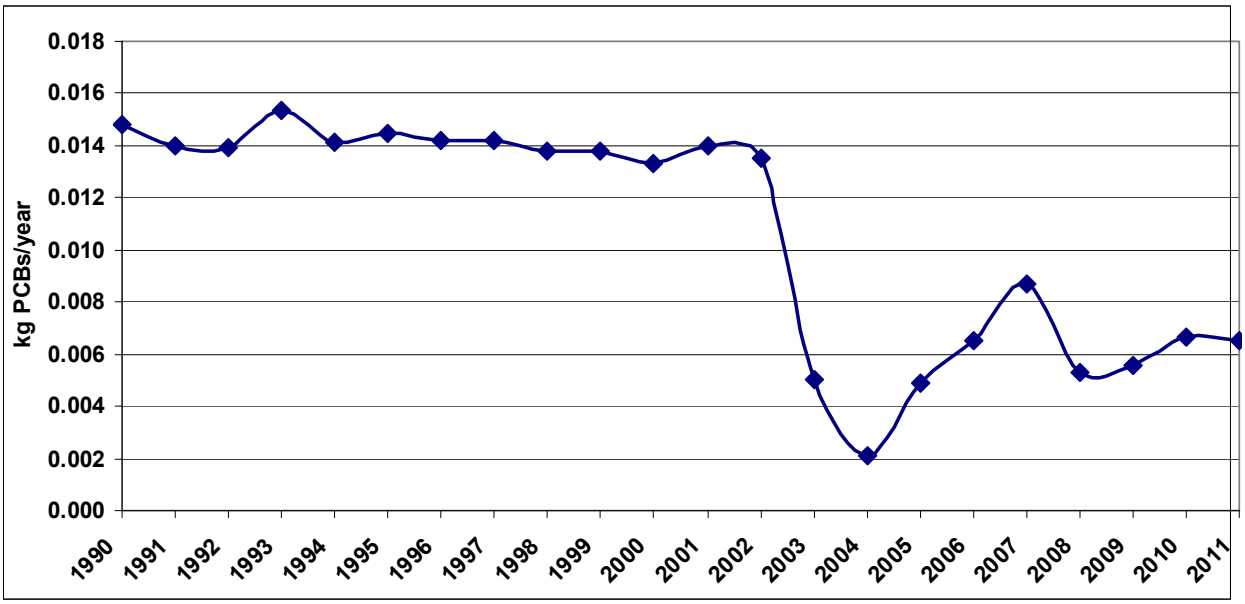


Figure 7: Emissions of Polychlorinated Biphenyls (PCBs)

2.3.4. Stocks

Substances of Annex A and B of the Convention excluding PCBs

According to the records and inspections carried out by the Department of Agriculture in factories and stores of agricultural products, there are no stockpiles of the chemicals listed in Annexes A and B of the Convention. This situation is the result of the policy of the Pesticides Authorization Board which aimed at the use or disposal of the stockpiles of those chemicals using all legal options, during the period that they had to be phased out.

In Cyprus, it was not necessary to implement studies of disposal and destruction of POPs of Annexes A and B, since either these was not circulated in the market or they were withdrawn after the decision of the Council for the Control of Agricultural Pharmaceuticals from the 1980 decade the latest (Table 1, paragraph 2.3.1).

In addition, the above Board, after investigating the stockpiles of all importers, decided to prohibit imports, allowing enough time to consume all stockpiles for special applications. For example, in 1974 when DDT was prohibited for agricultural use, it was allowed to be used as mouse exterminant until all stockpiles were exhausted.

PCBs

The Ministry of Agriculture, Natural Resources and Environment through the Geological Survey Department, completed a study to find any devices that possibly contained PCBs, in public as well as private organisations and businesses. A summary of the study's results was sent to the EC.

In the framework of application of the Regulation 636/2002, a National Action Plan was prepared as it is provided in Article 11 of the Directive. The Ministry of Agriculture, Natural Resources and Environment conducted a study with the aim to locate devices which possibly contained PCBs, not only in public but also in private

organizations and companies. A summary of the results of this study was submitted to the European Committee in 13/9/2005.

The above mentioned study was focused on the possible owners of these devices containing PCBs. For this reason, a questionnaire was prepared which was sent to 660 organisations and companies. A sampling was followed in 60 installations and 149 analyses were carried out (2002) in transformers. Only in one transformer there was an indication of PCB concentration greater of 500 ppm.

Analyses carried out in 2006 following standard procedures of sampling and analyses, showed that this transformer contained PCBs lower than 50 ppm. The last result was confirmed also with analyses carried out in the Governmental laboratory. The results show that this transformer is included in the transformers which are not covered from the Regulation 636/2002 and thus the final result of the inventory is that there was no transformer having PCBs concentration greater than 500 ppm.

Moreover, 40 transformers were found to have PCBs with concentrations 50 – 500 ppm. The content of the capacitors in PCBs can not be found without destroying them. Therefore, a list of capacitors was prepared, which possibly contained PCBs, based in international recognized catalogue of manufacturers. For these devices the provisions of article 9 of the Directive were followed.

During the period 1989 to 1995, based on the environmental policy, the Cyprus Electricity Authority examined all its equipment that possibly contained PCBs. During this procedure, 565 transformers were detected and decontaminated (total 107 tones of liquids)

Dioxins.

There are not any known stocks of waste containing dioxins in Cyprus.

2.3.5. Waste.

The Department of Environment (DE) of the Ministry of Agriculture, Natural Resources and Environment, which has the responsibility for the implementation of the law for the waste management, carried out in 2006 a study for the design of a center for the management of dangerous waste in Cyprus. This center includes:

(a) a unit for the collection, separation and temporary storage of waste
(b) a unit for physicochemical treatment
(c) an incinerator
(d) an area for the sanitary landfill of hazardous wastes.

The results of this study were presented to the relevant Ministers' Committee. In 2010, after guidance this Committee, the DE reexamined the production of dangerous waste in Cyprus as well as the need for their management from the Government. The relevant report, which was presented in a meeting of the Ministers' Committee in June 2011 from the DE, concerned the need of creation of landfill site for dangerous waste in Cyprus. Considering that a reduction of dangerous waste quantities was observed during the last years and combined with the successful control occurring and the operation of private installations for dangerous waste treatment as well as the tendency for the creation of new installations, the Ministers' Committee decided that it is not

necessary at the moment to build an installation for the management or landfill site for the dangerous waste.

The Ministers' Committee decided, also, that the controls regarding the disposal, management and export of waste should be increased and the whole matter is monitored closely and the Committee should be informed accordingly.

During 2014, a total of 10 licensed installations for the Management of Dangerous Waste operate in Cyprus. In addition, some dangerous waste (such as waste from laboratories) is exported for further management. Their export is governed by the Regulation 1013/2006 regarding the transport of waste and the Basel Convention.

2.3.6. Contaminated areas.

In 1986, a quantity of industrial oils from transformers (with the name Askarel) was disposed in the ground near Kato Polemidia area in Limassol. To deal with this matter, the Geological Survey Department arranged the disposal of the contaminated land in specially manufactured sealed tanks in a fenced area. The quantity of contaminated land is estimated to be 30000 cubic meters and the pollution from PCBs ranges between some few mg/Kg to some hundred of units. The greater area of Askarel disposal is shown in **Figure 8**.

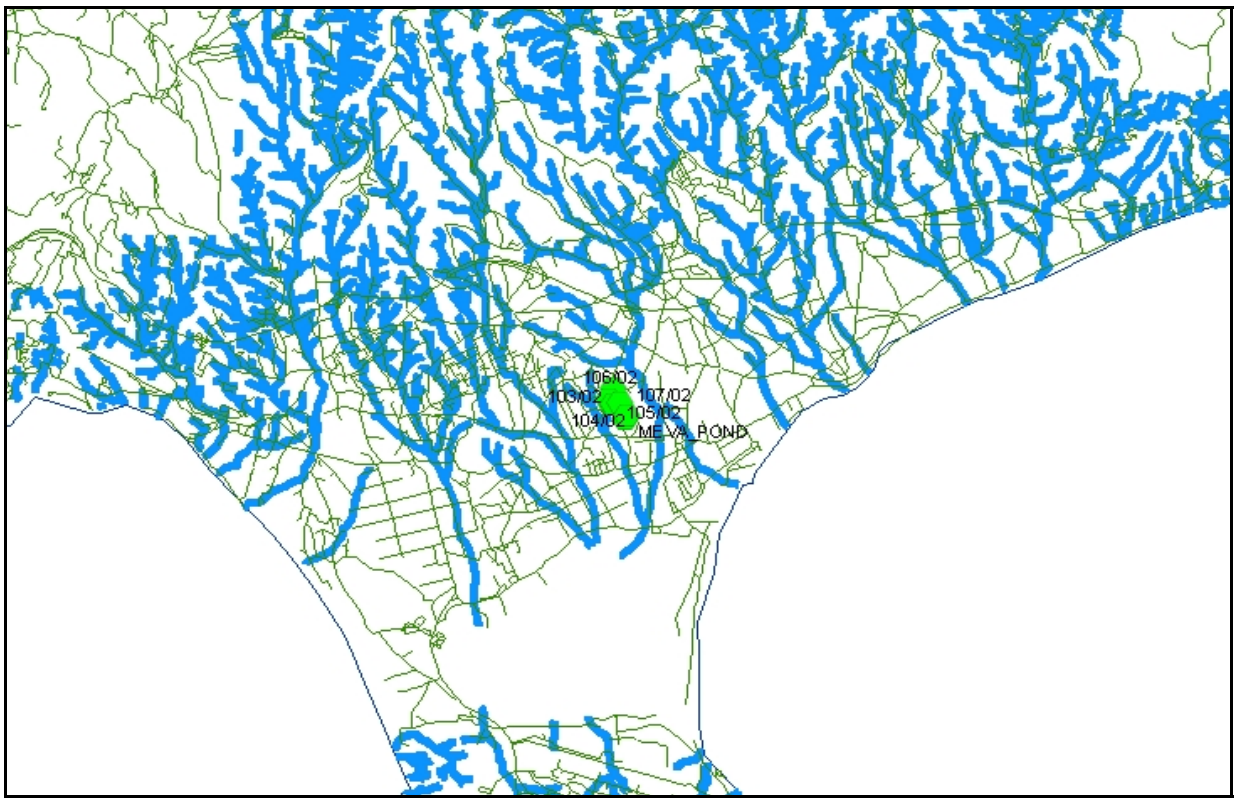


Figure 8: Greater Askarel disposal area.

Form 2000 to 2003, the Geological Survey Department re-examined the Askarel disposal area, with the collaboration of Swedish company, to evaluate the possibility of PCBs leakage from the tanks.

For the monitoring of the Askarel disposal area, a competent Monitoring Committee was established, where the Geological Survey Department participates and is the coordinator. This Committee includes also the General State Laboratory, the DE,

the Water Development Department and the Polemidia Municipality. The Committee meets regularly and examines the results of the monitoring program.

After the decision of the Monitoring Committee of the Askarel disposal area, dated 8 November 2011, the Geological Survey Department established a sampling network for the corresponding disposal land area. In total, the new monitoring network includes sampling of 5 underground water sampling points, a surface water sampling point from the lake where the treated waste of the Installation of Industrial Waste Treatment (MEVA pond) is disposed as well as 5 surface edaphic samples (2 samples inside the fence zone, 1 sample in the entrance of the fence and 2 samples in the circumference (**Figure 9**)

Figure 9: Water and land sampling network in the Askarel disposal area.

In the following **Table 3**, the codes and the coordinates of all the sampling points of the monitoring network are shown.

Table 3: Coordinates of the sampling points of the new monitoring network of Askarel disposal area.

Site	Easting	Northing
BH103/02	36498801	3836725
BH104/02	36498711	3836473
BH105/02	36498810	3836377
BH106/02	36498955	3836415
BH107/02	36499053	3836029
MEVA POND	36499106	3836098
S1	36498870	3836448
S2	36498852	3836392
S3	36458827	3836430
S4	36498758	3836452
S5	36498789	3836767
S6	36498779	3836133

The disposal area is well fenced (**Figure 10**) and marked. The entrance of unauthorised persons is prohibited. The fence and the condition of the area are watched by the Committee.

Figure 10: Askarel disposal area

Figure 11: Observation drill

The Geological Survey Department conducts once a year an inspection of the groundwater pollution and the pollution of the land where the Askarel has been disposed off. The results from the analysis of water show that the condition remains stable in time and there is not any significant pollution of the groundwater and the land by PCBs.

In the case of violation of the Askarel disposal area and leakage or instability of the area, specific actions are followed. The local Authorities notify in time the agricultural land users as well as the inhabitants of the area around 2 kilometres from

the disposal area. Afterwards, the Monitoring Committee take actions according to the event.

The local Authorities (Polemidia Municipality), the Geological Survey Department and the Water Development Department in Limassol have keys of the disposal area.

2.3.7. Identification and Assessment of Chemicals with POP Characteristics

According to Article 8 of the Stockholm Convention, a Party may submit a proposal to the Secretariat for listing a chemical in Annexes A, B and/or C. The proposal is submitted according to the screening criteria given in Annex D of the Convention.

In case any chemical is approved for listing in the future in any of the Annexes of the Convention the relevant national legislation will be amended accordingly to include that chemical.

2.3.8. Monitoring of POPs.

The monitoring of POPs from industrial sources and especially the monitoring of dioxins is accomplished through the implementation of the Law regarding the Control of the Pollution of the Atmosphere 2002 (2) to 2013 and the Law regarding the Industrial Emissions (Integrated Pollution Prevention and Control) 2013 and the relevant Regulations. Based on these Laws, the industrial installations are licensed and the emission limits for dioxin emissions are determined i.e. 0,1 ng I-TEQ / Nm^3 .

From the emission measurements carried out until now by the DLI it was found that the emissions from cement factories and power plants are well below the above limit.

Regarding the matter of POPs effects to human health, the Ministry of Health has carried out health studies, where the levels of PCBs, dioxins and furans in the milk of mothers were measured. It is found that these levels are in normal values.

In addition, the Health Services of Ministry of Health in collaboration with the State General Lab, implement annual programs for the monitoring and control of PCBs and organochlorinated pesticides (OCl's), dioxins and furans in the food and potable water.

The Law for the control of the above substances in food (Regulation 1881/2006/EC and 396/2005/EC) and fodder (Law 2006 for the Fodder and Additives of Fodder (Control of Quality, Supply and Use)) introduces limits of POPs, such as dioxins, PCBs, OCls pesticides in fodder. For this reason, regular inspections are carried out based on the National Law and the EU guidance for the control in the member states.

Since 1988, a program for the control and the monitoring of PCBs and OCls in dam water has been carried out and since 2002 in surface water, based on the relevant legislation. It is noted that in 1988 the control started after the incident of uncontrolled disposal of PCBs in the area of Kato Polemidia. By the evaluation (2004-2012) a reduced trend in PCBs and OCls was found (**Annex I, Figure 1**).

Moreover, since 1983, the General State Lab has started the inspection and monitoring of some POPs included in Annex A, B and C of Stockholm Convention in

food products. The inspection was extended gradually to cover the prerequisites of the existing food Law (Regulation 1881/2006/EC and 396/2005/EC). As an example, in Annex I, the Figures 2 and 3 show the characteristic levels of the summation of dioxins monitored in 2011. It should be noted that the levels of dioxins, furans, PCBs and OCIs in food are much lower than that of the industrial countries of EU.

Furthermore, due to the new demands of the Law (Directives 2000/60/EC 2008/105/EC and 2013/39/EC), the Water Development Department in agreement with the General State Lab, promoted the development of a relevant methodology for the determination of 33 substances of priority (pesticides, Polyaromatic hydrocarbons and metals) in recycled water and sediments was promoted. These substances include chemicals of the Annexes of Stockholm Convention (**Annex I, Table 1**).

2.3.9. Information.

The last years the public has become more sensitive on environmental issues. Regarding POPs, the pollutants that are better known to the public are PCBs and dioxins.

However, in general, the public neglects the dangers from POPs emissions due caused by the uncontrolled waste burning (mainly agricultural and domestic) in inhabited areas and landfill sites. In an effort for the continuation of public information, the DLI organised in 23.11.2007 an event with subject “Presentation of the National Implementation Plan of Stockholm Convention”. In this event all relevant Governmental Services, non-Governmental organizations, ecologic organizations, agricultural organizations, municipalities, unions, the Environmental Committee of the Parliament etc were invited.

In this event, the guests were informed regarding Stockholm Convention and its provisions as well as the National Implementation Plan of the Convention. In addition, the guests were informed regarding the POPs emissions inventory in Cyprus, the waste management and the control of POPs.

Public information was also carried out by the mass media during the press conference of the Minister of Labour, Welfare and Social Insurance, in 4.6.2008. Eventually, a DLI’s officer informed the public regarding the waste burning by participating in Sigma television show in 5.6.2008.

3. STRATEGY AND IMPLEMENTATION PLAN

3.1. Declaration of Policy

Recognising the disfavour consequences of POPs in human health and the environment in general, Cyprus is decisive to take all necessary measures included in the National Plan for the restriction of POPs emissions as provided in Stockholm Convention.

Given the fact that the import and the supply of substances referred to the Annexes A and B of the Convention are prohibited in Cyprus, special emphasis will be given to the control of emissions of chemical substances of Annex C of the Convention and to the safe disposal of the PCBs stocks.

According to article 5(c) of the Stockholm Convention every possible effort will be made to promote the development and, where it deems appropriate, the use of substitute or modified materials, products and processes to prevent the formation and release of the chemicals listed in Annex C of the Convention will be promoted.

Furthermore, according to the provisions of article 5(d) of the Convention, as well as of the provisions of the Control of Atmospheric Pollution Law of 2002 and of the Integrated Prevention and Pollution Control Laws of 2003 and 2006, new processes (especially for the incineration of waste) have to apply the Best Available Techniques (BAT) for the limitation of the emissions of Persistent Organic Pollutants.

The application of BAT and / or best environmental practices is also required for all processes from which POPs may be emitted.

3.2. Strategy of National Implementation Plan

The strategy, which will be followed for the compliance to the basic responsibilities under the provisions of Stockholm Convention, aims to the application of the National Implementation Plan for the management and the destruction of PCBs and the restriction of the uncontrolled burnings to reduce the emissions of POPs since as it is shown from the emissions inventories, this is the main emission source of the pollutants of Annex C of the Convention.

A number of authorities are involved in this subject but the DLI which is responsible for the implementation of the Convention will coordinate all activities carried out for this purpose. The DLI will also continue the campaign to raise public awareness about the effects on the environment and human health from the emission of POPs particularly from open burning.

The prohibition of these burnings is included to the National Action Plan for the improvement of air quality and its implementation is monitored by the competent Technical Committee established by the relevant Law. DLI chairs this Committee where other competent Services also participate.

3.2.1. Emissions from industrial sources.

Regarding the emissions from industrial sources, it is anticipated that these will be stabilised in low levels by the application of BATs through the licensing of industrial

installations, which is achieved based on the Law regarding the Control of the Pollution of the Atmosphere 2002 (2) to 2013 and the Law regarding the Industrial Emissions (Integrated Pollution Prevention and Control) 2013. Moreover, the operation of industrial processes producing fewer or no pollutants, included in Annex C of the Convention, is promoted.

In addition, industrial processes that produce less or no pollutants from those listed in Annex C of the Convention will be promoted. Within this framework the operation of small incinerators that cannot operate continuously will be limited since their emissions of POPs are high due to the frequent start-up and shut-down procedures. As an alternative the installation of a central incinerator for various types of waste operating on a continuous basis will be promoted. As far as the disposal of clinical waste is concerned the sterilization method currently used will continue since it is satisfactory.

3.2.2. Evaluation of the effectiveness of the Convention

Cyprus will contribute towards the effectiveness of the Convention by providing data to the Secretariat based on experiences and knowledge that will be acquired during the implementation stage. In addition, Cyprus will organize special workshops every 5 years for the evaluation of the implementation and the effectiveness of the Stockholm Convention. Adjustments to the Action Plan will be made according to the conclusions of these workshops.

3.2.3. Reports

Cyprus through the DLI has already promptly responded and will continue to respond positively to the submission of reports when required by the provisions of the Convention.

3.2.4. Evaluation/Review of National Implementation Plan

The effectiveness of the National Implementation Plan will be monitored systematically and will be amended according to new information (new sources of emissions, new emission limit values, new emission factors etc.) The revision of the Plan is due to be carried out in five years and it will be carried out by 2019.

3.3. Activities and Actions Programs.

3.3.1. Reduction of production, use, import and export of POPs (articles 3(1) and 3(2) of the Convention)

POPs included in Annexes A and B of Stockholm Convention have never been produced in Cyprus, whereas their import and use is prohibited. The Customs and Excise Department which controls the import of chemical substances in Cyprus is informed about all prohibitions. As a result these substances are not imported or used in Cyprus.

3.3.2. Action Plan for PCBs – Abolition and disposal of equipment containing PCBs.

The action plan, which as referred in paragraph 2.3.2 and described in paragraph 2.3.4, for the equipment that may contain PCBs, is prepared by the DE of the Ministry of Agriculture, Natural Resources and Environment and includes the following:

Decontamination of transformers ascertained to contain PCBs volume greater than 5 dm^3 .

The holder of any transformer detected to contain more that 5 dm^3 of PCBs is obliged to take the following measures:

(a) to declare its possible transfer from the place it was previously placed,

(b) to proceed to its decontamination,

(c) before its decontamination the holder of the transformer has to:

- sample and analyse the liquid in an accredited lab to verify the content of the transformer in PCBs and submit the results to the DE
- inform the DE, at least two weeks before the day that the liquid will be removed, so that an Inspector of DE is present during its removal ·
- obtain the services from a person to whom the holder of the transformer will send the liquid for decontamination/destruction
- submit to the Environment Service evidence regarding the commitment of the aforementioned person to decontaminate the fluid, and also about the relevant permit that this person has, which must be issued by the country in which he operates
- obtain all necessary permits required by the relevant legislation for the shipment of the fluid for decontamination and ensure that shipment will be done within 3 weeks from the day the fluid is removed.
- ensure that the person who will do the decontamination/destruction of the liquid will issue a valid certificate for the completion of the work, which will have to be send to the DE and
- label the transformer, according to the requirements of the Regulation 636/2002.

In case of the final withdrawal of the transformer, in addition to the procedure described in point c above, its owner will have to indicate to the DE the way of its management according to the provisions of the Waste Law 2011 to 2014.

Decontamination of transformers having liquids which possible contain percentage of PCBs between 0,05% and 0,005%

Base on article 9.2 of the Directive 96/59/EC, the holders of transformers which may contain PCBs between 0,05 and 0,005% must either proceed to their decontamination or to dispose them at the end of their lives. The list of the holders of the transformers which have liquids that may contain percentage of PCBs between 0,005% and 0,05% is shown in Table A (Annex II).

Withdrawal of transformer

(a) Three months before the withdrawal of the transformer referred in the list of Table A (Annex II), the holder must inform the DE for his intention to withdraw it.
(b) In case that the transformer will be shipped for decontamination, the holder is obliged, two weeks before its dismantling, to:

- sample and analyse the liquid in an accredited lab, so that to verify the content of the transformer in PCBs and inform the DE for the results
- inform the DE so that its Inspector be present during the dismantling procedure
- obtain all necessary permits required by the relevant legislation for the shipment of the fluid for decontamination and make sure that this will be done within 3 weeks from the day the fluid is removed.
- obtain the services of a person to whom the holder of the transformer will send the transformer for decontamination/destruction
- submit to the DE evidence regarding the commitment of the aforementioned person to decontaminate the fluid, and also about the relevant permit that this person has, which must be issued by the country in which he operates
- ensure that the person, who will decontaminate the transformer, will issue a valid certificate for the completion of the work, which will have to be send to the DE.

Decontamination of transformers

The holder of a transformer that will be decontaminated in Cyprus by the removal of the fluid is obliged to:

- inform the DE, at least two weeks before the day of the liquid's removal, so that its Inspector will be present during the removal.
- sample and analyse the liquid in an accredited lab, so that to verify the content of the transformer in PCBs and isubmit the results to the DE ·
- obtain the services of a person to whom the holder of the transformer will send the it for decontamination/destruction
- submit to the DE evidence regarding the commitment of the aforementioned person to decontaminate the fluid, and also about the relevant permit that this person has, which must be issued by the country in which he operates ·
- obtain all necessary permits required by the relevant legislation for the shipment of the fluid for decontamination and make sure that this will be done within 3 weeks from the day the fluid is removed.
- ensure that the person, who will decontaminate the transformer, will issue a valid certificate for the completion of the work, which will have to be send to the DE.
- label the transformer according to the Annex of the Regulation 636/2002 in case that it will continue to be used. In case that it will be disposed of, it should be disposed of according to the provisions of the Waste Laws 2011 to 2014.

Decontamination/destruction of the capacitors which may contain PCBs between 0,05 and 0,005%

Given that it is not feasible practically to inspect the capacitors for PCBs without being destroyed, the capacitors which may contain PCBs are shown in the list of **Table**

B (Annex II). The holder of these capacitors can keep them until the end of their lives. After this point and three months before their withdrawal, the holder is obliged to inform the DE for his intention. Then, he is obliged to:

- inform the DE so that its Inspector is present during the dismantling procedure ·
- sample and analyse the liquid in an accredited lab, so that to verify the content of the capacitor in PCBs and send the results to the DE
- obtain all necessary permits required by the relevant legislation for the shipment of the capacitor and make sure that this will be done within 3 weeks from the day is disassembled
- obtain the services of a person to whom the holder of the capacitor will send it for decontamination/destruction,
- submit to the DE evidence regarding the commitment of the aforementioned person to decontaminate the capacitor, and also about the relevant permit that this person has, which must be issued by the country in which he operates
- ensure that the person, who will decontaminate/destroy the capacitor, will issue a valid certificate for the completion of the work, which will have to be send to the DE.

Destruction of PCBs

The destruction of PCBs must be done in licensed installations of an EU member state. The transportation of the PCBs in these installations is governed according to the provisions of the Waste Laws 2011 to 2014.

The installations capable to destroy the PCBs or the equipment containing them are included in the relevant list of United Nations (Inventory of World-wide PCB Destruction Capacity), which can be found in the website:

www.chem.unep.ch/pops/

3.3.3. Action Plan for the reduction of unintentional POPs emission

The POPs included in Annex C of Stockholm Convention are emitted in the atmosphere from various industrial installations, non-industrial point sources as well as the uncontrolled burnings.

The Action Plan for the reduction of the emission of these pollutants is prepared by the DLI after the collection of relevant information from all relevant governmental departments and includes the following:

Emission of POPs from industrial installations.

Atmospheric emissions

The atmospheric emissions from industrial installation are regulated based on the Law regarding the Control of the Pollution of the Atmosphere 2002 (2) to 2013 and the Law regarding the Industrial Emissions (Integrated Pollution Prevention and Control) 2013 and relevant regulations.

Basic provisions of these laws is the obligation of the operator of the installation to obtain a permit for the emissions of air pollutants, which determines terms for the

operation and emission limits for various pollutants based on the BATs. Despite the fact that similar Laws are applied since 1991, necessary prerequisite for the grant of this permit since 2002 is the application of BATs. In case that the installation cannot apply the BATs, then it cannot obtain the permit and the operator is obliged to terminate its operation.

One such case was the incinerators of clinical waste of Nicosia, Limassol, Larnaka, Pafos and Kyperounta hospitals, which terminated their operation since 31.3.2003, since they could not comply with the new operating conditions. After this date, the clinical waste were sterilised and disposed off in landfill sites.

All major industrial sources that emit POPs have been granted permits. The operating conditions that were prescribed in the permits are those that are included in the relevant EU Directives. Compliance with the operating conditions and the emission limits which are included in the relevant permits is ensured through inspections and measurements of the concentration of emissions and also through the obligation of the plant operator for self monitoring.

Liquid/solid waste

The disposal of the waste is regulated by the Law 106(I)/2002 regarding the Control of Water and Land Pollution 2002 and the Waste Laws 2011 to 2014.

As referred in part 2.3.4, the only POPs stocks in Cyprus are found in the transformers and capacitors which may contain PCBs. Any waste that can be found in the future to contain POPs will be stored in suitable places for the transportation and treatment abroad, taken into consideration the international Conventions, rules, standards and guidelines. The Minister Committee decided that, at the moment, there is not any need to construct a management installation or a landfill site of such waste. (see 2.3.5).

POPs emissions from non-industrial sources – Uncontrolled burnings.

Combustion of domestic waste in uncontrolled landfill sites

The way of domestic waste disposal in Cyprus was the disposal in different uncontrolled landfill sites, where regularly burning of waste was happening, resulting to POPs emissions in the environment. The aim of the Government is the promotion of the hirerarchy of the waste in the maximum possible way and only the residues from the recovery procedures, which can not be treated, will be guided to the controlled landfill sites. Since 2005, the controlled landfill site of waste in Pafos district is in operation and since 2010 the controlled landfill site of residues in Larnaka-Famagusta district is in operation. It is expected that two additional controlled landfill sites of residues will be constructed to serve Limassol and Nicosia districts and the controlled landfill site of waste in Pafos will be upgraded to controlled landfill site for residues. Competent authority for this issue is the Ministry of Interior.

Also, the Ministry of Interior, after the construction of the controlled landfill site of waste in Pafos and the construction of the controlled landfill site of residues in Larnaka-Famagusta, proceeded to the termination of the uncontrolled landfill sites in Cyprus and it has begun the procedure for their restoration. Therefore, POPs emissions from the uncontrolled burning in landfill sites were minimised.

Burning of agricultural waste.

Until 2002, the disposal of agricultural waste was achieved by the open burning resulting to the emission of various pollutants including POPs. The situation has changed since 2002 with the amendment of the Laws 1988 to 2001 regarding the Prevention of Fires in the Countryside. Based on the Law 109(i)/2002 regarding the Prevention of Fires in the Countryside (Amendment) 2002 the lit of fire is prohibited in any point of the countryside. The lit of fire is only permitted during the month December – January to burn vineyard and fruit-trees residues after the relevant permition from the local authority, as well as to burn sick trees and plants. The burning of canes is not allowed any more and efforts to inform the farmers accordingly are constantly tried.

Burning of dead animals

The practice for the disposal of dead animals from the livestock installations was the burial, the uncontrolled disposal in remote areas or even the on-site burning using used car tires as fuel. The practice of dead animal burning resulted to POPs emissions.

Since the start of 2007, the disposal of dead animals is done by the incineration in a central incinerator using BATs. Also today, the use of the incinerator has stopped and a rendering installation is used instead in the unit of transmutation. In addition, there is the possibility, with appropriate treatment, to convert the dead animals to biogas, which is used for energy production. It is expected that POPs emissions from the burning of dead animals will be reduced significantly.

Burning of waste in inhabited areas.

The burning of waste (trimming, grass etc) in inhabited areas as well as the burning of waste in building under construction (paper and plastic bags, wood etc) is a common practice.

As it is ascertained by research implemented in other countries, POPs emissions from these burnings are significant.

To cope with this issue in Cyprus and after a suggestion made by DLI, a prohibition was enacted in 2008 by the Municipalities Law (article 124 (1A). In order to implement the Law more effectively, an amendment of this Law is forwarded by the Ministry of Interior in collaboration with DLI and the Union of Municipalities so that the Law can be applied extrajudicial.

Therefore, it is expected that the emissions from the burning of domestic waste will be reduced further.

Burning of Biomass in Domestic Boilers.

Domestic heating in Cyprus was initially achieved by burning wood in fireplaces (mainly in mountainous regions) and by the burning of liquefied natural gas and kerosene in small heaters. Subsequently, central heating systems that operate on diesel began to be used on a large scale.

Recently, it was observed that there is a tendency to burn biomass and especially olive seeds as well as wood in domestic boilers for heating purposes. The use of these fuels results in the emission of persistent organic pollutants as well as particulates, especially when combustion is incomplete, as is usually the case with small capacity boilers.

In order to prevent the increase of consumption of wood and other biomass that is used for the purpose of domestic heating through small and inefficient boilers which will result in the increase of the emissions of the pollutants listed in Appendix C of the Convention, DLI has implemented an information campaign to inform the relevant Governmental and non-Governmental organisation for the consequences of these burnings. A series of events is scheduled which aim at raising public awareness about this issue.

The target is the promotion of biomass use in suitable kilns with high yield and low emissions and not the prohibition of its use.

3.3.4. Prevention of the production of chemical substances with POPs characteristics.

The new industrial installations, before they operate, must obtain operation permits from different Governmental Departments. The existing installations are also controlled and permitted. If it is ascertained that any product produced or to be produced, has POPs characteristics, then all appropriate measures can be applied based on the Law 42(III)/2004, which ratifies Stockholm Convention.

3.3.5. Control of chemical substances in use.

The control of chemical substances that are in use is accomplished by the application of enactments and notifications regarding the Dangerous Substances.

3.3.6. Exemptions.

Cyprus has neither applied for nor granted any exemption based on article 3(6) of Stockholm Convention.

3.3.7. Management of stocks, objects in use and waste.

As it has already been referred in part 2.3.4, in Cyprus there are no stocks of chemical compounds included in Annexes A and B of the Convention. There are only devices that may contain PCBs. These devices have been destroyed (based on the Plan in part 2.3.2) and are shown in **Tables A and B** (Annex II). As regards the issue of the waste, part 2.3.5 is relevant.

3.4. Support of Governmental Services and Legislation.

During the preparation of the National Plan, it is shown that the main sectors that need support for purposes of effective implementation are:

Research.

In Cyprus there are not any centres applying research regarding to the mechanisms of pollutant emissions and emission factors so that this information is known. Therefore, at the moment, the relevant information is given by the research results achieved abroad. However, applied science will be promoted with the aim to identify the sources and correlate them with the levels of POPs emissions. Moreover, research regarding the concentration levels of POPs in the different environmental receptors of Cyprus and the consequences in human health will be pursued.

Staffing.

The governmental services, even though they have qualified staff, need support due to the increasing international obligations of Cyprus Government. Recognising this problem, the Government supported the different services with the creation of new employment positions.

Legislation.

The matter of burning in inhabited areas is regulated with the necessary for this scope legislation, which is promoted by the Union of Municipalities.

3.5. Priorities.

The priorities of Cyprus to deal with the obligations created by the implementation of Stockholm Convention are:

Emission factors.

The use of suitable emission factors, especially for the hexachlorobenzene, is a necessary prerequisite for the completion of inventories. By this way a verification and confirmation of the measures that should be taken for the restriction of pollutant emissions included in Annex C of the Convention can be carried out.

Elimination of uncontrolled burnings.

The uncontrolled burnings, especially in uncontrolled landfill sites, have been minimised by their closure/restoration and the construction of suitable controlled landfill sites, which implement the provisions of the relevant EC Directive. The acceleration in the construction of additional such sites consists a priority for the country.

Regarding the combustion of domestic waste in inhabited areas, any possible effort will be tried to promote the extrajudicial regulation of the matter, in the case where the offense of burnings of such waste is carried out inside municipal areas, so that a more effective enforcement of the law is applied.

Until the completion of above activities, the effort for the public information will be continued with different ways regarding the effects of POPs emissions to the environment and human health. The aim is to make the public aware and sensitive about these issues so as to gradually eliminate the practice of open burning.

Centre for the management of dangerous waste

The management of dangerous waste is governed in great extent through the construction of private installations, which have been licensed from the Minister of Agriculture, Natural Resources and Environment.

3.6. Timeframe for the implementation of the National Implementation Plan (NIP).

The main targets for the implementation of the NIP are the following:

Licensing of industrial installations.

Necessary prerequisite for the licensing of industrial installations is the application of BATs. All the above installations are obliged to apply BATs since 30.10.2007 and after.

Construction of controlled landfill sites.

A controlled landfill site of waste has already been constructed and operates in Pafos district since 2005. In addition, in 2010 a CIWT installation for the complete management of domestic waste was put in operation in Kosi, which includes a controlled landfill site for residues, for Larnaka and Famagusta areas. The offers for the CIWT of Limassol district have already submitted and the construction work is expected to be completed until 2016. The uncontrolled landfill site in Vati area will stop operating when the controlled landfill site for residues, which is included in the CIWT of Limassol district, will start operating. The uncontrolled landfill site in Kotsiatis will stop operating when the controlled landfill site in Nicosia district will start operating. After the termination of the uncontrolled landfill sites, their restoration will begin. Already in Pafos (37 uncontrolled landfill sites) the restoration has already started. By this way, it is expected that the uncontrolled waste burning will stop. For the control of the effectiveness of this measure, inspections will be carried out by governmental officers for verification of elimination of the waste burnings.

Implementation of legislation regarding the burning of agricultural waste.

The open burning of agricultural waste has been prohibited as referred in paragraph 3.3.3.

Construction of a centre for the management of dangerous waste.

The relevant Committee of Ministers decided that, at the moment, there is no need for the construction of a unit for the management or a landfill site for the dangerous waste.

3.7 Cost of implementation of measures.

The cost of implementation of measures taken for the restriction of POPs emissions is difficult to be estimated because these measures are not taken exclusively for the purposes of Stockholm Convention's implementation but they are taken for the compliance of other international and local obligations.

As an example, the cost for the construction of the four controlled landfill sites is approximately €200 millions and the cost for the restoration of the existing uncontrolled landfill sites is approximately €50 millions.

The cost for the implementation of the measures for the reduction of the emission limits is not expected to be great because the industrial units affected have already taken suitable measures.

The cost for the installation and operation of the incineration of dead animals is approximately €3,5 millions and the cost for the construction of a central installation for the management of dangerous waste is estimated to be approximately €30 millions.

The remaining legislative measures have relatively small financial cost.

4. Conclusion.

Based on the provisions of the Law 42(III)/2004, which ratifies Stockholm Convention, the National Implementation Plan has to be reviewed every five years with new information regarding the measures taken for the reduction or restriction some chemical substances and the control of their emissions during this period.

Until now, the reviewed data show the Government has taken all necessary measures to the elimination of the use of the chemical substances included in the Convention's Annexes as well as of the control of the emissions from industrial processes, measures for the control of their release in the ground and underwater and surface water and measures for the reduction of open burnings.

However, it is imperative that the implementation of the Convention's provisions and the obligations derived by the current NIP will continue.

ANNEX I

INSPECTION OF WATER AND FOOD SAMPLES CARRIED OUT BY THE GENERAL STATE LABORATORY

A. Inspection of surface water for the presence of POPs.

Under the monitoring of surface water in Cyprus, based on the Law 13(I)/2004 (harmonisation of the framework Directive for the water 2000/60/EC), water samples are analysed for the presence of organic pollutants including POPs.

These samples are checked for the following parameters (**Table 1**).

Table 1: Organochlorinated pesticide products and polychlorinated biphenyls (PCBs) checked in the water

A/A	Organochlorinated pesticide products	A/A	polychlorinated biphenyls (PCBs)
1	**Hexachlorobenzene**	1	**PCB 1**
2	**Heptachlor**	2	**PCB 11**
3	**Aldrin**	3	**PCB 28**
4	Hept-epox	4	**PCB 29**
5	**pp DDE**	5	**PCB 52**
6	**Dieldrin**	6	**PCB 47**
7	**op DDD**	7	**PCB 121**
8	**Endrin**	8	**PCB 101**
9	**op DDT**	9	**PCB 136**
10	**pp DDD**	10	**PCB 118**
11	**pp DDT**	11	**PCB 153**
		12	**PCB 138**
		13	**PCB 185**
		14	**PCB 180**
		15	**PCB 194**
		16	**PCB 206**

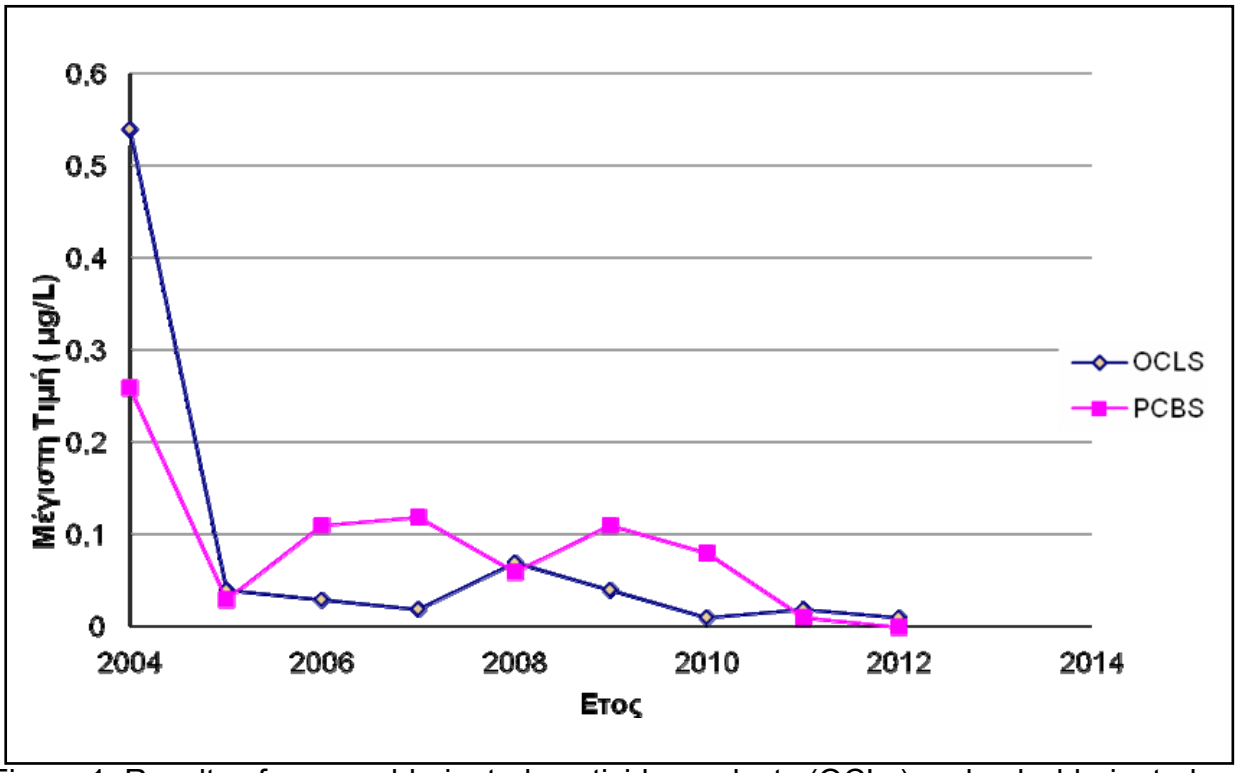


Figure 1: Results of organochlorinated pesticide products (OCLs) and polychlorinated biphenyls (PCBS) in surface water (2004-2012)

B. Food inspection for the presence of organochlorinated products, pesticide products, dioxins, furans and PCBs.

Since 1983, the General Sate Laboratory begun the inspection and monitoring of the levels of some POPs included in Annexes A, B and C of Stockholm Convention in food. The inspection was extended gradually to cover the needs of the existing food law (Regulations 1881/2006/EC and 396/2005/EC). As an example, Figures 2 and 3 show the levels of dioxin summation observed in 2011. It is noted that the levels of dioxins, furans, PCBs and OCls in food in Cyprus are very low as compared with the levels of others industrial countries of the EU and the exposure of the population of Cyprus and other EU countries present a reducing trend. (see EFSA Journal 2012:10(7):2032).

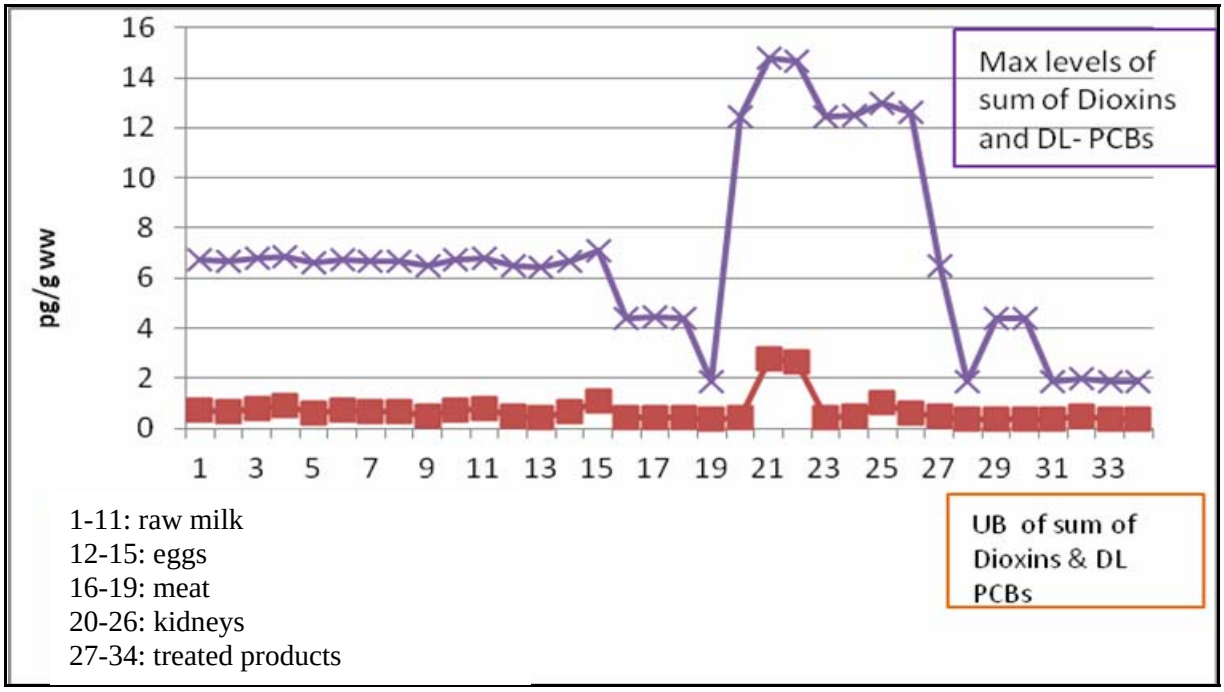
It is noted that the food of vegetable origin is checked systematically, among other pesticide products, for the two main POPs ppDDE and Lindane. For 2005, 171 foodstuff samples were analysed for ppDDE and Lindane and for 2006 215 foodstuff products were analysed. Lindane was not analysed in any of these samples and the percentage of the samples where ppDDE was found does not exceed 2,5%. The defined concentrations were inside the accepted limits.

The foodstuff of animal origin are check mainly for the 15 POPs a- HCH ,b- HCH, Lindane, Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Aldrin, Dieldrin, Endrin, opDDE, ppDDE, opDDD, ppDDD, opDDT, ppDDT and for PCBs 28, 52, 101, 118, 153, 138, 180, 29, 47, 121, 136, 185, 194, 206, 209.

The lab for the inspection of pesticide products and PCBs participates in the following programs for the examination of samples of animal origin:

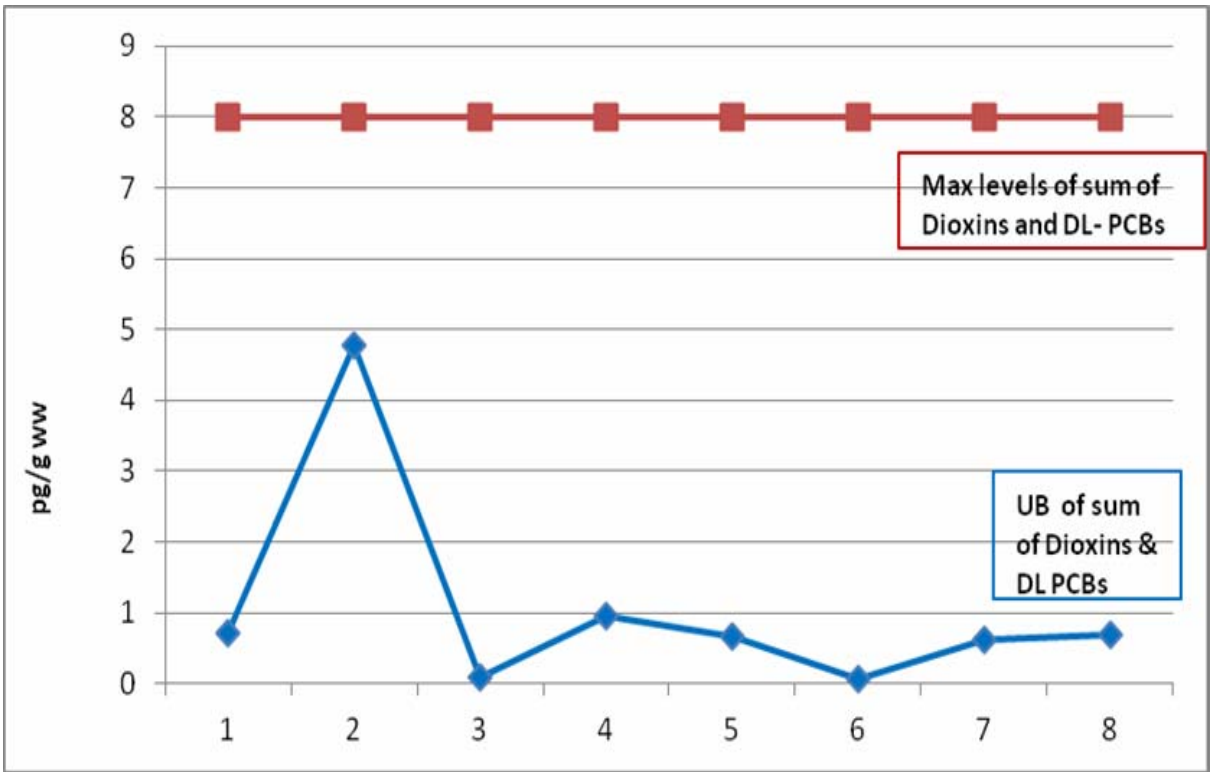
- Program, of monitoring of samples of animal origin as defined by the veterinary services with the implementation of analysis of fresh milk. The milk is analysed for the above POPs and PCBs as well as for other pesticide products. Twenty samples of fresh milk were analysed totally during 2005 – 2006 and only two were found positive as regards ppDDE in concentration lower than 0,002 mg/kg which the limit for quantitative determination. Program Medpol for the examination of Mediterranean pollution in collaboration with the Department of Fisheries and Marine Research. In this program, samples of the fish Mullus Barbatus are analysed. The fish samples are analsyed for the above POPs and PCBs as well as for the Arochlors 1254 και 1260. The samples are usually positive for ppDDE in concentrations lower than 100 ng/g. The PCBs concentrations found range between the detection limit and the limit of quantitative determination.

The results for 2011 are shown in the following Figures 2 and 3.



UB: Dioxin summation level including the detection limit

Figure 2: Results of samples of animal origin examined in 2011 for dioxins and similar to dioxins PCBs



UB: Dioxin summation level including the detection limit

Figure 3: Results of fish samples examined in 2011 for dioxins and similar to dioxins PCBs

ANNEX II

TABLE A: Transformers which may contain PCBs

Holder of the transformer	Manufacturer	Number	Possible concentration PCBs (ppm)
Cyprus Telecommunication Authority	OCREV	52310	605
Carlsberg Breweries	ELETRATOR		439
Cyprus Broadcasting Corporation	OCREV	60750	54
Cyprus Broadcasting Corporation	OCREV	60749	51
Cyprus Cement Co Ltd	TRAFO UNION	K219846	248
Cyprus Cement Co Ltd	TRAFO UNION	K219848	217
Cyprus Cement Co Ltd	CEM-CIEELECTRO-MECANIQUE	FH25785	89
Cyprus Cement Co Ltd	CEM-CIEELECTRO-MECANIQUE	FH25786	81
Cyprus Petroleum Refinery Ltd	BRUSH	76660	58
Cyprus Port Authority	WODEN	107462/2	114
Cyprus State Fair Authority	BONAR&LONG LTD	02/74/3262	96
Cyprus Telecommunication Authority	OCREV	52308	378
Cyprus Telecommunication Authority	MACE	8112	74
Cyprus Telecommunication Authority	MACE	8109	70
Cyprus Telecommunication Authority	MACE	8106	61
Cyprus Telecommunication Authority	MACE	8104	57
Cyprus Telecommunication Authority	MACE	81108	52
Cyprus Telecommunication Authority	MACE	8102	50
Hellenic Chemical Industries	ELTA	173583	103
Hellenic Chemical Industries	(-----) U.S.S.R.	220052	80
Hellenic Copper Mines Ltd	G.E.C.	266206	129
Hellenic Copper Mines Ltd	G.E.C.*	266208	97
Hellenic Copper Mines Ltd	STATTER & CO.	53/2696/B	92
Hellenic Copper Mines Ltd	PARSONS	88549	62
Hellenic Mining Co Ltd	G.E.C.	266207	100
Larnaca Airport	BONAR LONG	02/74/3276	83
Larnaca Airport	WODEN BILSTON	H121269/1	58
Paralimni Hospital	MEDICOR	065-26	126
Vasiliko Cement Works Ltd	SIEMENS	T305266	285
Vasiliko Cement Works Ltd	SIEMENS	484352	120
Vasiliko Cement Works Ltd	HELMKE	772820	104
Vasiliko Cement Works Ltd	TRAFO UNION	403090	101
Vasiliko Cement Works Ltd	HELMKE	-------	73
Vasiliko Cement Works Ltd	GEC ENGLAND	999408	73
Vasiliko Cement Works Ltd	BRUSH	54213/2	64
Vasiliko Cement Works Ltd	SIEMENS	-------	58
Vasiliko Cement Works Ltd	SIEMENS	TM228509	58
Vasiliko Cement Works Ltd	SIEMENS	TM228511	51

TABLE B: Capacitors which may contain PCBs

Onwer	Manufacturer	Number
British East Mediterranean Relay Station	BICC	X6731/54
British East Mediterranean Relay Station	BICC	X6731/56
British East Mediterranean Relay Station	BICC	CX8004 A/11
British East Mediterranean Relay Station	BICC	X6731/24
British East Mediterranean Relay Station	BICC	X6731/29
British East Mediterranean Relay Station	BICC	X6731/22
British East Mediterranean Relay Station	BICC	X6731/33
British East Mediterranean Relay Station	BICC	X6731/56
British East Mediterranean Relay Station	BICC	CX8004 A/1
CARLSBERG Breweries Cyprus	JOHNSON & PHILLIPS LTD	A5788/A3
CARLSBERG Breweries Cyprus	JOHNSON & PHILLIPS LTD	A5788/A4
CARLSBERG Breweries Cyprus	JOHNSON & PHILLIPS LTD	A5788/A1
CARLSBERG Breweries Cyprus	JOHNSON & PHILLIPS LTD	A12331/A1//01
CARLSBERG Breweries Cyprus	JOHNSON & PHILLPS LTD	A5788/A2
Water Development Department	ELIN UNION	1640429
Vasiliko Cement Works Ltd	ASEA	236-46
Vasiliko Cement Works Ltd	HUNTS	Z2/6113/C4
Vasiliko Cement Works Ltd	HUNTS	Z2/6113/C5
Vasiliko Cement Works Ltd	HUNTS	Z2/6113A2
Vasiliko Cement Works Ltd	HUNTS	Z2/6113/A1
Vasiliko Cement Works Ltd	SIEMENS	D653614/24
Vasiliko Cement Works Ltd	SIEMENS	D653613/27
Vasiliko Cement Works Ltd	SIEMENS	70641461/1
Vasiliko Cement Works Ltd	SIEMENS	E193685
Vasiliko Cement Works Ltd	SIEMENS	E254567
Vasiliko Cement Works Ltd	SIEMENS	
Vasiliko Cement Works Ltd	SIEMENS	E254564
Vasiliko Cement Works Ltd	SIEMENS	544358

ANNEX III

List of abbreviations

a-HCH	Alpha Hexachlorocyclohexane
BAT	Best Available Techniques
b-HCH	Beta Hexachlorocyclohexane
CIWT	Complete Installations of Waste Treatment
CORINAIR	Core Inventory Air Emissions
DA	Department of Agriculture
DDT	1,1,1-trichloro-2,2-dis(4-chlorophenyl)ethane
DE	Department of Environment
DFMR	Department of Fisheries and Marine Research
DLI	Department of Labour Inspection
dm	deca meters (10-1 m)
EIONET	European Environment Information and Observation Network
EMEP	European Monitoring and Evaluation Program
EMU	Economic and Monetary Union
EPRTR	European Pollutant Release and Transfer Register
FD	Forest Department
GDP	Gross Domestic Product
GSD	Geological Survey Department
HBCD	Hexabromocyclododecane
HCB	Hexachlorobenzene
IFCS	Intergovernmental Forum of Chemical Substances
IMPEL	European Union Network for the Implementation and Enforcement of Environmental Law
MLWSI	Ministry of Labour, Welfare and Social Insutance
MRL	Maximum Residues Level
NIP	National Implementation Plan
OCL	organochlorinated products
opDDD	op dichlorodiphenyldichloroethane
opDDE	op dichloro-diphenyle-ethene
PBB	polybrominated diphenyls

PBDE	polybrominated diphenyl ethers
PCB	polychlorinated diphenyls
PCDF	polychlorinated dibenzo furans
PCDD	polychlorinated dibenzo-p-dioxins
PCT	polychlorinated triphenyls
PHS	Public Health Services
PIC	Prior Informed Consent
POP	Persistent Organic Pollutants, Έμμονοι Οργανικοί Ρύποι
ppDDD	pp dichlorodiphenyldichloroethane
ppDDE	pp dichloro-diphenyle-ethene
ppm	parts per million
REACH	Registration Evaluation Authorisation and Restriction of Chemicals
SAICM	Strategic Approach to International Chemicals Management
SGL	State General Laboratory
SMP	Strategic Management Plan
STW	Station for the Transhipment of Waste
TEQ	Toxic Equivalents
ULS	Uncontrolled Landfill Site
UNEP	United Nations Environment Program
VAT	Value added tax
WHO	World Hwealth Organisation
WWD	Water Development Department
2,3,7,8-Cl4DD	2,3,7,8 tetrachlorodibenzo-p-dioxin