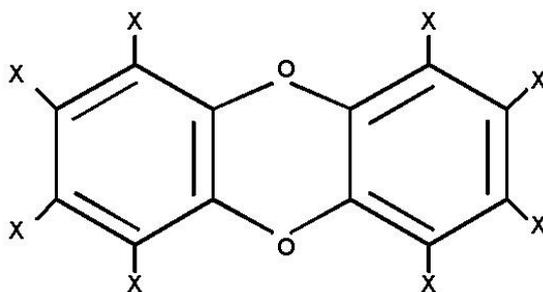




## NATIONAL IMPLEMENTATION PLAN OF STOCKHOLM CONVENTION FOR PERSISTENT ORGANIC POLLUTANTS



**MINISTRY OF LABOUR, WELFARE AND SOCIAL INSURANCE**

**DEPARTMENT OF LABOUR INSPECTION**

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## Summary

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The Stockholm Convention of 2001 aims to protect human health and the environment from the Persistent Organic Pollutants, POP, 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 of 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 POP 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.

At its sixth meeting held from 28 April to 10 May 2013, Annex A has been amended to list Hexabromocyclododecane in Annex A with specific exemptions.

At its seventh meeting held from 4 to 15 May 2015, Annexes A and C have been amended to list Hexachlorobutadiene in Annex A without specific exemptions, Pentachlorophenol and its salts and esters in Annex A with specific exemptions and Polychlorinated naphthalenes in Annex A with specific exemptions and in Annex C.

At its eighth meeting held from 24 April to 5 May 2017, Annexes A and C have been amended to list Decabromodiphenyl ether (commercial mixture, c-DecaBDE) in Annex A with specific exemptions, Short-chain chlorinated paraffins in Annex A with specific exemptions and Hexachlorobutadiene in Annex C.

At its ninth meeting held from 29 April to 10 May 2019, it was agreed to list dicofol and Perfluorooctanoic acid (PFOA), its salts and PFOA related compounds in Annex A to the Convention and to amend the listing in Annex B to the Convention of perfluorooctane sulfonic acid (PFOS) its salts and perfluorooctane sulfonyl fluoride (PFOSF).

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 POP included in Annex C of the Convention and produced unintentionally from human sources, are dioxins and furans, hexachlorobenzene 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 preparation of the emission inventory of dioxins in the ten new Member States of European Union
- (b) the training of representatives of these ten countries for the preparation of the emission inventory of dioxins with the use of emission factors
- (c) to carry out 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 recalculations carried out based on the EMEP/EEA Emission Inventory Guidebook 2016. From the inventory of 2017 it was shown that the major percentage of dioxin emissions was caused by the uncontrolled burning of waste (agricultural and domestic) and the combustion in the energy sector. Based on the implementation of the relevant legislation (such as the prohibition of burning of agricultural waste) and the construction of landfill sites, the uncontrolled burning of waste was and the emissions of POP were expected to be reduced further.

Moreover, the burning of domestic waste and waste of building under construction in inhabited areas is regulated by article 124(1A) of the Municipalities' Law.

The industrial sources in Cyprus responsible for the emissions of POP 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 inventory of hexachlorobenzene and PCBs of Annex C of the Convention was carried out by using emission factors based on the EMEP/EEA Emission Inventory Guidebook 2016. For the HCB, PCB and Dioxins there are not much data regarding the emission factors. For this reason, their uncertainties for the calculations of their emissions is high.

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

## 1. INTRODUCTION

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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 Stockholm Convention on Persistent Organic Pollutants was adopted on 22 May 2001 and entered into force on 17 May 2004 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 182 countries have ratified it. Cyprus ratified the Convention on the 7<sup>th</sup> 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 (pesticide)
  - 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.
- $\alpha$ -hexachlorocyclohexane - pesticide and by-product from the production of other chemicals
- Chlordecone - pesticide
- Hexabromobiphenyl – industrial chemical
- Hexabromobiphenyl ether – industrial chemical
- Heptabromobiphenyl ether – industrial chemical
- Lindane - pesticide
- Pentachlorobenzene - pesticide, industrial chemical and by-product from the production of other chemicals
- Tetrabromodiphenyl ether – industrial chemical
- Pentabromodiphenyl ether - industrial chemical
- Endosulfan and its isomers – insecticides
- Hexabromocyclododecane (HBCD) - flame retardant
- Decabromodiphenyl ether (commercial mixture, c-decaBDE) -

- Hexachlorobutadiene – industrial chemical
- b-hexachlorocyclohexane – pesticide
- Pentachlorophenol and its salts and esters – pesticide
- Polychlorinated naphthalenes – industrial chemical
- Short-chain chlorinated parafines (SCCPs) – industrial chemical

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 that 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 POP 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)
- Hexachlorobutadiene (HCBd) - They are included also in Annex A of the Convention as stated before.
- Polychlorinated naphthalenes - They are included also in Annex A of the Convention as stated before.

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 POP 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 POP 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 POP in the future.

## **1.2. National Implementation Plan (NIP)**

Based on the commitments derived from the ratification of the Convention for POP (Law 42(III)/2004) and specifically the Article 7, every country signed 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 29<sup>th</sup> 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 POP 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 possess to include them in the NIP.
- (c) The information of the public through the DLI's websites:  
[www.mlsi.gov.cy/dli](http://www.mlsi.gov.cy/dli) and [www.airquality.gov.cy](http://www.airquality.gov.cy)
- (d) The preparation of a draft NIP and its dispatch to all relevant organizations for comments.
- (e) The submission of the new NIP to the Secretary of the Convention, in English language.

## **2. BASIC INFORMATION FOR CYPRUS**

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### **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° east, 35° 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 Olympus (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 and a few fountains.

##### **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.**

The population of Cyprus is estimated at 956.800 at the end of 2017 compared to 947.000 at the end of the previous year, recording an increase of 1,0%.

This number does not include the 162,000 settlers who live in the occupied by Turks part of Cyprus. This number includes the 11,400 (1,2%) of Maronites, Armenians and Latins of the Greek-Cypriot community.

## **Languages.**

Greek and Turkish are the official languages of the Republic of Cyprus.

### **2.1.2. Political and financial situation**

#### **Executive Authority**

The Governing system is Presidential. The President of the Republic is elected through elections for five-year period. The Executive Authority is applied from the President and one Council of Ministers of eleven Ministers which is appointed by the President. The Turks have denied taking part in the Government since 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 Turkish-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 of the Legislature and Inspection Service respectively, as well as the Director of the Central Bank, considered as 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 the 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 of 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 of 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**

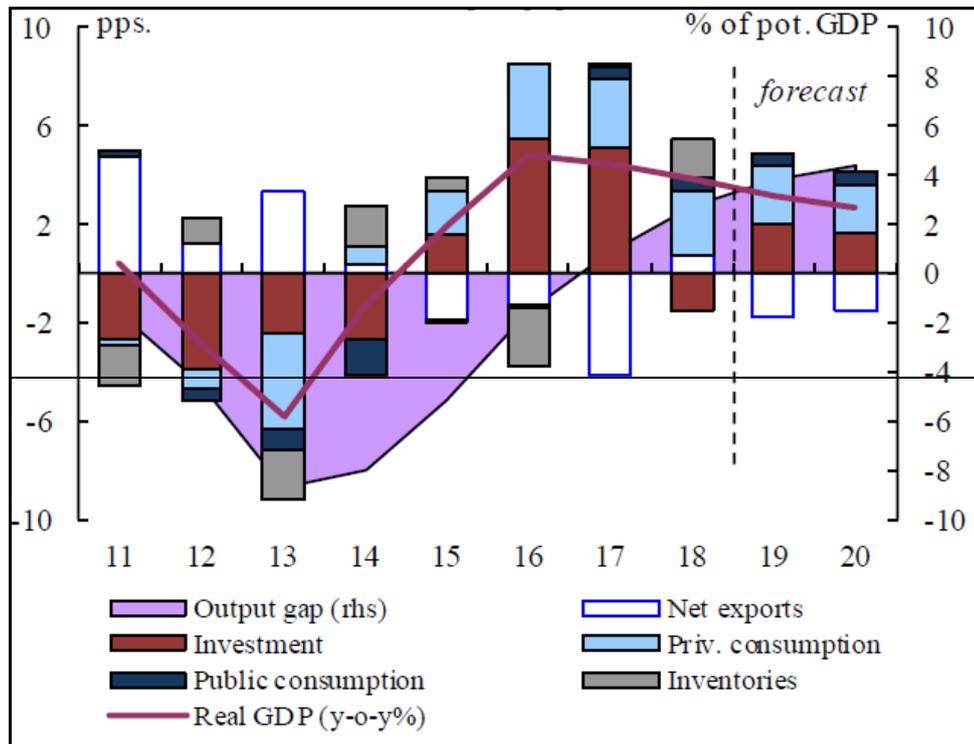
During the last two decades Cyprus economy has changed from agricultural economy to economy of light industry and services. Today, Cyprus is an important tourist destination with developed social infrastructure.

In 29<sup>th</sup> 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.

The Consumer Price Index increased by 1,5% in the period January-March 2019 compared to the corresponding period of 2018. The prices of local products increased on average by 7,7% and services by 1,2%. The prices of petroleum products decreased by 7,1% and imported goods by 0,6%.

In 2018, the inflation was increased with rate 1,4% in comparison to 0,5% in 2017 and -1.4% in 2016.

The following Figure 1 shows Cyprus' Real GDP growth and contributions.



**Figure 1:** Cyprus – Real GDP growth and contributions, output gap (European Commission)

### 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 led 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 municipal 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 notably through the construction of Integrated Waste Management Facilities (IWMF). At the IWMF, a mechanical sorting of mixed municipal solid waste takes place for the recovery of recyclable materials (paper, glass, plastic and metal), whilst the organic fragment is biologically treated for the production of compost and secondary fuel (RDF-SRF), which can be used for energy utilization. Furthermore, all residues and waste materials from various treatment processes at the IWMF are disposed in controlled landfills for residues, within the area of the facilities.

### **Solid waste.**

Specifically, the Ministry of Agriculture, Rural Development and Environment, promotes the following projects, in the framework for the implementation of the Municipal Waste Management Plan (MWMP) in Cyprus, which can contribute positively to the control and management of POP:

#### Integrated Waste Management Facilities (IWMF)

1. Larnaca-Famagusta district.

The construction of the IWMF at Koshi, covering Larnaca and Famagusta (Ammochostos) districts, is in full operation since 1.4.2010. The cost of the contract was approximately €46 million plus VAT and the project was co-funded by the Cohesion Fund of the EU, during the programming period 2004-2006.

2. Limassol district.

The construction of the IWMF at Pentakomo, covering Limassol district, is in full operation since 10.11.2017. The cost of the contract was approximately €43 million plus VAT and the project was co-funded by the Cohesion Fund of the EU, during the programming periods of 2007-2013 and 2014-2020.

#### Sanitary Landfills

3. Pafos district.

The sanitary landfill site at Marathounda for municipal solid waste, covering Pafos district, is in full operation since June 2005. The abovementioned sanitary landfill site was constructed and it operates according to the Directive 99/31/EC for the sanitary landfill of waste. Recently, the Ministry of Agriculture, Rural Development and Environment applied to the Structural Reform Support Service (SRSS) of the European Commission for technical support on the revision of the 2015-2021 Waste Management Strategy and the Municipal Waste Management Plan, which was approved by the Council of Ministers in November 2015. As part of the above review, a feasibility study is included to examine whether it is necessary to upgrade the sanitary landfill site to an IWMF and/or if any other projects/infrastructure is required to be implemented in order to achieve sustainable management of the solid municipal waste in the district.

4. Nicosia district.

Since 1.9.2018, the municipal solid waste of Nicosia district is transferred to Koshi IWMF for treatment and final disposal. As part of the above review from SRSS, a feasibility study is also included to examine whether it is necessary to construct an IWMF covering Nicosia district and/or if any other projects/infrastructure is required to be implemented in order to achieve sustainable management of the solid municipal waste in the district.

### Termination of the Operation and Rehabilitation of Uncontrolled Landfill Sites (ULS)

After the commencement of the operation of the controlled sanitary landfill site for municipal waste at Marathounda (Pafos) and the commencement of the operation of the controlled landfill sites for residues at the Koshi IWMF and the Pentakomo IWMF, the operation of 116 ULS in Cyprus was gradually terminated, including Kotsiatis and Vati, which were the main ULS utilized for the disposal of municipal and other waste of Nicosia and Limassol districts, respectively.

#### 1. Larnaca-Famagusta districts.

The project consisted of three separate contracts. The construction works for the rehabilitation of the 16 ULS, in both districts, were completed and all ULS are under environmental monitoring, according to the Directive 99/31/EC. The costs of the contracts were €6.717.000 plus VAT for Part I, €4.789.000 plus VAT for Part II and €5.982.510 plus VAT for Part III. The project was co-funded by the Cohesion Fund of the EU, during the programming period 2007-2013.

#### 2. Pafos district.

The construction works for the rehabilitation of the 37 ULS in Pafos district, were completed and all ULS are under environmental monitoring, according to the Directive 99/31/EC. The cost of the contract was €6.622.000 plus VAT and the project was co-funded by the Cohesion Fund of the EU, during the programming period 2007-2013.

#### 3. Limassol district.

The implementation of the relevant studies started in September 2017 and the construction works for the rehabilitation of the 43 ULS in Limassol district are estimated to be completed in the second semester of 2022. The budget for the preparation of the relevant studies, the supervision of the rehabilitation works and the execution of the works is estimated to reach €27 million including VAT. The project is co-funded by the Cohesion Fund of the EU, during the programming period 2014-2020.

#### 4. Nicosia district.

The implementation of the relevant studies started in October 2017 and the construction works for the rehabilitation of the 20 ULS in Nicosia district are estimated to be completed in the second semester of 2022. The budget for the preparation of the relevant studies, the supervision of the rehabilitation works and the execution of the rehabilitation works is estimated to reach €27 million including VAT. The project is co-funded by the Cohesion Fund of the EU, during the programming period 2014-2020.

### **Liquid waste.**

The main pursuit in the sector of liquid waste comprised the gradual harmonization, until 31<sup>st</sup> of December 2027, with the EU Directive 91/271/EC for the civic waste, which refer to the installation of central sewerage systems for the collection and treatment of wastewater in all settlements, which have population of more than 2000 people and 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 promoted 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.

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

- 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 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 **Department of Labour Inspection (DLI)** of the Ministry of Labour, Welfare and Social Insurance (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 1021/2019 for POP, the European Regulation 1907/2006 (REACH), the European Regulation 648/2012 for the import and export of dangerous chemical substances and the ratifying Laws of Rotterdam Convention (PIC Convention) concerning the export and import of hazardous chemicals, the Stockholm Convention for POP, the Protocol of Geneva Convention of 1979 for the transboundary Pollution of the Atmosphere caused by the POP and the Convention of Large Scale Accidents.
- The **Department of Environment (DE)** of the Ministry of Agriculture, Rural Development and Environment coordinates the programs for the environment. It has the responsibility for the environmental impact assessments, the laws for the pollution control of water and ground, the waste management, the protection of nature and climate change. 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 Aarhus Convention for the public access to information relevant to the environment etc.
- The **Department of Agriculture (DA)** of the Ministry of Agriculture, Rural Development 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 pesticides, the control of the residues in the fodders (MRLs), as well as the legislation of fertilisers (producing, mixing, packaging, labelling, composition and marketing) is also a responsibility of DA.

- The **Geological Survey Department (GSD)** of the Ministry of Agriculture, Rural Development 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, Rural Development 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 **Department of Forests (D.F.)** of the Ministry of Agriculture, Rural Development and Environment is responsible for the implementation of the forest policy and legislation, including prevention and suppression of the forest fires as well as the protection and management of state forests.  
Clauses of the Forest Legislation prohibit the set up of fire or abandonment of fire or the throw-off of lit match or cigarette end 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 the chemical analysis of food, water, treated domestic waste, environmental samples (air, soil, sea water and sea sediments) and consumer goods such as medication, cosmetics, children toys etc. The main purpose of the specialized labs of the SGL is the monitoring and applied research in several sectors, including the examination of existence of various pollutants such as the POP in water, food, air and treated domestic wastes.
- 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.

### 2.2.3. International commitments and responsibilities.

#### POP Protocol

Cyprus Government, after the decision of the Councils of Ministers dated 11<sup>th</sup> June 1991, accessed in the Geneva Convention of 1979 for the Long Range Transboundary Air Pollution. Under the framework of the Convention 8 protocols have been issued. One of them, the Protocol of Geneva Convention 1979 for the Long Range Transboundary Air Pollution caused by POP (Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants (POP)), was signed in Aarhus of Denmark in the 24<sup>th</sup> 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 POP and the reduction of their annual emission.

## **EU Regulation 1021/2019**

On 20 June 2019 Regulation (EU) 1021/2019 of the European Parliament and of the Council of 20 June 2019 on Persistent Organic Pollutants was published replacing the previous Regulation 850/2004 on POP.

The main responsibilities of the Member States of the EU derived from Regulation 1021/2019 are the following:

- a) Complete prohibition of the production and use of the chemical substances and mixtures of Annex I of the Regulation,
- b) Preparation of an inventory of POP 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, Rural Development and Environment. The Minister of Labour, Welfare and Social Insurance has been designated as coordinator and focal point for Cyprus.

## **PIC Convention**

Cyprus has signed the PIC Convention (Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade) on the 11<sup>th</sup> of September 1998 and accessed in it on the 17<sup>th</sup> of December 2004. The Convention entered into force on 17<sup>th</sup> of March 2005. The corresponding EU legal text is Regulation 649/2012.

The PIC Convention introduces limitations to the import and export of some dangerous chemical substances and pesticide products creating a mechanism of exchange of information in the cases where there is import or export of one of these products. The chemicals listed in Annex III include pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons by two or more Parties and which the Conference of the Parties has decided to subject to the PIC procedure. There are a total of 50 chemicals listed in Annex III, 34 pesticides (including 3 severely hazardous pesticide formulations), 15 industrial chemicals, and 1 chemical in both the pesticide and the industrial chemical categories.

Specifically, the main provisions of the above Convention are the following:

- A list of chemical substances which are considered very dangerous for human health or the environment are subject to the Prior Informed Consent Procedure.
- A procedure is established regarding the mechanism of exchange of information of the relevant countries where import or export of a substance covered by the Convention is taking place.
- A procedure is established for the introduction of additional chemical substances in this list.
- A notification procedure for the export of a chemical substance which is banned or which is under austere limitations in the territory of a country Party to the Convention.
- The information which accompany the exported chemical substances and the procedure for the exchange of these information between the relevant countries.

- The requirements for the implementation of the Convention's provisions and the procedures followed in the case of non-compliance.
- The procedures for the operation of the Conference of the Parties, the procedure for the settlement of disputes between the Parties of the Convention and the procedure for the amendment of the Convention's text.

Competent Authority for the implementation of the provisions of the PIC Convention is the Minister of Labour, Welfare 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, Rural Development 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, Rural Development 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 on Industrial Emissions 2010/75/EC
- 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) ECHA – European Chemicals Agency
- i) International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests

#### **2.2.4. Existing legislation related to POP.**

POP substances are controlled in Cyprus directly or indirectly through the following legislation:

##### **National legislation on International issues:**

- The ratifying 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 Long Range Transboundary Air Pollution caused by POP (Ratified) Law 2004.

- The Stockholm Convention on Persistent Organic Pollutants Ratifying Law of 2004 as amended.
- The Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade Ratifying Law of 2004 as amended.

### **European legislation.**

- Regulation 1021/2019 for POP, that aims to protect human health and the environment from those pollutants.
- Regulation 649/2012 concerning the export and import of hazardous chemicals.
- Regulation 1907/2006 for the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH Regulation).
- European Regulation 1272/2008 on the Classification, Labeling and Packaging of dangerous chemicals and mixtures (CLP Regulation).
- 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.
- Directive 2013/39/EU amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy.

### **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 Plant Protection Products 2011
- Regulations 615/2003 for the Pesticides (Selling, Producing and Storing) Regulations of 2003

- Law 34(I)/2014 for the Biocides 2014

#### PCBs

- 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.

- The Control of Atmospheric Pollution Law of 2002 (Law 187(I)/2002)
- The Control of Atmospheric Pollution (Amendment) Law of 2007 (Law 85(I)/2007)
- The Control of Atmospheric Pollution (Amendment) Law of 2008 (Law 10(I)/2008)
- The Control of Atmospheric Pollution (Amendment) Law of 2009 (Law 79(I)/2009)
- The Control of Atmospheric Pollution (Amendment) Law of 2013 (Law 51(I)/2013)
- The Control of Atmospheric Pollution (Amendment) (No. 2) Law of 2013 (Law 180(I)/2013)
- The Control of Atmospheric Pollution (Amendment) Law of 2018 (Law 114(I)/2018)
- The Control of Atmospheric Pollution (Amendment of the Annex II of the Law) Order of 2014 (R.A.A. 524/2014)
- The Control of Atmospheric Pollution (Amendment of the Annex II of the Law) Order of 2018 (R.A.A. 254/2018)
- The Control of Atmospheric Pollution (Prevention and Reduction of Atmospheric Pollution by Asbestos) Regulations of 2002 (R.A.A. 528/2002)
- The Control of Atmospheric Pollution (Prevention and Reduction of Atmospheric Pollution by Asbestos) Notification of 2004 (R.A.A. 186/2004)
- The Control of Atmospheric Pollution (Control of Volatile Organic Compounds Emissions Resulting from the Storage of Petrol and its Distribution from Terminals to Service Stations) Regulations of 2003 (R.A.A. 76/2003)
- The Control of Atmospheric Pollution (Control of Volatile Organic Compounds Emissions Resulting from the Storage of Petrol and its Distribution from Terminals to Service Stations) Notification of 2004 (R.A.A. 181/2004)
- The Control of Atmospheric Pollution (Stage II Petrol Vapour Recovery During Refueling of Motor Vehicles at Service Stations) Regulations of 2012 (R.A.A. 150/2012)
- The Control of Atmospheric Pollution (Stage II Petrol Vapour Recovery During Refueling of Motor Vehicles at Service Stations) (Amendment) Regulations of 2016 (R.A.A. 47/2016)
- The Delegation of Authority Arising from any Law and Control of Atmospheric Pollution (Delegation of Authority) Notification of 2017 (I.A.A. 179/2017)
- The Control of Atmospheric Pollution (Non Licensable Installations) Regulations of 2004 (R.A.A. 170/2004)
- The Control of Atmospheric Pollution (Non Licensable Installations) (Amendment) Regulations of 2008 (R.A.A. 198/2008)
- The Control of Atmospheric Pollution (Non Licensable Installations) (Amendment) Regulations of 2013 (R.A.A. 219/2013)
- The Control of Atmospheric Pollution (Non Licensable Installations) (Amendment) Regulations of 2015 (R.A.A. 184/2015)

- The Control of Atmospheric Pollution (Non Licensable Installations) (Amendment) Regulations of 2018 (R.A.A. 228/2018)
- The Control of Atmospheric Pollution (Non Licensable Installations) Order of 2008 (R.A.A. 488/2008)
- The Control of Atmospheric Pollution (Limitation of Emissions of Certain Pollutants into the Air from Medium Combustion Plants) Regulations of 2018 (R.A.A. 227/2018)
- The Air Pollution Control (General Operating Conditions for Petroleum Storage Installations) Order of 2018 (R.A.A. 2/2019)
- The Air Pollution Control (General Operating Conditions for Diesel Storage Installations) Order of 2018 (R.A.A. 3/2019)
- The Air Pollution Control (General Operating Conditions for Petrol Stations) Order of 2018 (R.A.A. 4/2019)
- The Industrial Emissions (Integrated Pollution Prevention and Control) Law of 2013 (Law 184(I)/2013)
- The Industrial Emissions (Integrated Pollution Prevention and Control) (Amendment) Law of 2016 (Law 131(I)/2016)
- The Industrial Emissions (Emission Permit Application Form) Order of 2014 (R.A.A. 215/2014)
- The Industrial Emissions (Emission Permit Application Form – Use of Organic Solvents) Order of 2014 (R.A.A. 250/2014)
- The Industrial Emissions (General Operating Conditions for Dry Cleaning) Order of 2014 (R.A.A. 511/2014)
- The Industrial Emissions (Prescribed Fees) Order of 2014 (R.A.A. 545/2014)
- The Integrated Pollution Prevention and Control Notification of 2013 (R.A.A. 434/2013)
- The Industrial Emissions (Prescribed Fees for examining the application and for issuing the Industrial Emission Permit) Order of 2016 (R.A.A. 197/2016)
- The Industrial Emissions (Prescribed Fees) Order of 2018 (R.A.A.342/2018)
- The Industrial Emissions (Prescription of requirements concerning the methods and procedures to be applied during sampling, analysis and measurements) Order of 2019 (R.A.A. 35/2019)

#### Air Quality

- The Air Quality Law of 2010 (Law 77(I)/2010)
- The Air Quality (Amendment) Law of 2017 (Law 3(I)/2017)
- The Air Quality (Annual Emission Ceilings for Certain Atmospheric Pollutants) Regulations of 2004 (R.A.A. 193/2004)
- The Air Quality (Annual Emission Ceilings for Certain Atmospheric Pollutants) (Amendment) Regulations of 2012 (R.A.A. 25/2012)
- The Air Quality (Annual Emission Ceilings for Certain Atmospheric Pollutants) (Amendment) Regulations of 2017 (R.A.A. 212/2017)
- The Air Quality (Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air) Regulations of 2007 (R.A.A. 111/2007)
- The Air Quality (Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air) (Amendment) Regulations of 2017 (R.A.A. 38/2017)
- The Air Quality (Limit Values for Sulphur Dioxide, Nitrogen Dioxide and Oxides, Particulates, Lead, Carbon Monoxide, Benzene and Ozone in Ambient Air) Regulations of 2010 (R.A.A. 327/2010)

- The Air Quality (Limit Values for Sulphur Dioxide, Nitrogen Dioxide and Oxides, Particulates, Lead, Carbon Monoxide, Benzene and Ozone in Ambient Air) (Amendment) Regulations of 2017 (R.A.A. 37/2017)

#### 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

#### Fodders

- 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. Handling of POP in Cyprus.**

### **2.3.1. Pesticide products (including DDT).**

The Department of Agriculture of the Ministry of Agriculture, Rural Development 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 plant protection products and biocides included in Annexes A and B of the Convention whose 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 Excises Department for the control of chemical substances imported in Cyprus.

**Table 1:** Plant protection products and biocides

<b>Chemical substance name</b>	<b>CAS number</b>	<b>Date of prohibition</b>
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
Alpha hexachlorocyclohexane	319-84-6	The use as a pesticide product has never been granted
Beta hexachlorocyclohexane	319-85-7	The use as a pesticide product has never been granted
Chlordecone	143-50-0	The use as a pesticide product has never been granted
Lindane	58-89-9	The use as a pesticide product has never been granted
Pentachlorobenzene	608-93-5	The use as a pesticide product has never been granted
Technical Endosulfan and its related isomers	115-29-7	2.6.2006

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

The PCBs are a threat to 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 since the beginning of the decade of the 1970s.

It is generally recognized that PCBs which remain in existing equipment continue to be a threat for the environment. In this respect, Directive 96/59/EC regarding the disposal of PCBs places conditions for the preparation of lists for the labelling 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:

- the responsibility for the appropriate disposal, until 2010, of all the devices which include PCBs with volume greater than 5 dm<sup>3</sup> (article 3 of the Directive)
- the continuation of the use of these devices whose liquids is considered to contain PCBs between 0,05% (500 ppm) and 0,005% (50 ppm), until the end of their lives. Equipment, which contains concentration greater than 50 ppm of PCBs has to be included in a list and be labeled (article 4(2) and 9(2) of the Directive).
- the replacement of the liquid is allowed with the condition that this liquid contains less than 0,05% and preferable less than 0,005% of PCBs, while the topping up of such fluid 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. For the import of transformers, a chemical analysis certificate is required by an approved laboratory, ensuring that the oil of the transformers is free from PCBs.

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 provisions are (i) the creation of a technical folder by the manufacturer within the framework of the Law on CE marking and (ii) the supervision of the market based on the European Regulation (EC) No. 765/2008 regarding the determination of the accreditation requirements and the supervision of the market regarding the trade of the products. Articles that contain or may contain brominated diphenyl ethers are not allowed to enter Cyprus. In the case that articles found to contain or may contain brominated diphenyl ethers, are exported back to the country of origin.

The disposal and management of the waste is regulated by the Water and Soil Pollution Control Law 106(I)/2002 and the Waste Laws of 2011 to 2018.

Based on Regulation 9(1) of the Regulations P.I. 636/2002 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 Gazette of the Republic on 8.12.2006 (Regulation 456/2006). In this Plan, there are actions taken by the 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 environmental sound management of PCBs, the list for the owners of transformers

having PCBs and their responsibilities relevant to the legislation. Cyprus is at the final stage of updating the National Implementation Plan. All the holders/owners of equipment (transformers and capacitors) containing PCBs (50 ppm - 500ppm) have been notified for their obligations as those originated by the 2 above mentioned Regulations. The Regulations for the waste (Restriction of the use of certain dangerous substances in electric and electronic equipment) of 2014 (P.I. 203/2014) determine rules 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 such waste with environmentally correct way.

### 2.3.3. Emissions from unintentional production.

#### Dioxins/Furans

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

The toxicity of these chemical compounds differs between each congener and depends on the number and location of Chlorine atoms they contain. The most toxic type of dioxin is the 2,3,7,8-tetrachlorodibenzo-p-dioxine (2,3,7,8-Cl<sub>4</sub>DD, which has toxicity coefficient 1. This dioxin, as well as the remaining most toxic types of dioxins and their corresponding toxicity coefficients is shown in Table 2.

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<sub>4</sub>DD.

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 mainly 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 carried out. 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	

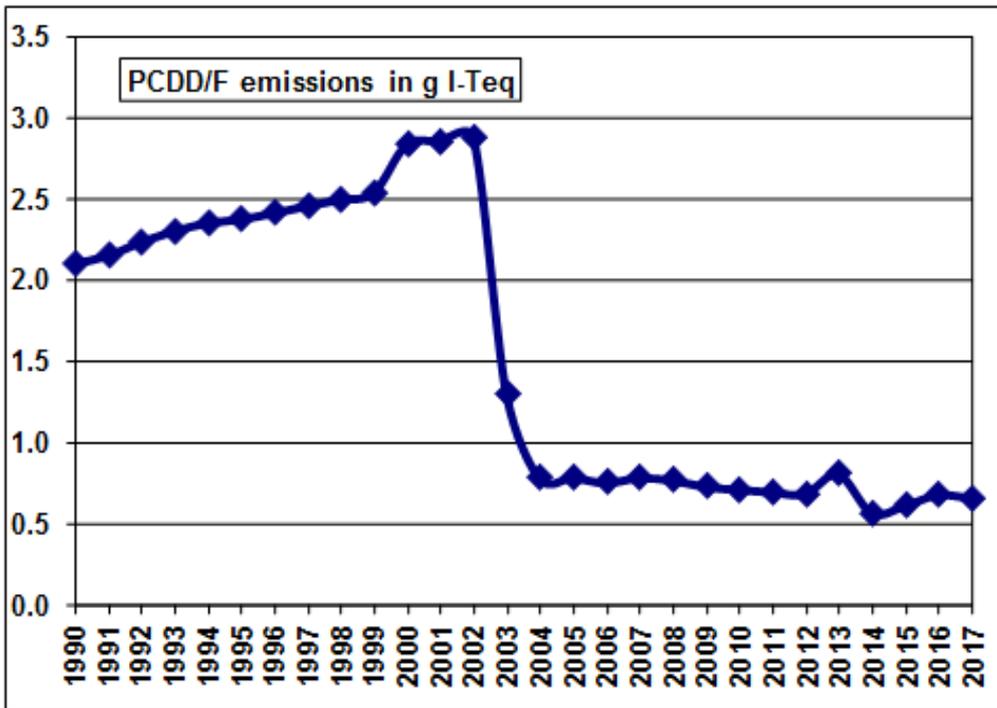
2,3,7,8-TCDD	1	<i>Non-ortho</i> PCBs	
1,2,3,7,8-PeCDD	1	PCB 77	0.0001
1,2,3,4,7,8-HxCDD	0.1	PCB 81	0.0003
1,2,3,7,8,9-HxCDD	0.1	PCB 126	0.1
1,2,3,6,7,8-HxCDD	0.1	PCB 169	0.03
1,2,3,4,6,7,8-HpCDD	0.01		
OCDD	0,0003		
Dibenzo-furans ('PCDFs")		<i>Mono-ortho</i> PCBs	
2,3,7,8-TCDF	0.1	PCB 105	0.00003
1,2,3,7,8-PeCDF	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 the above 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.

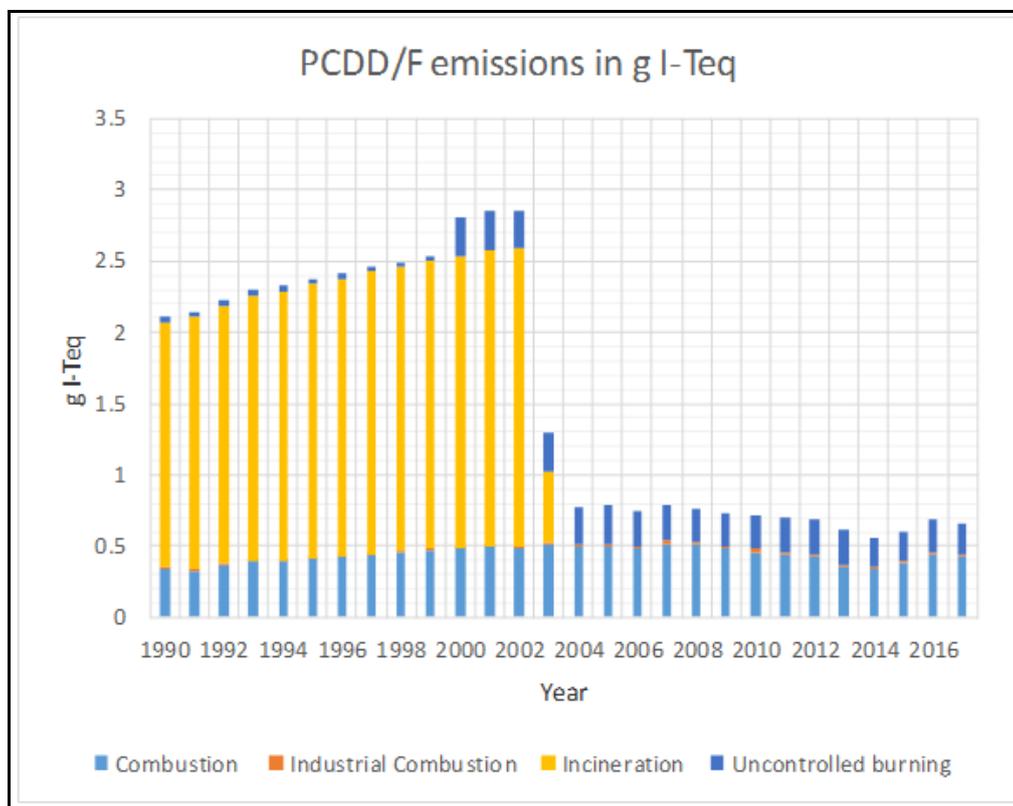
As a result of this study the first dioxin inventory for emissions to the atmosphere was prepared for the year 2002, which was subsequently extended for all years since 1990. For the calculation of the emissions the activity data for industrial sources (production and fuels) were used. An estimation 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 2017, 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 - 2017

In Figure 3, the atmospheric emissions of dioxins by category are presented. In this figure the dioxin emissions to atmosphere from four major sources are presented. These sources are the burning of fuels (for energy production and by cars), the industrial sources, the open burning and the incineration.



**Figure 3:** Dioxin emissions in the atmosphere by category in the period 1990 - 2017

As shown in Figure 3, after 2003, a proportion of dioxins emitted in the air is from uncontrolled open burnings and includes:

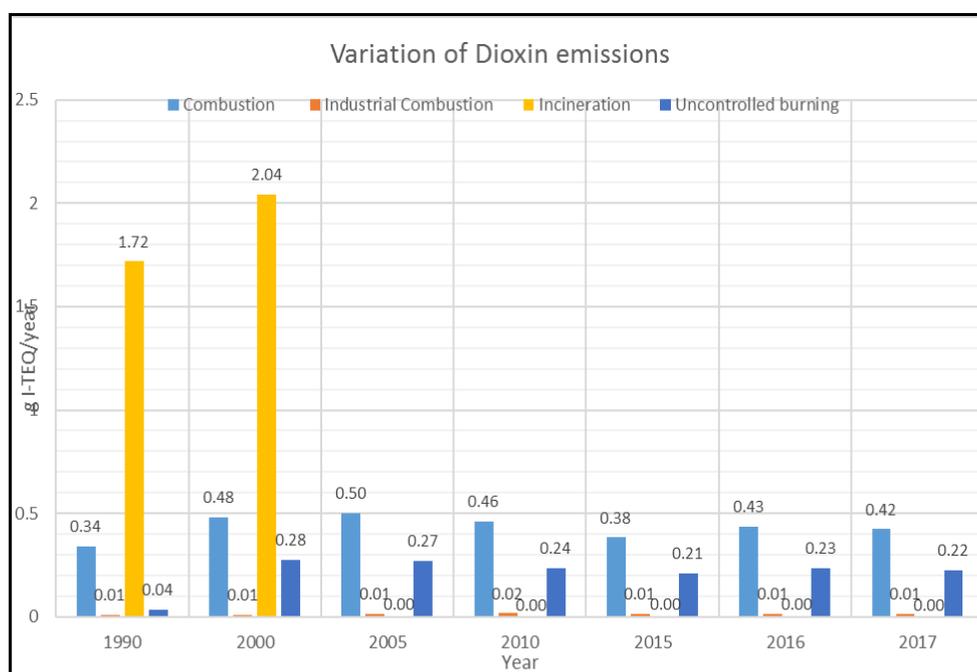
- (a) burning of municipal waste in open landfills
- (b) burning of garden waste and wastes from construction sites in inhabited areas
- (c) burning of agricultural waste (wheat stalk residues, trimming of trees, plastic film used in greenhouses and animal carcasses)
- (d) bonfires
- (e) accidental fires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

The percentage of dioxins emitted in the atmosphere from uncontrolled fires reaches approximately the 30% of the total POP emissions for the years 2004 to 2017. Following the implementation of several measures (which are outlined in paragraph 3.3.3), this percentage has been reduced significantly.

The emissions from industrial sources 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 is sterilised and then it is landfilled.

Another significant reduction in dioxin emissions is caused due to the process of incineration 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 termination of incineration of clinical waste.



**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 hexachlorobenzene and PCBs are:

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

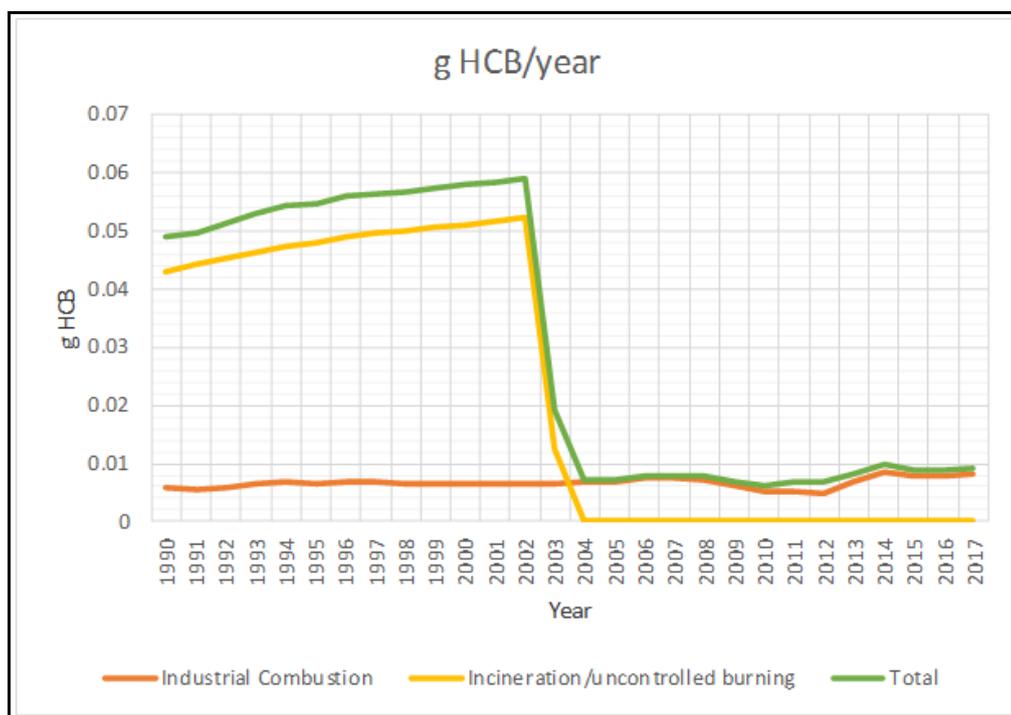
Other possible emission sources which are included in the Convention are:

- (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

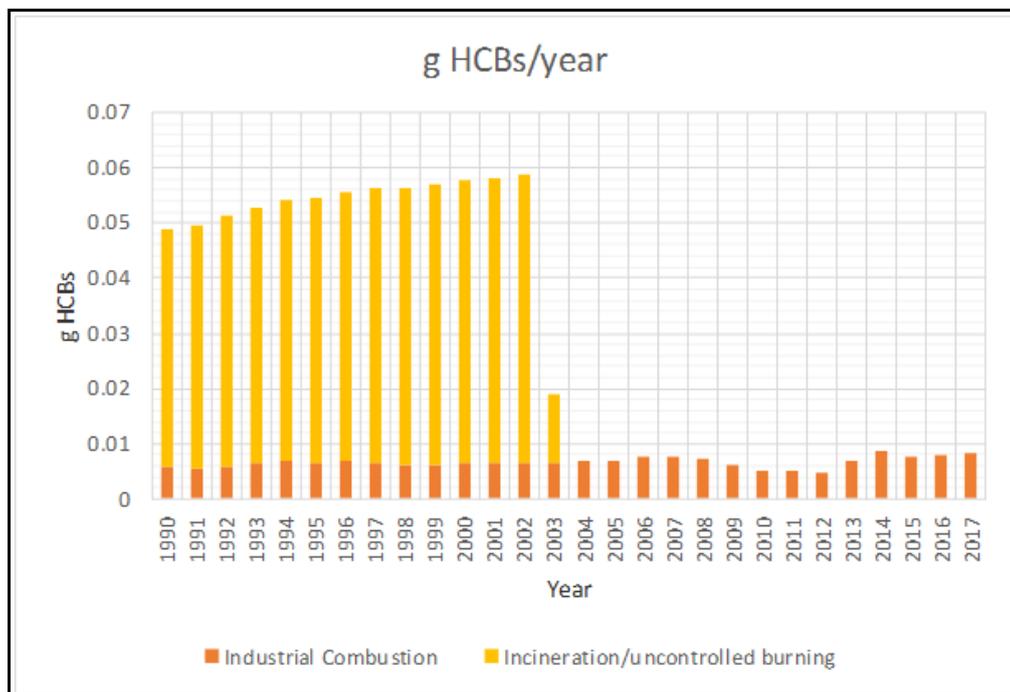
According to the data of the industrial sources regarding the produced products (activity data) as well as the fuels used and the use of emission factors, the emissions of hexachlorobenzene and PCBs in Cyprus were calculated for the years 1990 to 2017. The emission factors were derived from the CORINAIR Guidebook of the European Program of the Control and the Evaluation of Transboundary Pollutants (EMEP/CORINAIR Emission Inventory Guidebook 2016).

The emission inventory of hexachlorobenzene of Annex C of the Convention was carried out by using emission factors based on the EMEP/EEA Emission Inventory Guidebook 2016. For the HCB, there are not much data regarding the emission factors. For this reason, the uncertainties for the calculations of their emissions is high.

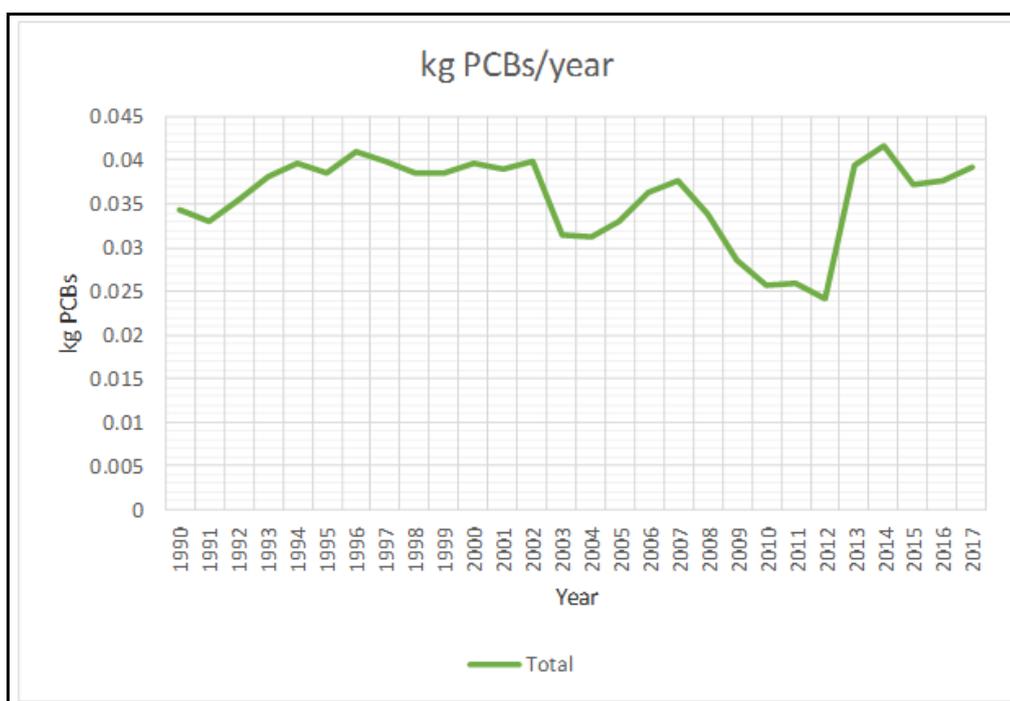
The emissions of hexachlorobenzene are shown in Figures 5 and 6. PCBs emissions are shown in Figure 7. As it is presented in these figures, the emissions of these pollutants are being reduced since 2004. The main reason is the termination of the open burning of animal carcasses.



**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 POP of Annexes A and B, since either these were 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, Rural Development 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, Rural Development 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 State General 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, Rural Development 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.

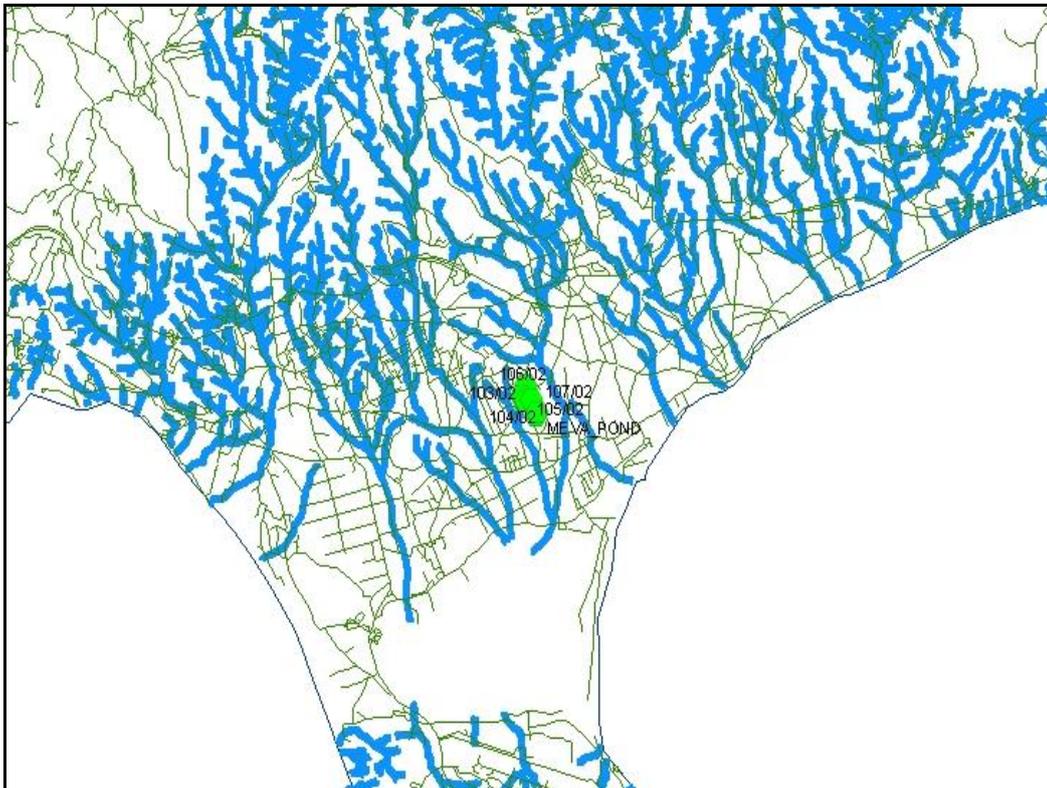
The results of this study were presented to the relevant Ministers' Committee. In 2010, after guidance of this Committee, the DE reexamined the production of dangerous waste in Cyprus as well as the need for their management from the Government. The relevant report, which was presented in a meeting of the Ministers' Committee in June 2011 from the DE, concerned the need of construction of a 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 construction 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.

From 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 it is the coordinator. This Committee includes also the State General 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, as well as 5 surface soil 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 buried. 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 takes actions according to the event.

The local Authorities (Polemia 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 POP.**

The monitoring of POP from industrial sources and especially the monitoring of dioxins is accomplished through the implementation of the Control of Atmospheric Pollution Law 2002 (2) to 2018 and the Industrial Emissions Law (Integrated Pollution Prevention and Control) 2016 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<sup>3</sup>.

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 POP 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 Laboratory, implement annual programs for the monitoring and control of PCBs and organochlorinated pesticides (OCs), dioxins and furans in the food and surface water.

The Law for the control of the above substances in food (Regulations 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 POP, such as dioxins, PCBs, OCs 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 OCs has been carried out 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 & 2013 - 2018) a reduced trend in PCBs and OCs was found (Annex I, Figures 1 & 2).

Moreover, since 1983, the State General Laboratory has started the inspection and monitoring of some POP included in Annex A, B and C of Stockholm Convention in food products. The inspection was extended gradually to cover the requirements of the existing food Law (Regulations 1881/2006/EC and 396/2005/EC). As an example, in Annex I, the Figures 3 and 4 show the characteristic levels of the sum of dioxins and dioxin-like PCBs observed in 2018. It should be noted that the levels of dioxins, furans, PCBs and OCs in food are much lower than that of the industrial countries of EU.

Furthermore, for the implementation of the Water Framework Directive 2000/60/EC and its daughter Directives 2008/105/EC and 2013/39/EC, the Water Development Department monitors a wide range of substances which include heavy metals, pesticides, polyaromatic hydrocarbons, PCBs, dioxins, etc., in water bodies (rivers, lakes, water reservoirs, groundwater), in recycled water and in sediments. The analyses are carried out by the State General Laboratory and by private laboratories. These substances include chemicals of the Annexes of Stockholm Convention.

### **2.3.9. Information.**

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

However, in general, the public neglects the dangers from POP emissions caused by the uncontrolled waste burning (mainly agricultural and domestic) in inhabited areas and landfill sites.

Information regarding emissions of persistent organic pollutants is given to managerial personnel during permitting of industrial installations.

### **3. STRATEGY AND IMPLEMENTATION PLAN**

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#### **3.1. Declaration of policy**

Recognising the unfavourable consequences of POP 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 POP 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 Laws of 2002 to 2018 and of the Integrated Pollution Prevention and Control Laws of 2003 to 2016, Best Available Techniques (BAT) have to be applied to new processes (especially for the incineration of waste) 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 POP 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 POP since as it is shown from the emission 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 POP 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 Control of Atmospheric Pollution Law of

2002 (2) to 2018 and the Industrial Emissions Law (Integrated Pollution Prevention and Control) 2013 and 2016.

Moreover, the operation of industrial processes producing fewer or no pollutants, included in Annex C of the Convention, is promoted. Within this framework the operation of small incinerators that cannot operate continuously will be limited since their emissions of POP are high due to the frequent start-up and shut-down procedures. Alternatively, high technology incinerators, operating on a continuous basis and with very low emissions will be permitted to be installed. As far as the disposal of clinical waste is concerned the sterilization method currently used will continue since it is satisfactory.

### **3.2.2. Internal evaluation of the effectiveness of the Convention**

Cyprus will contribute towards the effectiveness of the Convention by the assessment of the results of the emission inventory, the implementation of the strategy and the legislation of other departments such as the Department of Agriculture regarding the control of the uncontrolled burnings and the Department of the Environment regarding the permits of the installations.

### **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 in 2024.

## **3.3. Activities and Actions Programs.**

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

POP 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 is informed about all prohibitions and controls the import of chemical substances in Cyprus. 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, Rural Development and Environment and includes the following:

Decontamination of transformers ascertained to contain PCBs volume greater than 5 dm<sup>3</sup>.

The holder of any transformer detected to contain more than 5 dm<sup>3</sup> 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 laboratory 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 DE evidence regarding the commitment of the aforementioned person to decontaminate the fluid, and also regarding 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 the 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 sent 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 2016.

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

Based 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 sent 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 laboratory, so that to verify the content of the transformer in PCBs and submit the results to the DE
- 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 regarding 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 sent 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 off, it should be disposed off 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 laboratory, 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 it 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 sent 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).

### **3.3.3. Action Plan for the reduction of unintentional POP emission**

The POP 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 POP from industrial installations.**

##### Atmospheric emissions

The atmospheric emissions from industrial installations are regulated based on the Control of the Atmospheric Pollution Laws 2002 (2) to 2018 and the Industrial Emissions Law (Integrated Pollution Prevention and Control) 2013 and 2016 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 requirement, 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, Larnaca, 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 was sterilised and disposed off in landfill sites.

All major industrial sources that emit POP 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 POP 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 POP 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).

### **POP emissions from non-industrial sources – Uncontrolled burnings.**

#### Combustion of domestic solid waste in uncontrolled landfill sites

The aim of the Government is the promotion and the implementation of the hierarchy of the waste management (prevention, reuse, recycling, recovery, disposal) and only the residues from the processes at the Integrated Waste Management Facilities (IWMF), which cannot be further treated, are to be disposed at controlled landfill sites.

Before the commencement of the operation of the controlled sanitary landfill site for municipal waste at Marathounda, Pafos and the commencement of the operation of the controlled landfill sites for residues at the Koshi IWMF and the Pentakomo IWMF, municipal and other solid waste were disposed, without any pre-treatment, in various uncontrolled or semi-controlled landfill sites all over Cyprus. At these landfill sites, burning of waste was a common practice to reduce the volume of the waste. Furthermore, the self-ignition and slow-burning of disposed waste was a frequent problem that Local Authorities had to deal with, adding to the POP emissions released in the atmosphere.

The Ministry of Agriculture, Rural Development and Environment, after the commencement of the operation of the controlled landfill site for municipal solid waste at Marathounda, Pafos and the commencement of the operation of the controlled landfill sites for residues at the Koshi IWMF and the Pentakomo IWMF, gradually terminated the operation of the 115 Uncontrolled Landfill Sites (ULS) operating in Cyprus. Furthermore, the Ministry has promoted the procedure for the rehabilitation of the ULS. Therefore, POP emissions in the atmosphere from burning waste in landfill sites have been 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 POP. 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 set up of fire is prohibited in any point of the countryside. The set up of fire is only permitted during the months December – January to burn vineyard and fruit-trees residues, after the relevant permission 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 POP 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, using the appropriate treatment, to convert the dead animals to biogas, which is used for energy production. It is expected that POP 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 buildings under construction (paper and plastic bags, wood etc) is a common practice.

As it is ascertained by research implemented in other countries, POP 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 expected to be promoted 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 POP as well as particulates, especially when combustion is incomplete, as it is usually the case with small capacity boilers.

In order to prevent the increase of consumption of wood and other biomass, which is impregnated with paints or other substances and 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 informs the relevant Governmental and non-Governmental organisations for the consequences of these burnings through the operation of the Technical Committee for the monitoring of the implementation of the National Action Plan for the improvement of the air quality in Cyprus.

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 POP 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 POP 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 POP emissions. Moreover, research regarding the concentration levels of POP 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 (Municipalities Law (article 124 (1A)). An amendment of this Law is expected to be promoted by the Ministry of Interior in collaboration with DLI and the Union of Municipalities so that the Law can be applied extrajudicial.

## **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 requirement for the completeness of inventories so that the necessary measures required for the restriction of pollutant emissions included in Annex C of the Convention may be verified and confirmed.

### **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 to inform the public will be continued with different ways regarding the effects of POP 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, Rural Development 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 requirement 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.**

The sanitary landfill site at Marathounda, Pafos for municipal solid waste, covering Pafos district, is in full operation since June 2005. The abovementioned sanitary landfill site was constructed and it operates according to the Directive 99/31/EC for the sanitary landfill of waste. In addition, two controlled landfill sites for residues are operating at the Koshi IWMF and the Pentakomo IWMF covering Nicosia, Limassol, Larnaca and Ammochostos districts. The operation of the Uncontrolled Landfill Sites (ULS) in Cyprus were gradually terminated. The ULS in Pafos and Larnaca-Ammochostos districts were rehabilitated and are under environmental monitoring, according to the Directive 99/31/EC. The procedure for the rehabilitation of the ULS at Nicosia and at Limassol districts are expected to be completed by the second semester of 2022. Until the completion of these rehabilitation works, regular inspections of the landfill sites are carried out by government officers to ensure that all necessary and appropriate measures are implemented to prevent burning of waste.

### **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 POP 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.

For example, the cost for the construction of the two Integrated Waste Management Facilities (IWMMF) at Koshi and Pentakomo and the controlled sanitary landfill site for municipal solid waste at Marathounda, Pafos was approximately €100 million and the cost for the rehabilitation of the existing uncontrolled landfill sites in all districts is estimated at approximately €78 million.

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 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 on a periodic basis with new information regarding the measures taken for the reduction or restriction of 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 for the elimination of the use of the chemical substances included in the Convention's Annexes as well as for 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

### A. Inspection of surface water for the presence of POP.

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) and the Daughter Directives 2008/105/EC and 2013/39/EC in order to determine the chemical status of water bodies, water samples are analysed for the presence of organic pollutants including POP, including e.g. analyses for the presence of dioxins in sediments.

The Water Development Department conducts surface water sampling and analysis of persistent organic pollutants, notably pesticides and PCBs in the water. The analyses of the samples for priority substances are carried out by the State General Laboratory for some substances, while certain analyses are also undertaken by private laboratories through public contracts.

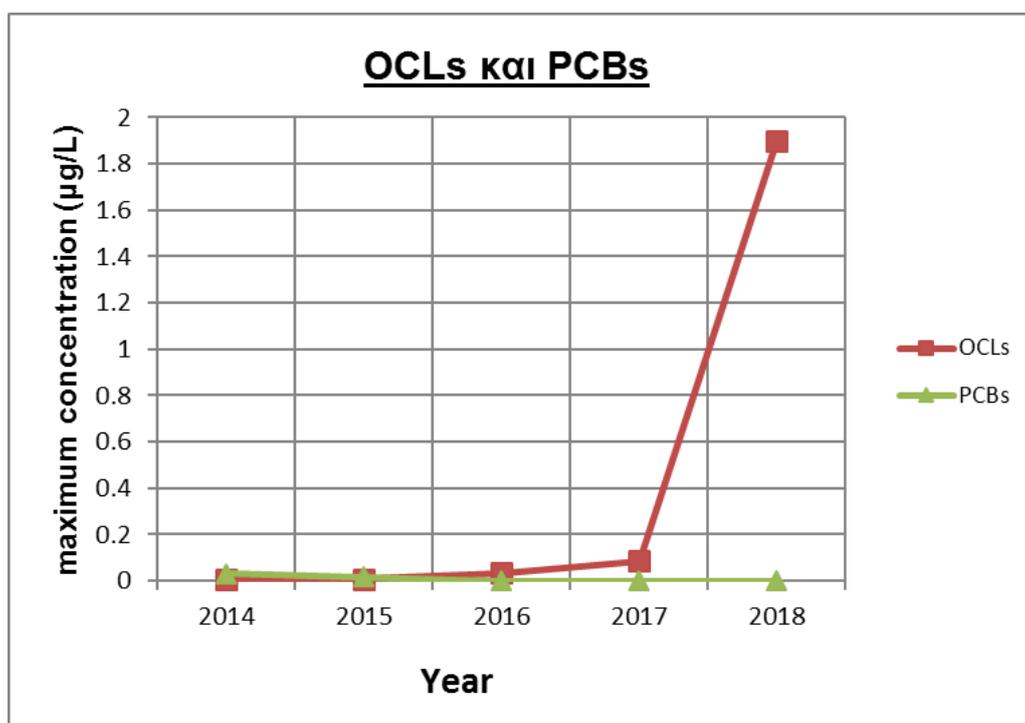
Pesticides and PCBs that are monitored in surface waters (rivers, natural lakes, water reservoirs) are shown in the following Table (Table 1):

**Table 1:** Organochlorinated pesticide products and polychlorinated biphenyls (PCBs) checked in 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	HCH-gamma (LINDANE)	12	PCB 138
13	PENTACHLOROBENZENE	13	PCB 185
14	ISODRIN	14	PCB 180
15	Total DDTs	15	PCB 194
16	ENDOSULFAN	16	PCB 206
17	HCH-alpha	17	PCB 209

18	HCH-beta		
19	Iprodione		
20	Penconazole		

Figure 1 shows the maximum concentrations of organochlorinated pesticide products (OCLs) and polychlorinated biphenyls (PCBS) that were detected in a surface water sample in each of the years 2014 – 2018.



**Figure 1:** Results of organochlorinated pesticide products (OCLs) and polychlorinated biphenyls (PCBS) in surface water (2014-2018)

All detections above LoQ (Limit of Quantification) of organochloride pesticides and PCBs in surface water samples during 2014-2018 are shown in Tables 2 and 3 below, respectively. Please note that there were no detections of PCBs during 2016-2018, and consequently no corresponding results are shown in Table 3.

**Table 2:** Detections of Organochloride pesticides in surface water samples during 2014-2018

Location ID	Location Name	Parameter ID	Measurement Date	Value	Unit
r9-6-4-92	Kouris @ Alassa New Weir	HCH-alpha	04/03/2014	0,002	µg/l
r6-1-5-52	Vathys @ Athalassa Park	HCH-alpha	05/03/2014	0,007	µg/l
r8-3-2-60	Kalo Chorio R. @ Kamares	HCH-alpha	05/03/2014	0,008	µg/l
r6-5-2-85	Alykos d/s Dhali Industrial Area	HCH-alpha	31/10/2014	0,005	µg/l
r9-1-3-80	Argaki tis Monis near Moni	Dieldrin	10/02/2015	0,006	µg/l
r9-5-1-99	Ypsonas near Ypsonas	HCH-alpha	11/02/2015	0,008	µg/l
d9-4-3-95_DLP	Polemida Res. Deepest Lake Point	Endosulfan	02/12/2015	0,008	µg/l
r3-7-1-55	Peristerona R. @ Siphilos	Penconazole	13/04/2016	0,023	µg/l
r3-2-1-85	Marathasa U/S Kalopanagiotis Dam	Iprodione	01/12/2016	0,035	µg/l
r9-2-3-05	Germasogeia R. @ Dierona	Iprodione	06/12/2016	0,033	µg/l

r9-6-5-62	Agros River Near Ag. Ioannis	Iprodione	26/04/2017	0,085	µg/l
L8-3-2-82_Stn3	Larnaca Main Salt Lake Station 3	Endosulfan	27/04/2017	0,008	µg/l
L8-1-2-94_BNK	Oroklini Lake @ weir	Endosulfan	16/05/2017	0,01	µg/l
L8-1-2-94_BNK	Oroklini Lake @ weir	4,4-DDD	06/06/2017	0,0009	µg/l
L8-1-2-94_BNK	Oroklini Lake @ weir	Endosulfan	06/06/2017	0,01	µg/l
L9-5-3-50_Stn1	Akrotiri Salt Lake (site 1)	4,4-DDT	07/06/2017	0,002	µg/l
L8-1-2-94_BNK2	Oroklini Lake near Birdwatching Tower	4,4-DDT	27/06/2017	0,0008	µg/l
r9-6-5-62	Agros River Near Ag. Ioannis	Iprodione	09/11/2017	0,074	µg/l
L8-1-2-94_BNK	Oroklini Lake @ weir	4,4-DDE	24/05/2018	1,9	µg/l
L8-1-2-94_BNK	Oroklini Lake @ weir	Penconazole	24/05/2018	1,7	µg/l
L8-1-2-94_BNK2	Oroklini Lake near Birdwatching Tower	4,4-DDE	14/06/2018	0,1	µg/l
r9-6-5-62	Agros River Near Ag. Ioannis	Iprodione	11/09/2018	0,145	µg/l

\*The result 4,4-DDE = 1,9 µg/l of Lake Oroklini is an isolated random detection.

**Table 3:** Detections of PCBs in surface water samples during 2014-2018\*

Location ID	Location Name	Parameter	Measurement Date	Value	Unit
d9-4-3-95_DLP	Polemida Res. Deepest Lake Point	PCB 029	10/12/2014	0,032	µg/l
r3-5-4-40	Elia near Vyzakia	PCB 047	2/12/2014	0,01	µg/l
r8-3-2-60	Kalo Chorio R. @ Kamares	PCB 029	14/1/2014	0,021	µg/l
r8-9-5-40	Vasilikos near Lageia	PCB 029	21/1/2014	0,006	µg/l
L7-2-6-70_Stn1	Paralimni Lake near Vathys river mouth	PCB 028	28/1/2015	0,016	µg/l

\* Note: There were no detections of PCBs during 2016-2018.

For the monitoring of dioxins in sediments, sediment samples are taken from the bottoms of water reservoirs and natural lakes once a year (June-July). Sediments are also sampled once a year from selected rivers for this purpose.

The dioxins analyzed are listed below:

### **Dioxins and dioxin-like compounds**

7 polychlorinated dibenzo-p-dioxins (PCDD): 2,3,7,8-T4CDD (CAS 1746-01-6), 1,2,3,7,8-P5CDD (CAS 40321-76-4), 1,2,3,4,7,8-H6CDD (CAS 39227-28-6), 1,2,3,6,7,8-H6CDD (CAS 57653-85-7), 1,2,3,7,8,9-H6CDD (CAS 19408-74-3), 1,2,3,4,6,7,8-H7CDD (CAS 35822-46-9), 1,2,3,4,6,7,8,9-O8CDD (CAS 3268-87-9)

10 polychlorinated dibenzofurans (PCDF): 2,3,7,8-T4CDF (CAS 51207-31-9), 1,2,3,7,8-P5CDF (CAS 57117-41-6), 2,3,4,7,8-P5CDF (CAS 57117-31-4), 1,2,3,4,7,8-H6CDF (CAS 70648-26-9), 1,2,3,6,7,8-H6CDF (CAS 57117-44-9), 1,2,3,7,8,9-H6CDF (CAS 72918-21-9), 2,3,4,6,7,8-H6CDF (CAS 60851-34-5), 1,2,3,4,6,7,8-H7CDF (CAS 67562-39-4), 1,2,3,4,7,8,9-H7CDF (CAS 55673-89-7), 1,2,3,4,6,7,8,9-O8CDF (CAS 39001-02-0)

12 polychlorinated biphenyls similar to dioxins (PCB-DL): 3,3',4,4'-T4CB (PCB 77, CAS 32598-13-3), 3,3',4',5-T4CB (PCB 81, CAS 70362-50-4), 2,3,3',4,4'-P5CB (PCB 105,

CAS 32598-14-4), 2,3,4,4',5-P5CB (PCB 114, CAS 74472-37-0), 2,3',4,4',5-P5CB (PCB 118, CAS 31508-00-6), 2,3',4,4',5'-P5CB (PCB 123, CAS 65510-44-3), 3,3',4,4',5-P5CB (PCB 126, CAS 57465-28-8), 2,3,3',4,4',5-H6CB (PCB 156, CAS 38380-08-4), 2,3,3',4,4',5'-H6CB (PCB 157, CAS 69782-90-7), 2,3',4,4',5,5'-H6CB (PCB 167, CAS 52663-72-6), 3,3',4,4',5,5'-H6CB (PCB 169, CAS 32774-16-6), 2,3,3',4,4',5,5'-H7CB (PCB 189, CAS 39635-31-9)

Table 4 shows the monitored detections for total dioxins (dioxins and dioxins-like compounds) during 2018-2019.

**Table 4:** Detections of total dioxins in sediments of water reservoirs during 2018-2019.

Location ID	Water body type	Location Name	Parameter	Measurement Date	Value	Unit
d1-3-9-50_DLP	Reservoir	Asprokremmos Res. Deepest Lake Point	Total Dioxins	4/7/2019	0,0012	µg/Kg dw
d3-7-3-83_DLP	Reservoir	Akaki-Malounda Res. Deepest Lake Point	Total Dioxins	13/6/2019	0,0027	µg/Kg dw
d6-1-2-05_DLP	Reservoir	Tamassos Res. Deepest Lake Point	Total Dioxins	11/9/2018	0,0016	µg/Kg dw
d6-1-2-05_DLP	Reservoir	Tamassos Res. Deepest Lake Point	Total Dioxins	18/6/2019	0,0027	µg/Kg dw
d8-7-2-05_DLP	Reservoir	Lefkara Res. Deepest Lake Point	Total Dioxins	2/7/2019	0,001	µg/Kg dw
d8-7-4-05_DLP	Reservoir	Dipotamos Res. Deepest Lake Point	Total Dioxins	12/6/2018	0,0005	µg/Kg dw
d8-9-5-60_DLP	Reservoir	Kalavassos Res. Deepest Lake Point	Total Dioxins	13/6/2018	0,001	µg/Kg dw
d9-2-5-20_DLP	Reservoir	Germasogeia Res. Deepest Lake Point	Total Dioxins	20/6/2018	0,0005	µg/Kg dw
d9-6-9-10_DLP	Reservoir	Kouris Res. Deepest Lake	Total Dioxins	3/7/2019	0,0026	µg/Kg dw
L8-1-2-94_BNK2	Lake	Oroklini Lake near Birdwatching Tower	Total Dioxins	05/07/2018	0,0016	µg/Kg dw
r3-5-4-40	River	Elia near Vyzakia	Total Dioxins	24/04/2018	0,0017	µg/Kg dw
r9-4-3-80	River	Garyllis U/S Polemidia Dam	Total Dioxins	23/05/2018	0,0007	µg/Kg dw

## **B. Food inspection for the presence of organochlorine pesticides, dioxins, furans and PCBs.**

Since 1983, the State General Laboratory begun the inspection and monitoring of the levels of some POP 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 3 and 4 show the levels of the sum of dioxins and dioxin –like PCBs observed in 2018. It is noted that the levels of dioxins, furans, PCBs and OCIs in Cyprus are very low as compared with the maximum acceptable levels.

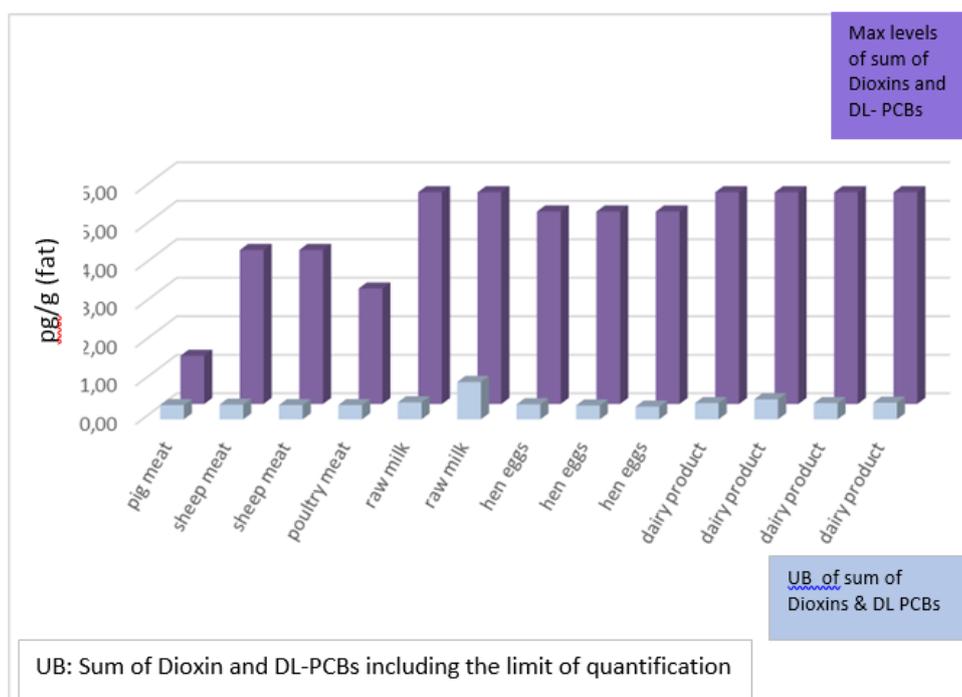
At the Pesticide Residues (PR) Laboratory of SGL food of plant origin is analyzed systematically since 2017, and monitoring is performed among other pesticides, for Aldrin, Dieldrin, Endosulfans, Endrin, b-hexachlorocyclohexane, Heptachlor, ppDDE and Lindane. In 2017 and 2018 approximately 300 and 400 foodstuff samples were analyzed for the above mentioned POP respectively. No

quantifiable residues were found with the exception of two carrot samples analyzed in 2017 where ppDDE was detected at concentrations lower than MRL.

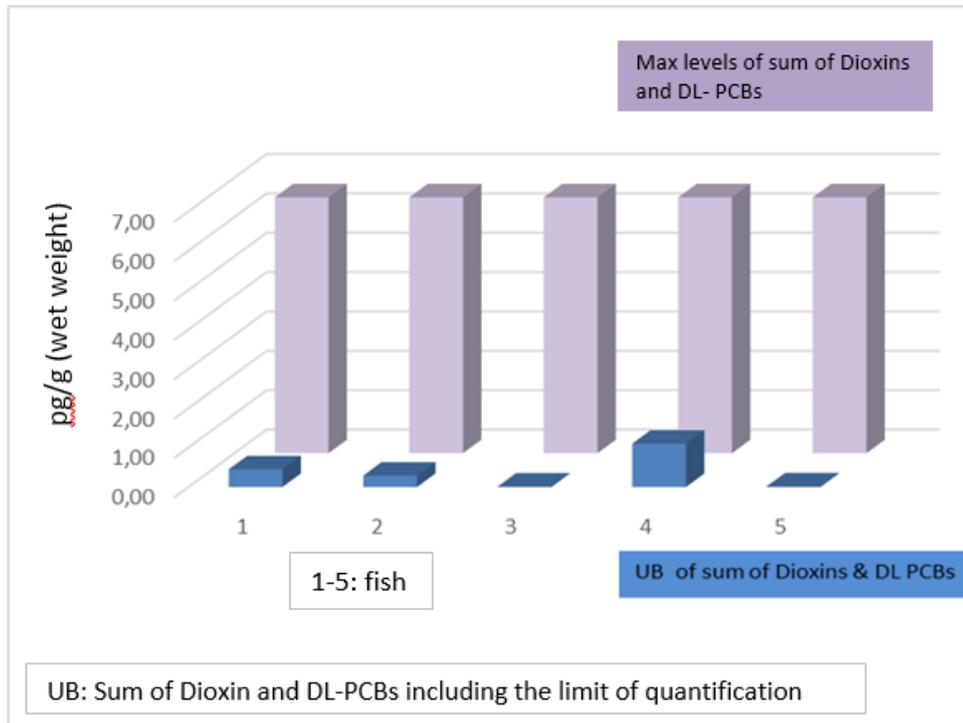
For the analysis of animal origin samples, the (PR) Laboratory of SGL participates in the following programs:

- Monitoring of milk, eggs, meat, fish and honey samples as defined by the Veterinary services of the Ministry of Agriculture, Rural development and Environment and the PR of SGL. The samples are analyzed among other pesticides for the 15 POP such as a- HCH, b- HCH, Lindane, Heptachlor, Hexachlorobenzene, Aldrin, Dieldrin, Endrin, opDDE, ppDDE, opDDD, ppDDD, opDDT, ppDDT and for PCBs 28, 52, 101, 153, 138 and 180. Within the years 2014 - 2018 samples were found positive for DDT, Hexachlorobenzene, b-HCH, Dieldrin, Endrin and PCBs in concentrations much lower than the MRL.
- Medpol Program for the examination of Mediterranean pollution in collaboration with the Department of Fisheries and Marine Research. In this program, samples of the fish type *Mullus Barbatus* are analyzed for Hexachlorobenzene, Lindane, ppDDE, Hexachlorobutadiene and PCBs. Within the years 2014 – 2018 samples were found positive for ppDDE in concentrations lower or equal to 0.02mg/kg. The concentrations found for the sum of PCBs were much lower than the maximum levels.
- Coordinated multi annual control program of the Union. Within the years 2014 - 2018 samples of animal origin were analyzed for the POP Aldrin, Chlordane, Dieldrin, Heptachlor, Hexachlorobenzene, a-hexachlorocyclohexane, Lindane, Endosulfans and DDT, among other pesticides. Within the years 2014 - 2018, DDT was detected in nine animal fat samples at concentrations between 0.012 - 0.090mg/kg. In three butter samples DDT was detected at concentrations less or equal to 0.026mg/kg and one milk sample was detected with traces of DDT. All observed concentrations were much lower than the MRL.

The results for sum of Dioxins and Dioxin-like PCBs for the year 2018 are shown in the following Figures 3 and 4.



**Figure 3:** Sum of Dioxin and Dioxin Like-PCBs (pg/g (fat))



**Figure 4:** Sum of Dioxin and Dioxin Like-PCBs (pg/g (wet weight))

## -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	02/74/326 2	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	02/74/327 6	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

Holder of the transformer	Manufacturer	Number	Possible concentration PCBs (ppm)
Vasiliko Cement Works Ltd	SIEMENS	-----	58
Vasiliko Cement Works Ltd	SIEMENS	TM22850 9	58
Vasiliko Cement Works Ltd	SIEMENS	TM22851 1	51

**TABLE B: Capacitors which may contain PCBs**

<b>Onwer</b>	<b>Manufacturer</b>	<b>Number</b>
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 & PHILLIPS 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
decaBDE	Decabromodiphenyl ether
DE	Department of Environment
DF	Department of Forests
DFMR	Department of Fisheries and Marine Research
DLI	Department of Labour Inspection
dm	decametre
EIONET	European Environment Information and Observation Network
EMEP	European Monitoring and Evaluation Program
EMU	Economic and Monetary Union
EPRT	European Pollutant Release and Transfer Register
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 Insurance
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
PRL	Pesticide Residues Laboratory
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
SCCP	Short-chain chlorinated parafines
SGL	State General Laboratory
SMP	Strategic Management Plan
SRSS	Structural Reform Support Service
STW	Station for the Transshipment of Waste
TEQ	Toxic Equivalent
ULS	Uncontrolled Landfill Site
UNEP	United Nations Environment Program
VAT	Value added tax
WHO	World Health Organisation
WDD	Water Development Department
2,3,7,8- Cl <sub>4</sub> DD	2,3,7,8 tetrachlorodibenzo-p-dioxin