MINISTRY OF ENVIRONMENT AND URBANIZATION

National Implementation Plan of Persistent Organic Pollutants (POPs) Management in Turkey

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Abbreviations

BEP	Best Environmental Practices	**NPC**	National Project Coordinator
BAT	Best Available Techniques	**PAHs**	Polycyclic Aromatic Hydrocarbons
CLRTAP	Convention on Long Range Transboundary Air Pollution	**PBDEs**	Polybrominated Diphenyl Ethers
COP	Conference of Parties	**PCBs**	Polychlorinated Biphenyls
DDD	Dichloro diphenyl dichloroethane	**PNCB**	Para-nitrochlorobenzene
DDE	Dichloro diphenyldichlor ethylene	**PCDD/Fs**	Polychlorinated dibenzo-p-dioxins and furans
DDT	Dichloro diphenyl trichloro ethane	**PCNs**	Polychlorinated naphthalenes
EC	European Community	**PCP**	Pentachlorophenol
EMRA	Energy Market Regulatory Authority	**PCTs**	Polychlorinated terphenyls
EPI	Electricity Production Inc.	**PETKIM**	Petrochemical Inc
EÜAŞ	Turkish Electricity Production Inc.	**PFOS**	Perfluorinated octanesulfonic acid
HBCD, HBCDD	Hexabromocyclododecane	**PFOSF**	Perfluorinated Octanesulfonyl Fluoride
HCB	Hexachlorobenzene	**POPs**	Persistent organic polutants
HCHs	Hexachlorocyclohexanes	**RSHC**	Refik Saydam Hygiene Center
IESER	Institute of Energy Systems and Environmental Research	**SCCPs**	Short-chain chlorinated paraffins
IFCS	International Federation of Classification Societies	**TURKSTAT**	Turkish Statistics Institute
IPPC	Integrated Pollution Prevention and Control	**TÇMB**	Turkish Cement Manufacturers' Association
IRCMS	Institute of Research on Continent and Marine Science	**TEDAŞ**	Turkish Electricity Distribution Inc.
İSTAÇ A.Ş.	İstanbul Municipality Environmental Protection and Waste Management Inc.	**TEİAŞ**	Turkish Electricity Transmission Inc.
İZAYDAŞ	İzmit Waste Storage and Incineration Inc.	**TEF**	Toxicity equivalency factor
MoD	Ministry of Development	**TEQ**	Toxic equivalent
MoENR	Ministry of Energy and Natural Resources	**TEQ/A**	Toxic equivalent of dioxin per year
MoENROI	Ministry of Energy and Natural Resources and other PCB containing equipment owner institutions	**TÜBİTAK**	Turkish Scientific and Technological Research Institution
MoEU	Ministry of Environment and Urbanization	**TÜBİTAK-MAM**	Turkish Scientific and Technological Research Institution - Marmara Research Center
MoFAL	Ministry of Food, Agriculture and Livestock	**TÜPRAŞ**	Turkish Petroleum Refineries Inc.
MoH	Ministry of Health	**ug TEQ/t**	µg of toxic equivalent of dioxin per ton
MoFWA	Ministry of Forestry and Water Affairs	**UC**	Undersecreteriat of Customs
MoLSS	Ministry of Labour and Social Security	**UNEP**	United Nations Environment Programme
MoSIT	Ministry of Science, Industry and Technology	**UNFCCC**	United Nations Framework Convention on Climate Change
MSDS	Material Safety Data Sheet	**UNIDO**	United Nations Industrial Development Organization
NGOs	Non-Governmental Institutions	**UoFT**	Undersecreteriat of Foreign Trade
NPC	National Project Coordinator	**uPOPs**	Unintentionally produced POPs (by products)
NIP	National Implementation Plan	**γ-HCH**	Gamma isomer of 1,2,3,4,5,6-hexachlorocyclohexane (also Lindane)

EXECUTIVE SUMMARY

Persistent Organic Pollutants (POPs) are the chemicals that can remain without undergoing degradation in the environment for a long time (persist), be transported long distances, accumulate in living organisms fatty tissues and pose a high risk on environment and human health. It is known that these chemicals are identified as hazardous not only nationwide but also worldwide since they are subjected to long range transport and can even be detected in areas which none of these chemicals are produced or used.

They are a subject of broad international interest on the global and regional scales. The global international agreement – Stockholm Convention on Persistent Organic Pollutants (SC) – is a global treaty focused on the protection of human and environment against this group of harmful chemicals. Very important regional activities are connected with the Convention on Long Range Transboundary Air Pollution (CRLTAP) of the United Nation Economic Commission for Europe (UN ECE) and its POPs Protocol. Both conventions are included the chemical legislation of European Union.

As a part of the UNIDO Project, the draft of updated SC NIP was prepared, but this draft was not quite adequate to the considerations and approaches of the MoEU and from this reason, the broader document was prepared as a part of the EU project of the Technical Assistance for the Implementation of the Persistent Organic Pollutants Regulation. This document is focused on the management of POPs problems in Turkey and implementation of the Stockholm Convention on POPs, CRLTAP/POPs Protocol and EU POPs Regulation.

A draft by-law is necessary for the full implementation of POPs legislation in Turkey so transposition of EU Legislation is essential.

The existence of an institutional and organizational framework for supporting the implementation of the POPs legislation should be supported with legislation.

The identification of competent authorities, relevant authorities and stakeholders and their participation/involvement in management process on the implementation of the legal requirements should be defined in the draft by-law in order to ascertain their active participation in the management of POPs especially in decision making process.

Since there are several ministries/organizations dealing with POPs a Joint Management Committee for the management of POPs is essential. Some joint management mechanisms have been formally established pursuant to the provisions of laws and regulations as Chemicals Advisory Committee. In line with the Article 8 of By-law on the Classification, Packaging and Labelling of Dangerous Substances and Preparations in order to harmonize the national policy and ensure information exchange between relavant institutions, the Chemicals Advisory Committee established under the co-odination of Ministry of Environment and Urbanization.

Very important for the future implementation of Conventions measures is to establish and support the permanent POPs national inventory team(s) which will continue in inventory of obsolete stocks, wastes, emissions, releases, contaminated sites and potential exposure of POPs. At the same level of significance is to prepare design of the national POPs monitoring network as a part of the national environmental monitoring network established on the CRLTAP/EMEP and SC/GMP rules and considerations. For implementation and management of POPs problems in Turkey, the control mechanism and evaluation of the effectiveness evaluation of the Convention measures have to be clearly defined and established.

1. Introduction

1.1. Persistent Organic Pollutants (POPs) and International POPs regulation

Persistent Organic Pollutants (POPs) are the chemicals that can remain without undergoing degradation in the environment for a long time (persist), be transported long distances, accumulate in living organisms fatty tissues and pose a high risk on environment and human health. It is known that these chemicals are identified as hazardous not only nationwide but also worldwide since they are subjected to long range transport and can even be detected in areas which none of these chemicals are produced or used.

POPs are a subject of broad international interest on the global and regional scales. The global international agreement – Stockholm Convention on Persistent Organic Pollutants (SC) – is a global treaty focused on the protection of human and environment against these groups of harmful chemicals. Very important regional activities are connected with the Convention on Long Range Transboundary Air Pollution (CRLTAP) of the United Nation Economic Commission for Europe (UN ECE) and its POPs Protocol. Both conventions are included the chemical legislation of European Union.

The aim of the Stockholm Convention and the CRLTAP/POPs Protocol is to evaluate the problems related to the substances named persistent organic pollutants (POPs) or the substances having the same characteristics. These substances classified are classifies Persistent Organic Pollutants because of the characteristics listed below:

- Toxic effects on living organisms (especially as a reason for endocrine disruption).
- Accumulating in fatty (adipose) tissue in organisms,
- Persistency (because of the stable structure, resist to undergo any photolytic, chemical and biological reactions),
- Semi-volatile characteristics (therefore, POPs are subject of long range transport and posing a global environmental problem

A total of 23 Persistent Organic Pollutants, 12 initial and 11 can be seperated to 3 groups by their characteristics and areas of use which are pesticides, industrial chemicals and unintentionally produced POPs. They can also be seperated to 3 different groups by considering the annexes of convention. **Assignment to SC Annexes A, B, C** is presented in **Table 1.** Some additional information about the SC POPs are summerized in the **Annex I.**

POPs Protocol in Annex I contents substances scheduled for elimination, this annex shall not apply to the substances listed there when they occur: (i) as contaminants in products; or (ii) in articles manufactured or in use by the implementation date; or (iii) as site-limited chemical intermediates in the manufacture of one or more different substances and are thus chemically transformed. Ammenmends of Protocol specified obligation connected with newly listed POPs.

Annex II is focused on the substances scheduled for restrictions on use, this annex shall not apply to the substances listed there when they occur: (i) as contaminants in products; or (ii) in articles manufactured or in use by the implementation date; or (iii) as site-limited chemical intermediates in the manufacture of one or more different substances and are thus chemically transformed.

Annex III defines the reference years for the reduction of emission of unintentionally produced POPs. The additional annexes of Protocol define the emission limits for selected technologies and sources of these POPs including detailed lists of best available techniques for the reduction of these emissions.

Assignment to Protocol Annexes A, B, C is presented in **Table 1.** Some additional information about the Protocol POPs are summerized in the **Annex I.**

Candidate POPs of both Conventions are presented in Table 2.

Table 1: The List of SC and CRLTAP Persistent Organic Pollutants

Stockholm Convention			
Annex A (Prohibition)	Aldrin	Chlordane	Chlordecone
	Dieldrin	Endrin	Heptachlor
	Hexabromobiphenyl	Hexabromodiphenyl ether and heptabromodiphenyl ether	Hexachlorobenzene (HCB)
	Alpha-hexachlorocyclohexane	Beta-hexachlorocyclohexane	Lindane
	Mirex	Pentachlorobenzene	Polychlorinated biphenyls (PCBs)
	Technical endosulfan and its related isomers	Tetrabromodiphenyl ether and pentabromodiphenyl ether	Toxaphene
	Hexabromocyclododecane		
Annex B (Restriction)	DDT	Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	
Annex C (Reduction)	Polychlorinated dibenzo-p-dioxin (PCDDs)	Polychlorinated dibenzofurans (PCDFs)	Hexachlorobenzene (HCB)
	Pentachlorobenzene	Polychlorinated biphenyls (PCBs)	

POPs Protocol CRLTAP			
Annex I (Elimination)	Aldrin	Chlordane	Chlordecone
	DDT	Dieldrin	Endrin
	Heptachlor	Hexabromobiphenyl	Hexabromodiphenyl ether and heptabromodiphenyl ether
	Hexachlorobenzene (HCB)	Hexachlorobutadiene	Hexachlorocyclohexanes
	Mirex	Pentachlorobenzene	Perfluorooctane sulfonate

	Polychlorinated biphenyls (PCBs) ▲	Polychlorinated naphthalenes ▲	Short-chain chlorinated paraffins (SCCPs) ▲
	Tetrabromodiphenyl ether and pentabromodiphenyl ether ▲	Toxaphene ●	
Annex II (Restriction of use)	DDT ●	Hexachlorocyclohexanes ●	Perfluorooctane sulfonate ▲
	Polychlorinated biphenyls (PCBs) ▲	Short-chain chlorinated paraffins (SCCPs) ▲	
Annex III (Reduction of emissions)	Polycyclic aromatic hydrocarbons ■	Polychlorinated dibenzo-p-dioxin (PCDDs) ■	Polychlorinated dibenzofurans (PCDFs) ■
	Hexachlorobenzene (HCB) ■	Polychlorinated biphenyls (PCBs) ■	

Pesticide ● Industrial Chemical ▲ Unintentional Production ■

Table 2: Candidate POPs of SC and CRLTAP

Stockholm Convention			
Under Review	Dicofol ●	Decabromodiphenyl ether ▲	Hexachlorobutadiene ▲
	Pentachlorophenol and pentachloroanisol ● ▲	Polychlorinated naphthalenes ▲	

POPs Protocol CRLTAP			
Under review	Dicofol ●	Endosulfan ●	Hexabromocyclododecane ▲
	Pentachlorophenol and pentachloroanisol ● ▲	Trifluralin ●	

1.2. Stockholm Convention

Stockholm Convention is an international convention which is primarily constituted up onto elimination or reduction of POPs releases of Parties to the Convention by making sure to take precautions.

Until '90s, no serious step has been taken on the issue of POPs in global means except for some prohibitions. In 1995 United Nations Environment Programme (UNEP) took a council decision and requested primarily to make an assessment of the 12 persistent organic pollutants called dirty dozen from the Inter-Organization Programme for the Sound Management of Chemicals (IOMC). As a result of this assessment UNEP decided to prepare a binding convention regarding these 12 chemicals as a first step. This convention is signed by 125 countries including Turkey on the 23rd of May 2001 in Stockholm.

Stockholm Convention is effective by May 17th 2004 and 179 countries or local instutions are Parties to the Convention as of 2014. Convention is focused to eliminate or reduce the releases of first 12 POPs since the date it is first effective on and 10 additional POPs listed in 2009-2010. The Convention guarantees eliminating the use of some chemicals step by step for some usage areas.

Stockholm Convention's main objectives can be discussed by the five subjects given below.

I. Control Measures

i. Control measures related to the POPs produced intentionally
- Banning of 18 POPs mentioned in Annex-A, banning of production and usage, preventing/ minimizing the exposure and the releases to the environment,
- Stopping the production of hexabromobiphenyl and (tetra-penta-hexa-hepta) bromodiphenylether immediately and banning the usage of materials containing PCB until the year 2025,
- Prioritizing the ban of materials containing PCBs high amounts and making an effort to identify, label and cease the usage of materials/articles containing PCBs more than 50 ppm
- Stop allowing the trade of materials containing PCBs excluding environmentally sound management of wastes and banning the recycling of liquids containing PCBs more than 50 ppm
- Providing an environmentally sound management of PCBs wastes until 2028
- Withdrawing the registries for the specific exemptions for (tetra-penta-hexa-hepta) bromodiphenylether until 2030 and every party should comply with the limit values specific to the exported country while exporting (tetra-penta-hexa-hepta) bromodiphenylether or their derivatives and register for a specific exemption request to the Secretariat,
- Submitting the progress reports to the Conference of Parties in 5 year periods.
- Banning the production and use of DDT and PFOS in Annex B in all countries excluding the ones registered for specific exemptions,
- Limiting the trade of chemicals mentioned in Stockholm Convention Annex A, B and only permitting export and import under environmentally sound conditions.
- Establishing evaluation programs to monitor new or present industrial chemicals and pesticides for their persistent organic pollutant characteristics in accordance with the criteria set in Annex D of the Convention in a periodic basis.

ii. Control measures related to the unintentionally produced POPs
- Minimizing or eliminating (if possible) the release of dioxin/furan, HCB, PCBs and PeCB mentioned in Annex C.
- Preparing action plans and implementing them after the Convention is effective for 2 years
- Evaluating the present and planned releases, developing strategies to reduce the releases, preparing programs to implement the action plans, evaluating the present law and policy efficiencies, reviewing the progress of the strategies every 5 years and submitting the progress reports to the Conference of Parties
- Encouraging to take present, suitable and applicable precautions to reduce the releases in significant amounts and a realistic manner
- Encouraging improvements to prevent production and release of POPs mentioned in Annex C and encouraging the usage of alternative or improved materials, product and production processes,
- Encouraging the use of BAT/BEP in industrial source categories listed in Annex C Section II-III and beginning to use applicable BAT in new POPs resources after the Convention is effective for 4 years,

iii. Control measures related to stored and waste POPs
- Developing and implementing the strategies in order to identify the currently used POPs stocks, products containing POPs, items and wastes

- Making sure the stocks are safe, effective and managed in an environmentally sound manner, taking precautions for collection, transport and storage until the stockpiles are considered to be waste, providing environmentally sound management methodologies to dispose the POPs containing waste according to the international terms, standards and guidelines.
- Not permitting the use of POPs alternatively or directly and their recovery and recycling
- Not permitting the transport these materials cross-borders unless complied with the international rules (like Basel Convention)
- Making an effort to develop strategies in order to identify the contaminated areas and if rehabilitation of the site is necessary, making sure it is carried out in an environmentally sound manner,

II. Addition of new POPs to the Convention

- Evaluating the new POPs candidate substances reported by the countries screened by the criteria set in Annex D

III. General Obligations

- Assigning national focal point,
- Taking measures information sharing, awareness raising and training of public
- Monitoring, research and development studies of POPs and POPs alternatives

IV. Implementation Plans

- Preparing National Implementation Plan (NIP)
- Submitting the NIP after the Convention is effective for 2 years
- Updating the NIP according to the rules set by the Conference of Parties (COP)

V. Financial and Technical Aid

- Technical and financial assistance for the countries which are developing and has transiting economies
- Establishing local and sub-local centers to the countries in the need of capacity building and technology transfer
- Providing technical and financial assistance by the developed countries to the developing countries afford the implementation costs

1.3. CRLTAP & POPs Protocol

The Convention on Long-range Transboundary Air Pollution is one of the central means for protecting regional environment. It has, over the years, served as a bridge between different political systems and as a factor of stability in years of political change. It has substantially contributed to the development of international environmental law and has created the essential framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution. It is a successful example of what can be achieved through intergovernmental cooperation.

Since 1979 the Convention on Long-range Transboundary Air Pollution has addressed some of the major environmental problems of the UNECE region through scientific collaboration and policy negotiation. The Convention has been extended by eight protocols that identify specific measures to be taken by Parties to cut their emissions of air pollutants. The Convention, which now has 51 Parties identifies the Executive Secretary of UNECE as its secretariat.

The aim of the Convention is that Parties shall endeavor to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution. Parties develop policies and strategies to combat the discharge of air pollutants through exchanges of information, consultation, research and monitoring.

The Executive Body adopted the Protocol on Persistent Organic Pollutants on 24 June 1998 in Aarhus (Denmark). It focuses on a list of 16 substances that have been singled out according to agreed risk criteria. The substances comprise eleven pesticides, two industrial chemicals and three by-products/contaminants.

The ultimate objective is to eliminate any discharges, emissions and losses of POPs. The Protocol bans the production and use of some products outright - aldrin, chlordane, chlordecone, dieldrin, endrin, hexabromobiphenyl, mirex and toxaphene. Others are scheduled for elimination at a later stage - DDT, heptachlor, hexaclorobenzene, PCBs. Finally, the Protocol severely restricts the use of DDT, HCH (including lindane) and PCBs.

The Protocol includes provisions for dealing with the wastes of products that will be banned.

It also obliges Parties to reduce their emissions of dioxins, furans, PAHs and HCB below their levels in 1990 (or an alternative year between 1985 and 1995). For the incineration of municipal, hazardous and medical waste, it lays down specific limit values.

On 18 December 2009, Parties to the Protocol on POPs adopted decisions 2009/1, 2009/2 and 2009/3 to amend the Protocol to include seven new substances:

- Hexachlorobutadiene
- Octabromodiphenyl ether
- Pentachlorobenzene
- Pentabromodiphenyl ether
- Perfluorooctane sulfonates
- Polychlorinated naphthalenes
- Short-chain chlorinated paraffins.

Furthermore, the Parties revised obligations for DDT, heptachlor, hexachlorobenzene and PCBs as well as emission limit values (ELVs) from waste incineration.

Parallel to this, with a view to facilitating the Protocol's ratification by countries with economies in transition, the Parties introduced flexibility for these countries regarding the time frames for the application of ELVs and best available technologies (BAT) (15 years).

Finally, the Parties adopted decision 2009/4 to update guidance on BAT to control emissions of POPs in annex V and turn parts of it into a guidance document (ECE/EB.AIR/2009/14). New facilities - 0.1 ng m^{-3} PCDDs/Fs, agglomeration and secondary steel production – 0.5 ng m^{-3} PCDDs/Fs. These amendments have not yet entered into force for the Parties that adopted them.

Task Force on POPs realized during years 2009-2010 review of following substances:

- Trifluralin
- Dicofol
- Endosulfan
- Pentachlorofenol + Pentachloroanisol
- Hexabromocyclododecane (HBCDD)

1.4. EU Regulations

The EC POPs Regulation is the implementing legislation in the EU Member States of the Stockholm Convention. It is also the implementing legislation for the 1998 POPs Protocol of the 1979 United Nations Economic Commission for Europe (UNECE) Long Range Transboundary Air Pollution Convention (CLRTAP).

EC Persistent Organic Pollutants (POPs) Regulation No. 850/2004 of 29 April 2004 for the protection of human health and the environment plus new amendments concerning to newly adopted POPs. Whereas this Regulation primarily concerns environmental protection and the protection of human

health. The legal basis is therefore Article 175(1) of the Treaty. The Community is seriously concerned by the continuous release of persistent organic pollutants into the environment. These chemical substances are transported across international boundaries far from their sources and they persist in the environment, bioaccumulate through the food web, and pose a risk to human health and the environment. Further measures need therefore to be taken in order to protect human health and the environment against these pollutants.

The EC and the Stockholm Convention lists these as:

- Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) contains provisions specifying how substances should be assessed with regard to their POPs characteristics.
- Under REACH, the production and use of substances exhibiting POP characteristics can be prevented and new POPs candidates can be identified.
- Regulation (EC) No 689/2008 of the European Parliament and Council of 17 June 2008 concerning the export and import of dangerous chemicals (PIC Regulation).
- This Regulation prohibits the export of 10 out of the 12 POPs substances initially listed in the Stockholm Convention.
- Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT).
- This Directive aims to completely dispose of PCBs and equipment containing PCBs as soon as possible and equipment with PCB volumes of more than 5 litres before the end of 2010. It also sets requirements for the environmentally sound disposal of PCBs
- Directive 2008/1/EC concerning integrated pollution prevention and control (IPPC Directive) The IPPC Directive lays down control measures to reduce emissions of unintentionally produced POPs by covering the major industrial stationary sources of these POPs.
- Directive 2000/76/EC on the incineration of waste (WID). The WID Directive covers all waste incineration facilities that are a very important source of POPs by-products. In particular it sets strict limits for emission rates of dioxins / furans in the air.
- ± 40 Directives or Regulations concerning the evaluation and management of the dangers/risks associated with chemical substances
  - Regulation EEC 793/93 – Existing substances
  - Dir. 67/548/EEC – New substances
  - Dir. 98/8/EC – Biocides / Plant Protection Products
  - Further Directives – E.R.A. of new pharmaceuticals

1.5. Turkish National Implementation Plan of the SC

Turkey has signed the Stockholm Convention on Persistent Organic Pollutants on May 23rd 2001 and is approved by the Turkish Grand National Assembly as 5 871 numbered Law (14.04.2009, No.27200) then published on July 30th 2009 as approved by the Council of Ministers (30.07.2009, No.27304). The Convention officially is effective since January 12th 2010.

As stated by the Article 7 of the Convention, Turkey prepared the first NIP in 2004 to 2006 funded by GEF and revised it in 2010, submitted to the Stockholm Secretariat in 2011 which included initial 12 POPs issues of concern like uses, import, export, production, distribution in country and source related inventory, current stockpiles and its disposal options assessment, contaminated sites, POPs chemicals related infrastructure, legal instruments, monitoring, research and development capacity, monitoring system establishment and use.

The updated NIP preparation was coordinated by the Ministry of Environment and Urbanization (MoEU) General Directorate of Environmental Management Department of Chemicals Management and conducted by establishing task teams by means of gathering previously identified relevant

stakeholders. The prepared plan was finalized by remarks made by the stakeholders. The conducted activities are illustrated in the plan in three main parts, Introduction containing the general information on Stockholm Convention and POPs, Stockholm Convention including the current situation of the country from the POPs point of view and the responsibilities to the Convention and finally the NIP Strategy, Activities, which includes Action plans and countrywide priorities.

Regarding the initial 12 POPs, also called the dirty dozen, the situation in the country is already determined by means of stockpiles. Moreover, the amount of unintentionally produced POPs inventory is estimated using UNEP's standardized Toolkit. In addition to those, the contaminated sites and the priorities of the countries are identified and are present in the updated NIP.

The priorities set for the country included the following list:

- Implementation and statute including regulations
- Reduction of both intentionally and unintentionally produced POPs releases
- Ongoing national inventory
- Capacity Building
- Awareness raising and training public
- Monitoring and research on public health and environment
- Information sharing and web
- Developing justified solutions and research studies in POPs susceptible societies

The prepared plan was reviewed and updated, in accordance with the responsibilities to the Convention, by funding with GEF on capacity building between the years 2012-2013. The NIP Update process is conducted via following the Guidance for Developing a National Implementation Plan for the Stockholm Convention.

The review and updating process of the NIP was in coordination of the Department of Chemicals Management, as before, and via identification and establishing task teams according to relevance.

The NIP includes the following chapters respectively (UNIDO, 2014):

- *Chapter 1* is the *Introduction* which is primarily a reading guide describing why and how the implementation plan was prepared
- *Chapter 2* describes the country baseline and characteristics. The description is introduced by a country profile briefly describing Turkey. The following section describes the institutional, political and regulatory frameworks focusing on the individual institutions and their areas of responsibility in relation with the project and POPs, as well as how the POP issues are connected to other environmental policy priorities. The subsequent sections describe other relevant international obligations and existing legislation on POPs. Compared with the 12 old substances specified in detail in the previous plan, the current plan focuses on mainly the inventory preparation of the 10 new POPs. However, the initial 12 POPs issues are addressed accordingly. In relation to the new substances, the plan briefly describes releases and the presence of POPs in the environment, food, animal feed, waste and contaminated sites to give an impression of the extent of the problems. The plan also describes the activities of monitoring POPs and research in impacts on humans and the environment, but basically the using of information from NIP 2010. Vulnerable population groups are mentioned in a short section.
- *Chapter 3* describes point-by-point *strategies, activities and action plan elements* to comply with Turkey's ratification under the Stockholm Convention. Each section includes a summary of the provisions in the Convention text applicable for the relevant area, a brief description of current issues and a description of ongoing and planned new initiatives in the area.

1.6.National Implementation Plan of the POPs management in Turkey

Although the first phase SC NIP was prepared in 2006, it was adopted by the Government only in 2010. In connection with this document, the main problem is very low level of implementation of the NIP conclusions and measures. This first NIP contains 137 action plans, but up to now only round 10 % was implemented or any activity connected with them was started.

This document was accepted as inter-ministerial, however co-ordination of activities between responsible ministries does not exist up to now. In addition, the relevant NIP measures relating to activities of responsible ministries, practically does not exist. Another problem is the efficiency and effectiveness of laws and regulations as well as inadequate and inconsistent system of the controls and inspections. Inclusion of NIP provisions into 5-yr development plans and/or yearly implementation plans of ministries is a key issue for effective implementation of the Stockholm Convention and CRLTAP/POPs Protocol provisions.

But on the other, it is fully accepted that POPs fall under the category of potentially toxic chemicals. Turkey is committed to the effective implementation of the provisions and obligations of the Stockholm Convention on POPs. This is clearly demonstrated by signing, early adaptation and finally submission of the Convention to the Turkish Parliament for ratification by the Government of Turkey. But until now, the CRLTAP/POPs Protocol was not ratified.

The Ministry of Environment and Urbanization is expected to play a leading role in promoting safe management and use of chemicals, including POPs for industrial, agricultural, public health and consumer uses in order to avoid damage to human health, the ecosystems and the environment in general to ensure sustainable development.

The process of the development of the first and updated SC NIP involved the active participation of a broad-range of relevant national stakeholders, including the Ministries, Agencies, institutions, NGOs, media. Nevertheless, many unsolved POP problems still exist and all these problems that are given in the listed National Priority Validation areas. As a Party to the Convention, Turkish Government is expected to develop actions and priorities relating to these titles. As was mentioned in the previous sub-chapter, as a part of the UNIDO Project, the draft of updated SC NIP was prepared, but this draft was not quite adequate to the considerations and approaches of the MoEU. Due to this reason, a broader document was prepared as a part of the EU project of the Technical Assistance for the Implementation of the Persistent Organic Pollutants Regulation. This document is focused on the management of POPs problems in Turkey and implementation of the Stockholm Convention on POPs, CRLTAP/POPs Protocol and EU POPs Regulation.

Based on the analysis of the state of the NIP prepared under the umbrella of the SC, level of available POPs information, inventories and approaches to the solution, a more general implementation plan was prepared. This POPs NIP cumulates the existing POPs international and regional conventions with the national legislation as well as existing and potential information concerning POPs problems in Turkey. It was prepared in agreement between the MoEU and EU Team of Project for Technical Assistance. This is focused on the implementation of the Stockholm Convention on POPs, POPs Protocol of the CRLTAP and harmonization of Turkish national legislation with adequate EU regulations and directives. The title of this document is National Implementation Plan of the POPs management if Turkey (POPs NIP) and has two parts – (i) NIP as basic information, overview of country POPs problems and (ii) supporting information presented in the Annexes of the NIP.

2. Country Profile

2.1. General Information

Turkey or Republic of Turkey in official name is a country, located in both in Europe and Asia and its capital is Ankara. Country's land is located in Anatolia peninsula and Thrace which is an extension of Balkan Peninsula. Country is surrounded from 3 sides by Mediterranean, Black Sea, Aegean Sea and Sea of Marmara which is between Black Sea and Aegean Sea. Neighboring countries are; Greece, Bulgaria, Georgia, Armenia, Azerbaijan (Republic of Nakhchivan autarchic), Iran, Iraq and Syria.

Governmental and Executive structure

Turkey is a democratic, secular, centralist and constitutional republic. Parliamentary representation democracy is implemented in Republic of Turkey. President of Republic is the president of the country and elected with the direct selections in seven year periods. Separation of powers principle is adopted. Turkey is governed by Prime Minister and Council of Ministers holding the executive power; Turkish Grand National Assembly holding the legislative prerogative and Courts holding the jurisdiction. Turkish Grand National Assembly consists of 550 parliamentarian and they are elected in 4 year-periods.

Turkey is integrated to the western world by being a member of European Council, NATO, OECD, AGIT AND G-20. Turkey is a privileged member of European Economic Community since 1963 and a member of Customs Union since 1995; started negotiating to be a full member of European Union. Also Turkey developed cultural, politic, economic and industrial contacts by joining Turkish Council, Turkish Culture and Art Collective Administration, Islam Collaboration Organization and Economic Collaboration Organization

Biggest administrative departments are provinces and there are 81 of them. A province consists of city centrum, counties and the villages appurtenant to the counties. Government assigns Governors who are in charge of administration and execution in the province. Turkey is separated to 7 Geographic Regions however; no administrative structure is represented by these regions.

The additional country information is presented in the **Annex II.**

2.2. Legal and Institutional Framework Regarding Environmental Policies

2.2.1. Turkey's Environmental Policy and Strategies

The first constitution that mentions environment is the Turkey's 1982 Constitution. The Constitution's most important article regarding environment is Article 56. According to Article 56, "Living in a balanced and healthy environment is a prerogative. Improving the environmental status, protecting environmental health and preventing environmental pollution is the duty of both the government and citizens" (1982 Anayasası, http://www.anayasa.gen.tr/1982ay.htm, 10.11.2009). Environment prerogative concept is first mentioned in Article 56 and is protected under the article.

The general framework of protection of the environment and improvement of its status is established by the Environmental Law. Environmental Law (2872) issued on August 11th 1983 based on the 1982 Constitution's Article 56, aims to establish a legal framework on protecting the environment, preventing environment from pollution or deteorisation, rehabilitation of the environment from any former pollution, improving the environmental status, using the natural resources and energy efficiently, reduction of the waste amount at the source generated as a result of an activity and recovery of the waste generated via using environmentally sound technologies, regulating and taking measures to sustain the good status of the environment to reserve its integrity for the next generations.

However, some problems arised on the implementation due to the emphasis of the Environmental Law was on environmental pollution rather than environmental management, public awareness and education on environment. Moreover, the Law could not keep up with the circumstances of the developing world and new raised issues. Therefore, an improvement had to be made in 2006. On April 26th Law on Amendments on the Environmental Law (5491) is published in the Official Gazette (26167) on May 13th 2006. The new 5491 numbered Law had many other regulation and definitions that were not addressed in the initial 2872 numbered Environmental Law. The Law focused on the key issues in protection of the environment and regulations compatible with the international agreements also makes an emphasis on adoption of a sustainable development policy.

The development plan preparation has started in 1963 and there are 10 5-year development plans that have been prepared so far. The first and the second development plan mentions environmental topics whereas the Third 5-year Development Plan for the years 1974-1978 makes an emphasis on the environmental issues in a separate chapter. The plan mentions the importance of awareness rising of the public which has started soon after the Stockholm Conference, along with the assessment of environmental issues of Turkey. However, the plan also emphasizes that the environmental policy to be adopted could not conflict with the industrial development. Beginning by the 4th Development Plan, Turkey's National Environmental Policies are in coherence and compliance with the international decisions made and responsibilities.

In our country, the first National Environmental Strategy for the years 2007-2023 the EU Integrated Environmental Harmonization Strategy (IEHS) which is consistent with the development plan has been prepared within the framework of harmonization obligations with EU. The IEHS contains detailed information on the technical and institutional infrastructure, compulsory environmental amendments and regulations that has to be addressed to implement and comply with EU environmental acquis which is a prerequisite for Turkey to join EU. To achieve this, IEHS initially stated the goals to achieve, strategy and activities planned on control of water, soil, air pollution originated from wastes and industries, protection of nature and environment which is a horizontal plane affected by any activity. In this framework, the total amount of investment (except chemical and noise) is estimated as 59 billion Euro in environment to fully comply with EU environmental standards. The 20% of the total investment is considered to be invested by the private sector and the rest is considered to be by the public sector.

2.2.2. Roles and Responsibilities

Authority concerning to environmental matters are divided between the central and local government. Ministry of Environment and Urbanization has the authority on chemicals management. Responsibilities of the MoEU are:

- to coordinate policies and strategies regarding prevention of environmental pollution, developing standards and benchmarks, preparing programmes to create pollution maps, education, research, planning and action plans,
- to determine and monitor the implementation principles and to organize the work and process on climate change
- to determine and assess the environmental impacts of facilities or activities that has or may have solid, liquid and gaseous waste discharges to receiving bodies; to monitor the receiving

bodies; to monitor, permit and audit such facilities or activities and to provide control of the noise release from relevant activities.

Responsibilities of other institutions that have a role in the preparation of the NIP and POPs NIP are described in **Table 3:**

Table 3: Responsibilities of institutions that have a role in the preparation of the NIP and POPs NIP

Institution	Responsibility
Ministry of Environment and Urbanization	Main account institution. To draft legislation on POPs. To perform, monitor and coordinate activities of POPs as competent authority.
Ministry of Forestry and Water Affairs	To coordinate and control the national water resources management (deriving the quality standards for POPs in water and monitoring and control of pollution caused by POPs in water resources) and to create policies for protecting water resources for sustainable use of water
Ministry of Science Industry and Technology	To determine industrial strategies and aims by constituting industrial committees and monitor the studies on these subjects, and control the production of chemicals.
Ministry of Economy	Ensuring top legislative harmonization between the product safety, technical regulations, technical obstacles, technical suitability assessment and monitoring of the applications and adapting the technical legislations related to the products working in coordination with relevant institutions to the foreign trade. Determining the regulatory principles of product safety, import and export of chemicals
Ministry of Energy and Natural Resources	Supervision of the chemical waste and the equipments used in distribution and production of electricity and taking relevant precautions on the subject.
Ministry of Food Agriculture and Livestock	Control, regulate and monitor the licensing, production, import, export, sales, use, storage and old stocks of agricultural chemicals.
Ministry of Customs and Trade	Taking consumer precautions on consumer goods that pose or may pose a hazard to the environment, preparing quality control and quality checking systems to raise the quality of food, making suggestions to the related foundations pursuant to the standards. Control of the chemicals that are coming in and going out of the country and making sure the relevant legislations are followed while import and export of the chemicals.
Ministry of Development	Development and public investment policies' determination regarding chemicals and environment and its coordination during implementation.
Ministry of Health	Development of sectoral health policies, implementation of national health strategies, investigation of the effects of chemicals on human health after short and long term exposure
Ministry of Labour and Social Security	Monitoring of occupational health and safety issues, auditing, policy development and planning, developing health and safety units and certifying the practices. Determining the rules and principles of working with chemicals and the measures necessary for the prevention of industrial accidents.
Ministry of Transportation, Maritime Affairs and Communications	Controlling the transport of the chemicals
Ministry of National Education	Conducting public awareness and education activities

2.2.3. Agreements/Conventions Related With POPs

Stockholm Convention on POPs

Turkey has signed the Stockholm Convention on Persistent Organic Pollutants on May 23rd 2001 and is approved by the Turkish Grand National Assembly as 5871 numbered Law (14.04.2009, No.27200) then published on July 30th 2009 as approved by the Council of Ministers (30.07.2009, No.27304). The Convention officially is effective since January 12th 2010.

Basel Convention on Transboundary Movement and Disposal of Hazardous Waste

International studies to take measures while management, disposal and transport of the wastes originated from various industries that could pose a risk on public health and environment are conducted. UNEP took the initiative and prepared the Basel Convention which is effective since May 5th 1992 in Turkey and became a Party to the Convention on June 22th 1996. Since then Turkey export wastes in accordance with the convention.

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

On September 10th 1998 Turkey has signed the Rotterdam Convention in PIC Convention Diplomatic Conference which was prepared by both UNEP and UN Food and Agriculture Organization (FAO). The Convention is effective since February 24th 2004. MoEU has started the process of becoming a Party to the Convention, as the finalized Turkish translation of the Convention text is submitted to the Ministry of Foreign Affairs in 2009 after opinions from relevant ministries are obtained. Draft Law on Approval of Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is sent to Turkish Grand National Assembly in July 2010. The draft law has passed through the Turkish Grand National Assembly Environmental Commission on November 26th 2011. The Convention is in the process of approval by the General Assembly since 2012.

Convention on Long-Range Transboundary Air Pollution (CLRTAP)

The Convention on Long-Range Transboundary Air Pollution is approved by the 2667 numbered Law on April 28th 1982 and published on March 23rd 1983 Official Gazette. Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) is approved on June 3rd 1985 and published in the Official Gazette on July 23rd 1985. The protocol is effective internationally from January 28th 1988.

Under CLRTAP and EMEP Protocol:

Total emission of 4 parameters (SO_2, NO_x, NMVOC, NH_3) should be reported to UN, European Environment Agency, European Economic Commission Secretariat and EMEP.
There are 8 protocols under the LRTAP Convention:

- Protocol to Abate Acidification, Eutrophication and Reduction of Ground-level Ozone
- Protocol on Persistent Organic Pollutants (POPs)
- Protocol on Heavy Metals
- Protocol on Further Reduction of Sulphur Emissions
- Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes
- Protocol concerning the Control of Nitrogen Oxides or their Transboundary Fluxes
- Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes
- Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent

Framework Convention on Climate Change

Turkey has been aware of the environmental and socio-economic consequences of climate change which is a complicated and multilateral issue posing threats not only but also to future generations that should be addressed accordingly. Therefore, Turkey has took the initiative to reduce the greenhouse gases (GHGs) and made international collaborations. At the 7th COP of UNFCCC held in Marrakech by the 26/CP.7 decision Turkey has listed as an Annex 1 country and the Parties has invited Turkey to acknowledge the special conditions which is different from the rest of the Annex 1 countries. After this decision, Turkey has become a Party on May 24th 2004 and on August 26th Turkey has become a Party to the Kyoto Protocol. Even Turkey has no obligation to reduce the emissions, has addressed the

issues like energy efficiency, renewable energy resource use encouragement, reduction of emissions originating from waste and transport sectors. Moreover, Turkey is still working eagerly on the dissemination of voluntary emission market and integration of mandatory emission market.

Montreal Protocol on Ozone Depleting Substances (ODS)

Turkey ratified and became a Party to the Vienna Convention for Protection of Ozone layer and Montreal Protocol on Ozone Depleting Substances (ODS) in 1991.

MoEU is the focal point for the Protocol and fulfils the duties and responsibilities such as following the national and international studies on the subject. Turkey is considered to be one of the successful countries on implementing the Montreal Protocol.

In June 1990, a 'Multilateral Fund' is established in London with the contribution of developed countries which is considered to be a huge success of the Protocol. This fund is used for the provision of technical assistance, introduction of new technologies and equipments that help reduction of ODS use in industries of developing countries.

Under the provisions stated in Regulation on ODS Reduction and Memorandum on Import and Use of ODS:

- Chlorofluorocarbon use is reduced to zero tonnes by the year 2006,
- Halon import is eliminated by the years 2008,
- Methyl Bromide use except for quarantine purposes which is regulated by the MoFAL is eliminated by the year 2008.

Hydrochlorofluorocarbon (HCFC) gases which are the alternatives for the CFCs are tried to be phased out following a calendar. Its use is eliminated by the beginning of 2013 in foam sector and its import is going to be eliminated 2015 in refrigeration except for service purposes.

Moreover, the ODS in country (from import to use) is monitored beginning from 2009 under the Programme of ODS Tracking.

2.2.4. Legal Framework on POPs

As a Party to the Stockholm Convention, there are a number regulations and legislations adopted and implemented on POPs in order to comply with the convention's liabilities. The list of the regulations and its related statements are demonstrated in **Annex III.**

The responsibilities' of Turkey with respect to legal framework to the Convention is demonstrated in **Table AIII/2**. This Table represents the compliance of Turkish Legal Framework with Stockholm Convention's legal and institutional liabilities of Parties. This comparison also is a key issue that should be addressed in the NIP.

2.3. Inventory of POPs – status in Turkey (UNIDO, 2014)

2.3.1. Agricultural and industrial chemicals (Annexes A and I of the Conventions)

2.3.1.1. Pesticides and HCB

Annex A chemicals except mirex, chlordecone, alpha hexachlorocyclohexane, beta hexachlorocyclohexane, lindane, pentachlorobenzene are licensed for a period of time in Turkey. The use, production, import and export ceased after discovering the toxic effects on environment and public health. Licensing and decertification process is carried out by Ministry of Food, Agriculture and Livestock.

An HCH stock in Turkey is located in Derince which is a county in Kocaeli close to Sirintepe ground. There is no record in MoFAL that these chemicals had been produced for agricultural purposes. HCH is stored in Merkim Industrial Products Inc., Warehouses in 50 kg plastic bags and barrels in white powder form. The estimated amount of chemicals stored there is around 3 000 t. This material was produced by Plant Protecting Chemicals Inc. for industrial purposes. HCH was prohibited in 1985 by Law on Agricultural Pest Control and Agricultural Quarantine because of its hazardous effects on plants and human health. The last pesticide stock left in Turkey is planned to be disposed until 2017 as a component of "Elimination of POPs Stocks and Reducing Releases Project" financed by GEF.

Overview of POPs pesticide situation in Turkey from the point of view of production, application, licensing is summarized in **Table 4.**

Table 4: POPs Pesticide Situation in Turkey

Pesticide	Licence situation in Turkey	Cause and date of ban in Turkey
Aldrin	Licensed	Banned in 1979 because of the negative impacts (carcinogenic) on human health and environment
Chlordane	Licensed	Banned in 1979 because of its toxic effects on human health and environment.
DDT	Licensed	Its use is restricted on 1978, and banned on 1985 because of the toxic and carcinogenic effects on humans and environment by accumulating on fatty tissues of organisms
Dieldrin	Licensed	Banned on 1971 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
Heptachlor	Licensed	Banned on1979 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
Endrin	Licensed	Banned on1979 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
Toxaphene	Licensed	Banned on1989 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
Mirex	Never used in Turkey since it has never been licensed	
Lindane	Licensed	Banned on 1985 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
α- Hexachlorocyclohexane	Licensed	Restricted on 1978 and banned on1985 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
β- Hexachlorocyclohexane	Licensed	Restricted on 1978 and banned on1985 because of its lethal effects (carcinogen) on humans and living organisms and toxic effects on environment.
Endosulfan	Licensed	It was banned on 2009 (according to the information given by the Ministry of Food Agriculture and Livestock)

2.3.1.2. Hexabromobiphenyl (HBB)

Like many countries in the world HBB is not used for a long while since it has been banned for a long time and has many alternatives.

2.3.1.3. Polychlorinated biphenyls (PCBs)

This section includes updated data on the presence of PCBs as a result of historical intentional use in Turkey. PCBs were marketed globally for closed applications (e.g. capacitors, transformers, electric motors), semi-closed applications (e.g. hydraulic systems, heat exchangers) and open applications (e.g. lubricants, plasticizers, inks, adhesives, flame-retardants). In this context, PCBs were never produced in Turkey but imported either within equipment or as in the oil form for those applications. Considering the production history of PCBs together with the demands of energy generation/transmission and high energy consuming industries, PCB use is estimated to start around the 1960s, which leads to an approximately fifty year history for intentional use of PCBs in Turkey. There is no official import/export record during the years 1969-1996 in which PCBs were imported under "other type of oils used in the chemical industry". The first limitation on the use of PCBs was initiated with the By-Law for the Control of Harmful Chemicals and Products in 1993. The use of PCBs was limited to specific applications only, such as transformers, condensers, and as hydraulic fluids, among others, until 1996 (Gedik and Imamoglu, 2010).

The first preliminary inventory of PCBs was made in 2007 (NIP, 2010). An overview of historical data together with theoretical calculations was compiled from a limited field test and survey for PCBs especially used in energy generation/transmission industries. The most recent inventory based on the similar methodology was updated in 2012-2013 and its results are presented in **Table AIV/1.** This PCB inventory study is mainly focused on closed applications of PCBs as insulating fluids in transformers and capacitors. Inventory studies on semi-closed and open application have not been conducted, yet. Among the prioritized sectors 140 of 175 facilities replied the questionnaires sent by official letters. The data of a total of 1 080 tonnes of pure PCBs containing materials and equipment was reached from the answers of the surveys listing PCB-laden equipment with other equipment and site visits made in September 2013. Many items of PCBs by use category including semi closed/open applications (e.g. hydraulic, lubricant, plastic, sealant, printing ink) have the potential to contain small amounts of PCBs. However, in the near future, the national PCB inventory will be updated especially for such applications as information is received from PCB owners. As a part of the UNEP/MAP project, a detailed site investigation is done and new information concerning to the amounts of PCB containing oils in storage bins, are available.

2.3.1.4. PDBEs

In May 2009, tetrabromodiphenyl ether, pentabromodiphenyl ether (components of commercial pentabromodiphenyl ether, c-pentaBDE) hexabromodiphenyl ether and heptabromodiphenyl ether (components of commercial octanbromodiphenyl ether, c-octaBDE) were included in the Stockholm Convention which prohibits production, use, import and export.

Since the twentieth century, manufacturers began to replace traditional materials such as wood, metal, and wool with petroleum-derived products such as plastics and polyurethane foam. These new “treated” materials are either less flammable or slowed down the rate of fire growth. The latter is achieved by treating the materials by flame retardants, mainly brominated (BFRs). Polybrominated diphenylethers (PBDEs) are one from the mostly frequently used group of brominated chemicals used as flame retardants and hence widely used in items that are susceptible to catch or sustain fire such as plastic in electronic devices, polymers in automobile, certain synthetic textiles and polyurethane foam in certain applications.

The PBDE inventory was created on the basis of tier 1 and tier 2 of the tiered approach provided by the guidance document (Stockholm Convention Secretariat, 2012a). Tier 1 is the initial assessment that generally relied on inventory studies while tier 2 reports the preliminary assessment based on calculations. The methodologies employed by the PBDE inventory task team include indicative, qualitative, and quantitative methods (Stockholm Convention Secretariat, 2012a).

In order to obtain more accurate estimation on the amount of PBDEs present in the country, data from the Turkish Statistics Institution (TURKSTAT) on population, number of registered vehicles and number of manufactured vehicles data from relevant associations/unions, import/export data from Ministry of Customs and Trade and estimation methods such as geometric increase method were used.

At the first stage of preparation of the inventory the targets are set for developing the activities and a work plan schedule is prepared to accomplish the activities one step at a time. For this purpose, the inventory is limited to major uses of POP-PBDEs indicated in the guidance document. According to the guidance document (Stockholm Convention Secretariat, 2012a), the main use of c-OctaBDE was in acrylonitrile-butadiene-styrene (ABS) polymers, accounting for about 95% of c-OctaBDE supplied in the EU. The treated ABS was mainly used for housings/casings of EEE, particularly for cathode ray tube (CRT) housings and office equipment such as copying machines and business printers. On the other hand, it is considered that between 90% and 95% of the use of c-PentaBDE was for the treatment of polyurethane (PUR) foam. These foams were mainly used in automotive and upholstery applications. Furthermore, other uses of PBDE are considered of minor relevance (Stockholm Convention Secretariat, 2012a) and are excluded in this preliminary inventory.

For c-PentaBDE, the amount of end-of-life vehicles was estimated using the average life span of vehicles, and data on the number of registered vehicles. For c-OctaBDE, the amount of e-waste recycled and landfilled was calculated using the End-of-Life Model (Peralta and Fontanos, 2006).

The inventory of the POP-PBDEs in transport sector consists of following life cycle stages:

- Vehicles imported/exported in the inventory year. Possibly import data of previous years as a basis for estimating/evaluating stocks
- Stocks of vehicles (vehicles in use/possession of consumer/corporates)
- End-of-life vehicles entering the waste stream
- Polymers from end-of-life vehicles recycled
- Polymers of end-of-life vehicles disposed in the past

POP-PBDEs in the Transport Sector

The evaluation of available and relevant national data on the transport sector was conducted by using the approach of the *PBDE Inventory Guidance* (Stockholm Convention Secretariat, 2012a) with the available data identified and by estimating the data to fill data gaps. Calculations were made for cars, buses, vans/trucks and mini/midibuses for Turkey.

Factors needed for POP-PBDE calculation for vehicles were:

- the amount of vehicles for the different sectors (cars, buses and trucks)
- the amount of vehicles in the different life cycle stages (import, use, end-of-life)
- the origins of manufacturers of vehicles
- impact factors for the different vehicle types.

The estimated contents of POP-PBDE in respective vehicle type are given by the POP-PBDE Inventory Guidance (Stockholm Convention Secretariat, 2012a). However one different approach was taken by Turkish inventory team - The Inventory Guidance suggests an amount of 1 000 g PentaBDE for a bus (with average 33 seats). For Turkey, however, there is a considerable amount of mini/midibuses operating within the country. As country specific

impact factor 500 g c-PentaBDE (corresponding to 50% of PUR foam of a bus) was selected for this vehicle category.

Cars, buses, mini/midi buses, vans/trucks are the major portion of the transport sector containing the largest volume of POP-PBDEs. The focus and methodology for the initial assessment are therefore centered on these vehicles. Some of these vehicles are imported whereas some of them are produced within the country. A large proportion of c-PentaBDE use has been within the transport sector; the major use was for treatment of flexible polyurethane (PUR) foams (automotive seating, head rests, car ceilings, acoustic management systems, etc.) and a minor use was in back-coating of textiles used on car seats.

c-OctaBDE has also been used in plastics vehicle parts (steering wheels, dashboards, door panels, etc.). Only a portion of the cars produced between 1975 and 2005 worldwide have been treated with c-PentaBDE. It is estimated that about 35% of the approximately 100 000 tonnes c-PentaBDE production has been used in the transport sector (Alcock et al. 2003, UNEP, 2010a, 2010b). Thus, the transport sector is one of the large material flows of goods and ultimately becomes a large waste and recycling flow. Moreover, the end-of-life management of the transport sector is a highly relevant material flow for the recovery of materials and for managing pollutants (Vermeulen et al., 2011).

For the Stockholm Convention, the listed POP-PBDE homologues: tetraBDE, pentaBDE, hexaBDE and hepaBDE need to be finally considered and not the total amount of c-PentaBDE or c-OctaBDE. These homologues were calculated from the estimated amount of c-PentaBDE (or c-OctaBDE) by considering the percentages of homologues in the commercial mixtures given in **Table AIV/2.**

POP-PBDEs generated from the transport sector, is demonstrated in summary in **Table AIV/2.** The estimated amount of PBDE homolog congeners distribution using the factors illustrated in the the Stockholm Convention Guidance are; 32% tetraBDE, 56% pentaBDE, 9% hexaBDE and 0.5% heptaBDE. According to the calculations made the amount of pentaBDE in the vehicles by the year 2012 59 012 kg which consists of 19 tonnes of tetraBDE, 33 tonnes of pentaBDE, 5 ton of hexaBDE and 0.3 tonnes of heptaBDE. Moreover, the amount of PBDEs from imported vehicles to the country is estimated as 40 956 kg. The largest amount of PBDEs is detected to be originated from End-of-Life Vehicles and is estimated as 303 118 kg containing approximately, 97 ton of tetraBDE, 170 tonnes of pentaBDE, 27 tonnes of hexaBDE and 1.5 ton of heptaBDE. The total PBDE amount released from the transport sector is estimated as 200 tonnes and the total PBDE amount released from recycled PUR foams is estimated as 22 tonnes.

Inventory of Electrical and Electronic Equipment Containing PBDEs

EEEs are the largest material flows containing c-OctaBDE (Stockholm Convention Secretariat, 2012a).

In Turkey, the import of electrical and electronic equipment (EEE) from industrial countries increased during the last ten years. According to Ministry of Development (MoD) there were approx. 30 million TVs in Turkey in 2000. For the same year, 6.7 million appliances were entered to the market in Turkey and 4.3 million of them were imported. Import of WEEE or second hand electronics is banned by law in Turkey however, licenced companies are permitted to import rubber, glass and plastic waste (Communiqué on Import Controls of waste for protection of Environment (Product Safety and Inpection: 2013/3)). Therefore, any WEEE in this inventory is considered as new.

The first computer in Turkey_was utilized at General Directorate of National Highways in 1960. Personal computers became widespread in Turkey after 1984 (BT Sektörü, accessed in October 2013). According to Revenue Administration Department of Turkey, lifespan of a personal computer in Turkey is approx. 4 years (Gelir İdaresi Başkanlığı, accessed in October, 2013). Additionally, a stockpile period of 1 year was assumed for imported computers. Therefore, the current inventory covers CRT computers from 1984 to 2009 assuming that some of the PCs imported in a particular year

will be stored for 1 year and will be used for another 4 years and will reach its end of life in 5 years after imported. Turkey does not have any computer manufacturing facilities; however, assembling of computers which are imported as parts is present. However, in this inventory, it is assumed that all computers are imported to the country as assembled. Furthermore, it is assumed that all of the imported PCs were CRT casing computers between 1984 and 2005.

According to Peralta and Fontanos (2006), the average lifespan of televisions is 8 years the amount of c-octaPBDEs in CRT monitors and TVs is estimated as 391 tonnes which consists of 43 tonnes of hexaBDE, 168 tonnes of heptaBDE and 137 tonnes of octaBDE. The c-octaBDE amount in stockpiles is estimated as 168 tonnes containing 18 tonnes of hexaBDE, 72 tonnes of heptaBDE and 59 tonnes of octaBDE. Also the amount of c-octaBDEs in the CRT monitors that entered the waste stream is calculated as 43 tonnes, c-octaBDEs in CRT monitors recycled is calculated as 80 tonnes (**Table AIV/3**).

Direct Import of Diphenyl Ether, Tetra- And Pentabromodiphenyl Ether

On the basis of data obtained from Customs Office of Turkey, 547 tonnes of diphenyl ether and 177 tonnes of penta/tetra bromo diphenyl ether were imported to the country, respectively between 1996 and 2013. However, there is no information statistics on the use/application areas of these chemicals in the country and these chemicals are not included in the inventory study.

Imported Acrylonitrile-Butadiene-Styrene

The main former use of c-OctaBDE was in acrylonitrile-butadiene-styrene (ABS) polymers, accounting for about 95% of c-OctaBDE supplied in the EU. The treated ABS was mainly used for housings/casings of electrical and electronic equipment (EEE), particularly for cathode ray tube (CRT) housings and office equipment such as copying machines and business printers. Typical concentrations in the major applications were between 12 wt % and 18 wt %, with approximately 100 000 tonnes of c-OctaBDE at an application rate of 15 wt %. Assuming ABS imported to Turkey contains 15 wt% c-OctaBDE, POP PBDE in imported ABS to Turkey between 1970 – 2004, is about 997 684 tonnes (**Table AIV/4**). According to TURKSTAT database, number of dwellings in Turkey in 2012 was 19 842 850 which results an approx. amount of 50 kg of ABS per dwelling or 13 kg ABS per person (based on 2013 population of the country).

2.3.1.5 Hexabromocyclododecane (HBCD, HBCDD)

1,2,5,6,9,10-Hexabromocylcododecane (HBCDD) is defined as a novel flame retardant and it has been increasingly used as a substitute for other brominated flame retardants such as polybrominated diphenyl ethers (PBDEs). The world production has increased from 16 000 tonnes in 2000 to 23 000 tonnes in 2008, and the most of this increase has occurred in China (Annex XII). Approx. 80% of HBCDD produced is estimated to be used as a flame retardant in expanded polystyrene (EPS) and extruded polystyrene (XPS) insulation products for buildings and construction (EU, 2008). Transport of compounded polystyrene (PS) with HBCDD (granules, masterbatch or beads) over long distances cannot be excluded, but information on this is totally lacking.

EPS is available with or without HBCDD and if HBCDD is used, it constitutes approx. 0.5% (0.5-0.7 % HBCDD w/w) of the final product by weight (Annex XII). EPS is usually provided at a density of 15.9-32.1 kg per cubic meter.

HBCDD-containing EPS is mainly used for the following purposes:

- insulation panels/boards in the construction sector
- automobile cushions for children (KemI, 1994) to meet the needs of the standards
- rigid packaging material for fragile equipment (minor use)

- packaging material such as “chips” and shaped EPS-boards (minor use)
- in props for theatre and film, and in exhibitions (minor use)

XPS is supplied in densities from 29 to 32,1 kg per cubic meter and it is used primarily for roofing and various architectural molding applications in the building and construction industry (with HBCDD content from 0.8 to 2% w/w.

HBCDD-containing XPS is mainly used for the following purposes:

- Cold bridge insulation
- Sandwich Panels and Laminates
- Cavity Insulation
- Floors
- Basement Walls and Foundations
- Inverted Roofs
- Ceilings

Another but a minor application area of HBCDD is in high impact polystyrene (HIPS) (1-7 % HBCDD w/w) in electrical or electronic parts of customer products. It can also be found in polymer-dispersion coating agents used in textiles (10-15% HBCDD w/w) for upholstered fabric, furniture, mattress ticking and for seating in vehicles (Annex XII). The textiles with the back-coating containing HBCDD are mainly used for:

- flat and pile upholstered furniture (residential and commercial furniture)
- upholstery seating in transportation
- draperies, and wall coverings
- bed mattress ticking
- interior textiles e.g. roller blinds
- automobile interior textiles and car cushions.

HBCDD is added to products at certain rates, it is not chemically bound. Therefore, it is more likely to dislodge from the product that it is applied in over time during use or after the product is disposed (Annex XII). There is also evidence that HBCDD may be replacing some polybrominated diphenyl ether (PBDE) flame retardants, notably the commercial decabromodiphenyl ether formulation (POPRC 2011). In Western Europe approximately 70% of EPS used for construction applications is flame-retarded, whereas more than 99% of flame-retarded EPS is used in Eastern Europe (Annex XII).

High impact polystyrene (HIPS) containing HBCDD is likely to be imported to Turkey in electrical and electronic equipment, but no data on this has been gathered. Import of polymer dispersions for textiles containing HBCDD cannot be excluded. Textile that is back-coated with a HBCDD containing layer is imported from China, the US and other countries in unknown quantities. In summary, import (and export) of HBCDD in articles is likely to occur but has not been possible to quantify.

There are four types of commercial HBCDD mixtures produced and each has different melting points. All mixtures contain the isomers α-, β- and γ-HBCDD (Annex XII). Trade names/product names of HBCDD are Saytex HP-900, FR-1206 and CD-75P.

HBCDD Inventory

To our best knowledge, HBCDD is not produced in Turkey and yet there is not a defined Harmonized System code (HS Code, GTIB code) in Importers’ Search Engine Trade Atlas (http://www.tradeatlas.com/page/gtip-nedir-gtip-no-sorgulama-gtip-no-ogrenme?ID=gtip-nedir), thus it is assumed that it has not been imported in its pure form to the country. However, it might be imported under the following GTIB number(s) which cover more general chemical group(s) 290359, 29369, 290399, 293190, 294200

Current inventory covers only EPS and XPS products and excludes textile and HIPS products. Production of EPS or XPS in Turkey is not enough to meet the demand of the market, therefore, EPS and XPS is exported at higher amounts to meet this demand. Some of domestic product is exported to various countries including Greece, Bulgaria, Russia, Lebanon, Jordan, Israel, Spain, Italy and US. IZODER is a non-profit union holding membership of 90% of companies who produces heat, water, sound and fire insulation products. Based on database of IZODER (www.izoder.org.tr), number of companies that produces fire insulation products is 15. However, it is not stated in detail whether these companies uses HBCDD in their products or not.

In 2005, approx. 1.4 million cubic meter EPS and 750000 cubic meter XPS were sold in Turkey (Annex XII). Based on 2010 data, size of insulation products market in Turkey was 3.5 million cubic meter whereas amount of insulation products used per capita in the country is 0.05 cubic meter. Figure 13 show changes in heat insulation sector in Turkey between 2004-2009.

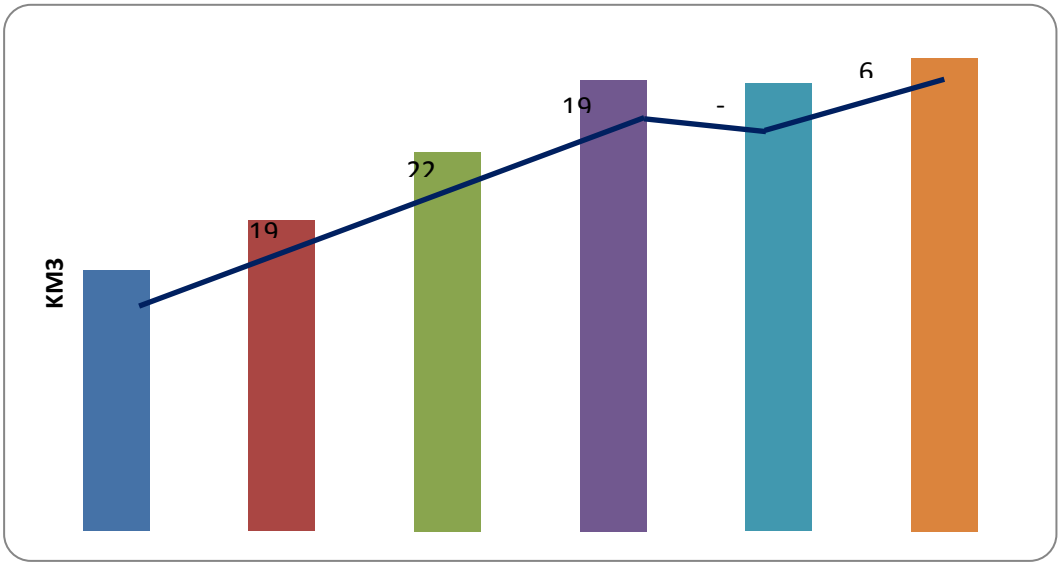

Figure XX. Heat Insulation Market in Turkey (Hacıbebekoglu et al., 2011)

Based on the detailed inventpry úresented in Annex XII, 16 000 tonnes of HBCDD is present in insulation products that are in use/disposed products in Turkey. However, this number is higher than it should be noted that insulation materials should be tested to determine % HBCDD content of materials.

According to a survey conducted by VECAP (2009, Annex XII), an emission of 6 g, 7 g and 22 g of HBCDD from per tonne sold HBCDD product is released to air, water and to the land, respectively (Annex XII). Moving from this point, it can be calculated that of the 16 000 tonnes of HBCDD present in insulation products in Turkey, there will be released 96 kg, 112 kg and 352 kg HBCDD to air, water and to the land, respectively.

There is no measurements/monitoring study results regarding HBCDD in Turkish environmental compartments. The only study was a short-term arir/dust monitoring project carried out by Dr. Kurt-Karakus in 2012 in Istanbul. Obtained results from that study showed ambient air concentration of HBCDD in Istanbul ranged between 38 - 1 200 pg m^{-3} whereas indoor air concentrations ranged between <MDL - 400 pg m^{-3} in homes and <MDL – 2 4000 pg m^{-3} in offices. Indoor dust concentrations ranged between <MDL – 29 000 ng g^{-1} in homes and <MDL to 94 000 ng g^{-1} in offices (Kurt-Karakus, 2013, Annex XII). In general, levels in Istanbul are lower than HBCD levels reported for data reported from UK or Canada (Annex XII).

2.3.1.6 Conclusions

Additional part of BFRs inventory, confirmed that although studies on POP-PBDEs and HBCDD in Turkish environmental compartments are very limited and not much is done to determine amount of these chemicals in Turkey, based on evaluation of scientific studies and available information from other regions as well as growing international evidence on bioaccumulation, persistence and toxicity of PBDEs, Turkish government is willing to take any kind of measures to reduce risks of BFRs to Turkish people. But still this inventory was a pioneer study to evaluate PBDEs and HBCDD in Turkey and due to limited time and financial sources, the borderline of the current inventory study has some limitation. For example no measurements of PBDE content of consumer products and waste and recycling flows have been performed. Also no surveys to determine EEE consumer products penetration rates have been conducted. The full version of this additional inventory is presented in the Annex XII.

Problems of the BFRs are not connected with the environmental contamination only, but much more with indoor environment, working environment and waste management with a special attention to the e-waste recycling. These problems need the legal base for the protection of environment and worker and citizen protection, but without specific provisions for example for HBCDD. It is a necessary to add HBCDD to the list of chemicals which present or may present an unreasonable risk of injury to health or the environment. Government should propose a ban on the use of HBCDD and other flame retardant substances in consumer products.

The proposed strategies for limiting the HBCDD risks for the environment and humans exposed via the environment are

- to impose restrictions on the marketing and use of HBCDD in general, i.e. in textiles, HIPS, EPS and XPS
- to consider the need for time limited exemptions for certain uses of HBCDD in EPS and XPS
- to classify used material and products containing HBCDD as hazardous waste under the hazardous waste directive
- to include HBCDD as a priority hazardous substance in Water Pollution Control Legislation
- elimination/limitation of uncontrolled landfilling/dumping

2.3.1.7 Other and newly listed and candidate POPs

Information concerning to newly listed or candidate POPs (hexabromocyclododecane, decabromodiphenyl ether, pentachlorophenol, trifluralin, dicofol, hexachlorobutadiene, polychlorinated naphthalenes) are not available.

2.3.2 Agricultural and industrial chemicals (Annexes B and II of the Conventions)

2.3.2.1 DDT

DDT was widely used during World War II to protect soldiers and civil people from malaria, typhus and other diseases that are carried by vectors. In the post war era DDT use on agricultural products and vector combat continued. Because of the belief of its harmful effects on nature, especially on wild birds, most of the developed countries banned DDT in the beginning of 1970´s.

DDT use in Turkey is restricted in 1978, banned completely in 1985. The last stockpile 10 930 tonnes of DDT was sent to IZAYDAS Inc. located in Kocaeli province to be disposed funded by general budget.

2.3.2.2 PFOS

PFOS is produced synthetically from PFOSF, and PFOS can be derived from its salts when dissolved. The term "PFOS-related substances" is used for all substances that contain one or more PFOS groups (defined as $C_8F_{17}SO_2$) and that can, or are assumed to, be degraded to PFOS in the environment. These PFOS-related substances are restricted through the listing of PFOSF, the basic material for their manufacture, and the listing of PFOS in Stockholm Convention (Stockholm Convention Secretariat, 2012d).

PFOS and PFOS-related substances are known with their high surface activeness and they have been added to Stockholm Convention Annex B because they meet the POP criteria of the Convention. PFOS and PFOS-related substances have an extensive usage area which is limited by the Convention, permits to intended purposes and special exemptions (Stockholm Convention Secretariat, 2012d).

The Turkish NIP was prepared before PFOS is listed under the Convention therefore; there is no available data on PFOS in the initial NIP. For this reason, this NIP has the feature of being the first one to contain PFOS and related substances inventory.

The study done in inventory of PFOS and related substances, help solve the gaps in the implementation process, determine the actions and strategies for future implementation and strengthen the inter-institutional cooperation.

In order to deliver an accurate inventory not only different but also additive methodologies are used. These methodologies are listed as follows:

- Determination of the PFOS using sectors
    - (metal plating, textile manufacturers and retailers, synthetic carpets, pulp and paper, semi-conductor, electronic and photographic, chemical industries and product supplier, retailers of commercial products, firefighting foam manufacturers and customers)
- Determination of the roles and responsibilities of stakeholders
    - (Ministries, Chambers, Associations, Foundations, Manufacturers, Unions, etc.)
- Preparation of the questionnaires according to the Guidance on Conducting PFOS Inventory (Stockholm Convention Secretariat, 2012c, d), distribution of the questionnaires to the stakeholders and direct contact with the stakeholders when necessary
    - (Phone calls, e-mails, etc.)
- Skimming the country database on chemicals
    - (Customs and Trade Database on the basis of HS codes, Chemicals database on the basis of CAS no)
- Examination of applications in other countries,
    - (PFOS HS Codes determined in other countries to monitor the customs when import/export of PFOS containing chemicals or articles (METIJ, 2011), vb.)
- Scanning national sector and sectorial reports,
    - (Textile, ready-made clothing, leather, carpet, paper, cardboard sectorial reports, financial reports, press statements, press declarations, etc. (MSITT, 2012; MET, 2012; MSITT, 2013; PPIF, 2011))
- Scenario preparation when it is not known whether the article contain PFOS or not,
    - (When the amount of PFOS in metal plating, textile, synthetic carpets, paper, cardboard and hydraulic fluids cannot be determined than scenarios are used to estimate the amount of PFOS)

PFOS and its related substances

According to the information gathered from e-mails and phone calls made with the importers of PFOS which is determined by the Prior Consent that has been sent by the EU Countries that are exporting the chemical to Turkey under the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade there is no PFOS production in the country whereas PFOS coming into the country via import. Moreover, the HS codes used when importing are determined with the phone calls made with the exporting companies. Using these HS codes the data on import of the chemical is obtained from the Ministry of Customs and Trade database (**Table AIV/5**).

The average amount of PFOS used in the country can be estimated as 850 tonnes if it is assumed that all the chemicals imported to the country under the 2923.90.00.90.19 HS Code. However, the exact amount of PFOS imported under the 2923.90.00.90.19 HS Code is not known. According to in Table AIV/5 it can be seen that there is a decrease between the years 2008 to 2011 whereas a significant increase could be observed for the year 2012.

PFOS Containing Products, Goods and Articles

The HS codes for articles that may contain PFOS is determined and the retrieved amounts of articles contain PFOS from the MoCT database is listed in **Table AIV/6**.

The amount of PFOS retained in the country on the article basis for the years 2011 is estimated as 120 000 tonnes from the import and export data by using HS codes.

Considering the uncertainties priority sectors:

- metal plating
- hydraulic fluids
- textile synthetic carpets
- paper and cardboard

sectorial reports are examined to determine the production, import and export amounts. The related results can be seen in **Tables AIV/7** and **AIV/8**. As demonstrated in **Table AIV/8** the largest amount PFOS use is in metal plating. In metal plating PFOS use is generally in chromium, copper and nickel plating, nevertheless chromium and nickel plating are not accounted in the inventory.

Conclusions

Based on the above mentioned inventory and additional one (see Annex XII), the basic outcome is that PFOS is neither produced within the country nor used as a process chemical. However there are ongoing uses of PFOS containing substances such as hydraulic fluids for aviation and aqueous fire fighting foams. In addition to this, historical uses of PFOS in different articles still have an effect on the local releases.

PFOS related substances are used by hard chrome plating industries as mist suppressant. Although actual trade statistics is needed for further research, it is assumed that the mist suppressing agent is imported to the country for chromium plating purposes. Metal plating industries, release PFOS containing wastewater emissions which in return end up in water and soil media. Air emission from this sector is negligible.

The contribution to electronics, semiconductors sectors, and rubber and plastics products is negligible compared to other contributing industries. On the other hand gold and copper mining industry, similar to chemically driven oil and gas industries also do not use PFOS related substances in their processes any more. Despite the data gap on historical use of PFOS related substances for these sectors, it is

assumed that if PFOS were used in previous years, then these sites are potential contaminated sites of PFOS.

Ongoing use of PFOS containing AFFFs is a major issue for the investigation and past uses are indications of already contaminated lands with PFOS. In fact, there is an ongoing release to water and soil media from this sector. In addition to this, wastage of out-of date products constitute an input to PFOS containing wastes with the historically out-dated products.

The majority of the solid waste containing PFOS in Turkey is disposed of to municipal solid waste landfills/wild deposition sites. But it is not known to what extent the substances are destroyed. No data were available on the destruction efficiency under the actual conditions in the incinerators/landfill operations. More studies are needed to clarify whether it would be necessary to dispose of PFOS-containing waste to hazardous waste incinerators.

As a result of this survey it is evident that historical releases of PFOS is much significant than actual emissions of PFOS in Turkey. Most of the PFOS containing articles ended up in landfills, wild deposition sites and in environment. Therefore it is necessary to carry out detailed analysis in environment matrices in order to determine the risks arising because of PFOS emissions.

In conclusion, hard chromium plating is an important ongoing source of PFOS to the water environment in Turkey. Aqueous Fire Fighting Foams and Aviation hydraulic fluids are the other two major ongoing sources which also constitute and historical release due to past uses. Further research must be carried out in order to complete a mass balance study on these three sectors of concern.

Based on the knowledge, all articles that might have contained PFOS in the past, are either landfilled or disposed in wild dumpsites. In fact, PFOS accumulation is expected to occur in soil and groundwater media. Analytical investigations are recommended in order to determine the extent of contamination so far.

2.3.3. Unintentionally produced POPs (uPOPs) (Annexes C and III of the Conventions)

Unintentionally produced POPs represent very complicated problem from the point of view of the very broad spectrum of potential sources which include combustion, technological, chemical and other processes. The optimal way to the reduction of potential emission of uPOPs can be done by the defining of the emission limits which have to be closely connected with the second way – the application of the principles of Best Available Techniques (BAT) and Best Environmental Practice (BEP).

Under the Stockholm Convention on Persistent Organic Pollutants (POPs), Parties are required to reduce total releases from anthropogenic sources of the chemicals listed in Annex C with the goal of continually minimizing and, where feasible, ultimately eliminating releases of these unintentionally produced chemicals. Toward this end, Parties must develop action plans as part of their National Implementation Plans (NIP) to identify, characterize and address the releases of unintentional POPs listed in Annex C. Action plans to be developed according to Article 5 of the Convention shall include evaluations of current and projected releases that are derived through the development and maintenance of source inventories and release estimates, taking into consideration the source categories listed in Annex C.

To achieve the goal of the Convention, Parties are required to implement or promote best available techniques (BAT) and best environmental practices (BEP), as described in the "Guidelines on Best Available Techniques and Provisional Guidance on Best Environmental Practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants".

Five years after developing their action plan, Parties are required to review their adopted strategies, including the extent to which their unintentional POPs releases have been reduced, and to incorporate such reviews in national reports pursuant to Article 15.

Pursuant to Article 5 of the Convention, the following unintentional POPs are listed in Annex C:

- Polychlorinated dibenzopdioxins (PCDDs)
- Polychlorinated dibenzofurans (PCDFs),
- Polychlorinated biphenyls (PCBs),
- Hexachlorobenzene (HCB), and
- Pentachlorobenzene (PeCBz)

CRLTAP/POPs Protocol has similar approach as the SC concerning to the uPOPs, but more strictly defined the control mechanism concerning to the emission reduction using the emission limits for the main source categories – waste incineration and metallurgy. Other difference is that CRLTAP/POPs Protocol includes also polycyclic aromatic hydrocarbons (PAHs), which are much more toxicologically relevant components of industrial emission. It is also reflected by the WHO limit for benzo(a)pyrene in ambient air.

Among these, PCDDs and PCDFs (also collectively referred to as PCDDs/Fs) have never been used as commercial products, nor were intentionally manufactured for any reason other than laboratory purposes. PAHs, PCBs, HCB and PeCBz are also unintentionally formed, usually from the same sources that produce PCDDs/Fs. However, unlike PCDDs/Fs, they have also been manufactured and used for specific purposes, their intentional production and use being by far higher than the unintentional formation and release. In comparison with this, some PAHs are industrially produced. These are mainly lower molecular weight ones, such are naphthalene, anthracene or phenanthrene.

PCDDs/Fs and PAHs releases are accompanied by releases of other unintentional POPs, which can be minimized or eliminated by the same measures that are used to address PCDDs/Fs and PAHs releases. When a comprehensive inventory of PCDDs/Fs is elaborated, it allows to identify priority sources, set measures and develop action plans to minimize releases of all unintentional POPs.

It is thus recommended by Dioxin Toolkit of the SC, for practical reasons, that inventory activities be focused on PCDDs/Fs, as these substances are indicative of the presence of other unintentional POPs. They are considered to constitute a sufficient basis for identifying and prioritizing sources of all such substances as well as for devising applicable control measures for all Annex C POPs and for evaluating their efficacy.

Only in the context of research or other projects it is advisable to analyze emissions of all unintentional POPs listed in Annexes C and III in order to produce useful information for the purpose of deriving emission factors.

In addition to emission factors for PCDDs/Fs, the Toolkit also contains emission factors for other POPs when such information is available. Typically, emission factors are provided for the five release vectors, i.e., air (EFAir), water (EFWater), land (EFLand), product (EFProduct), and residue (EFResidue). For emission inventory of PAHs, European Emission Guidebook has to be used.

Concerning to PAHs emissions, some information concerning to Turkey are available. Odabasi and researchers have analyzed PAHs in ambient air/stack gas/soil in several studies (Obadasi et al., 2009, 2012; Cetin et al., 2007; Bozlaker et al., 2008a; Cetin and Odabasi 2008; Bozlaker et al., 2008b).

In Odabasi studies in Izmir area it was shown that iron–steel plants with electric arc furnaces are the major PCB, PAH, and PBDE emitters in the study area (Odabasi et al., 2009, 2012). The results of the study by Odabasi et al. (2009) have also shown that substantial amounts of PCBs, PAHs and PBDEs

are emitted in the particle–phase from scrap iron, slag, filter dust storage, transfer and dumping processes, and vehicular traffic (especially trucks) on paved and unpaved roads around the steel plants.

2.3.3.1. PCDDs/Fs Inventory

The results of Turkish uPOP inventory conducted based on the source groups and classifications given in the "Toolkit for Identification and Quantification for Releases of Dioxins, Furnas and Other Unintentional POPs" of the SC, are summarized in **Table AIV/9**.

As shown in **Table AIV/9**, total uPOP releases are distributed into the outflows as follows: 62 % in the residues, 23 % in the atmospheric emissions, 8 % in the products, 6 % in the land, and 1 % in the wastewater discharges.

For the uPOP releases in residues, "ferrous and non-ferrous metal production" and "disposal" facilities are the most important source groups. "Iron and steel production" and "copper production" have the highest contribution within the ferrous and non-ferrous metal production processes, while "disposal of domestic and mixed wastes" is responsible for the entire uPOP amount in the residues caused by the disposal facilities.

For the atmospheric uPOP emissions, "ferrous and non-ferrous metal production" (156.2 g TEQ y^{-1}) has the highest contribution (about 50 %), while "open burning processes" (78.4 g TEQ/y) and "heat and power production" (60.5 g TEQ y^{-1}) are two other important source categories. In the ferrous and non-ferrous metal production, sub-groups of "iron and steel production" (81 g TEQ y^{-1}), "iron ore sintering" (40 g TEQ y^{-1}) and secondary productions of aluminum (13.3 g TEQ y^{-1}), copper (9.4 g TEQ y^{-1}) and zinc (9.4 g TEQ y^{-1}) are the important sources for atmospheric uPOP emissions. In the open burning processes, almost all of the uPOP emissions to air come from the accidental fires at homes and factories (76.8 g TEQ y^{-1}). Finally, utilization of coal for domestic heating (37.9 g TEQ y^{-1}) and/or heat and power generation (10 g TEQ y^{-1}) is the dominant source of uPOP emissions in the source category of "heat and power generation".

For the uPOPs in products, "production of chemicals and consumer goods" (87.4 g TEQ y^{-1}) is responsible for almost all the product uPOPs. About 90 % of the total product uPOP amount in this category comes from the production of textile (32.3 g TEQ y^{-1}) and leather (45.2 g TEQ y^{-1}) products.

For the uPOP releases to land, "open burning processes" (76.8 g TEQ y^{-1}) as the source category, and "accidental fires at homes and factories" as the subsource category within this category, are responsible for almost all the releases.

Finally, the uPOP releases in the wastewaters, which compromise a small part in the total inventory, come from the "production of chemicals and consumer goods" (7.5 g TEQ y^{-1}) and "disposal" facilities (6.1 g TEQ y^{-1}). "The production of chlorinated inorganic chemicals" (7 g TEQ y^{-1}), in the first category; and "leachates from the solid waste landfills (4.8 g TEQ y^{-1}), especially from those for hazardous wastes" in the second category, are the major contributors of uPOPs in wastewater.

The current uPOP inventory is compared to the previous inventory (baseline inventory, which was based on 2006 data) and the changes are evaluated. For comparison, the previous inventory is revised with respect to new data and emission factors firstly. The revised 2006 uPOP inventory for Turkey is summarized in Table **AIV/10.**

Comparison of two inventories shows that there is an estimated decrease of 36 % in total uPOP amount from 2010 to 2013. Changes of the uPOP releases with respect to type of the releases, and to source categories are given in **Figures 1 and 2**, respectively. The significant decrease in the air emissions (about 67 %) explains the difference between two inventories to a large extent. Moreover, uPOP releases to land and residues display some decreases about 20 % and 12 %, respectively. On the

other hand, uPOP releases in the wastewaters and products increase about 20 % from previous to current inventory.

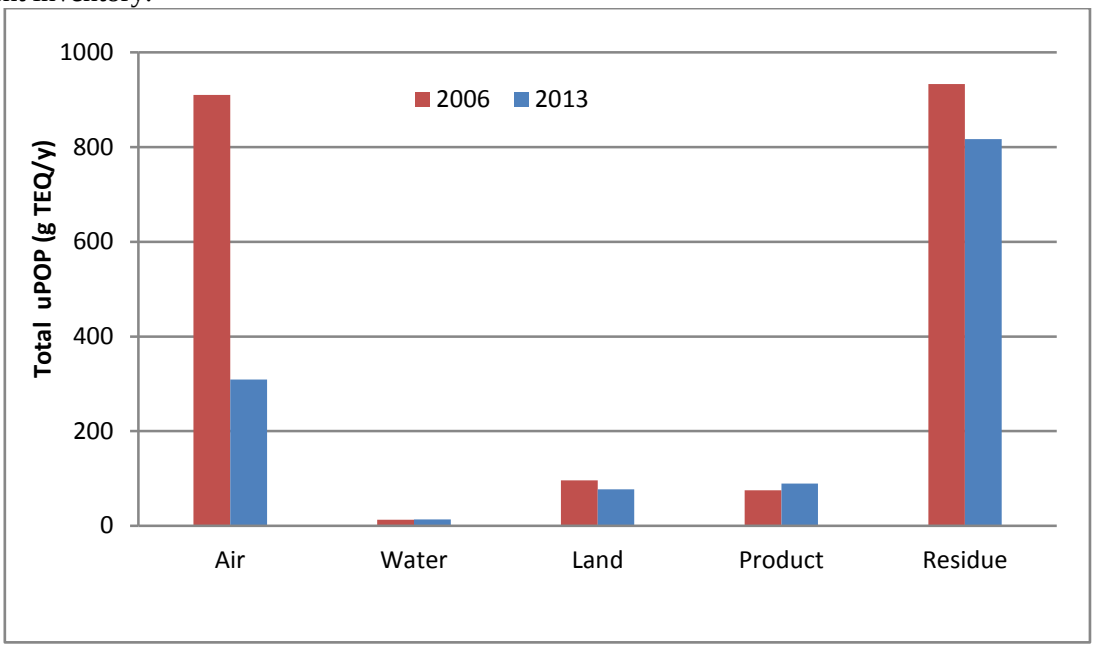

Figure 1: Change of the uPOP releases in Turkey from 2006 to 2013 with respect to types of releases

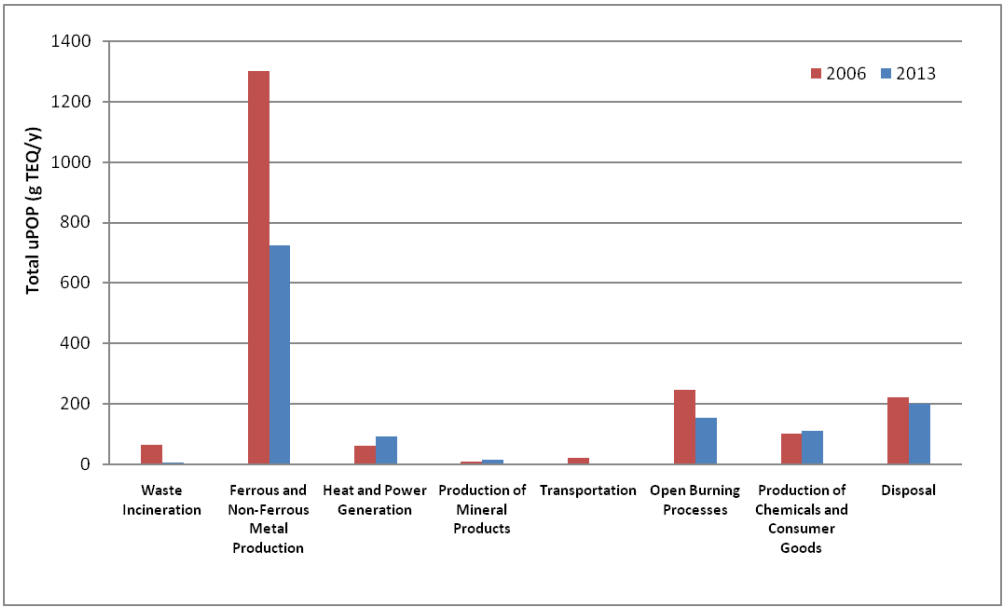

Figure 2: Change of the uPOP releases in Turkey from 2006 to 2013 with respect to source categories

An assessment of the changes in the uPOP releases for the individual source categories in the inventories of 2010 and 2013 shows that the significant decrease in total uPOP releases come mainly from ferrous and non-ferrous metal production processes (about 45 %). Therefore it has a critical importance in the decrease in total uPOP releases. It seems that the environmental investments and amendments made for air pollution control in recent years in the metal industry have resulted in a significant decrease in the atmospheric uPOP emissions in this sector. It should be noted that ferrous and non-ferrous metal production processes are still the most important sector with the highest

contribution also to the 2013 uPOP inventory in Turkey. However the efforts of this sector to reduce the uPOP emissions (especially in the coke production and iron ore sintering plants to control the emissions to air) should be taken into account.

Additionally, a strict legislation and related controls in the open burning processes such as burning of agricultural residues have provided a decrease of about 40 % in this category. There were also substantial decreases in the uPOP releases originated from waste incineration and transport also, although their effect on the total release is limited. On the other hand the releases from heat and power generation, production of mineral products, production of chemicals and consumer goods and disposal facilities displayed increases in different percentages ranging from 6 % to 35 %. The increase in the uPOP releases from heat and energy production is mainly related to the increase in the utilization of coal in recent years. The uPOP increases originated from the production of mineral products, chemicals and goods are generally consistent with the increases in the production of these materials. Similarly, the increase of uPOP releases from the disposal facilities is a result of the increase in the domestic and industrial wastes, which is in turn related to the increase in population and industrial production in recent years.

2.3.3.1. Unintenionally produced PCBs

In the first NIP of Turkey, the unintentional production of POPs was assessed in a wide range of thermal and industrial chemical processes. As is the case for many countries, the preparation of complete inventory for unintentionally formed PCBs is not possible. Since there is no systematic data on the topic of concern, the available data given for this purpose only reflects the scientific literature relating emission sources by the environmental compartments.

Accordingly, an unusual abundance of deca-chlorobiphenyl (#209) with little or no contribution of other highly chlorinated PCB congeners was observed in surface sediments of İzmit Bay close to the chlor-alkali plant and petroleum refinery. Despite the fact that it is unexpected to find PCB 209 in the environment, the presence of such congener enriched in signatures suggests an indicator of near source emissions. On the other hand, iron-steel plants were considered as hot spot for PCBs in air and soil medium. Annual national PCB emissions from electric arc furnaces were calculated in the range of 89 - 2 800 kg/yr using the annual production amounts and the emission factors generated in their study. A more comprehensive data is given in **Table AIV/11** estimated from the stationary emission sources contributing to atmospheric PCB levels in Turkey. According to results, two hot spots were located namely in Aliağa (İzmir) and Dilovası (Kocaeli) industrial regions.

The formation and release of PCBs in uncontrolled combustion activities is another important source of unintentional PCBs in Turkey.

2.3.3.2. Other unintentionally produced POPs

There is no available official emission inventory of polycyclic aromatic hydrocarbons, hexachlorobenzene and pentachlorobenzene in Turkey.

2.3.4. Stockpiling, Wastes and Contaminated Sites

Effective management of POPs is a global crucially important issue since they can persist in the environment, are subjected to long range transport i.e. travel long-distances and accumulate in fatty tissues of living organisms. Therefore, POPs stockpiles are of a great concern both for protection of the environment and human health.

In order for Turkey to take necessary measures on POPs, determination of the location of the contaminated sites, the condition of POPs stockpiles and the amount of POPs used as well as

conducting valid and accurate the inventories, necessary administrative and technical infrastructure must be established.

For this purpose of assessment of contaminated sites legislation is prepared and an inventory preparation system will be effective by 2015. The Regulation on Control of Soil Pollution and Sites Contaminated by Point Sources will initially determine the contaminated or possibly contaminated sites. Then after determination of these sites, the locations of these sites will be recorded on the Database on Contaminated Sites by Point Sources.

This inventory system will work as demonstrated in the **Figure 3.**

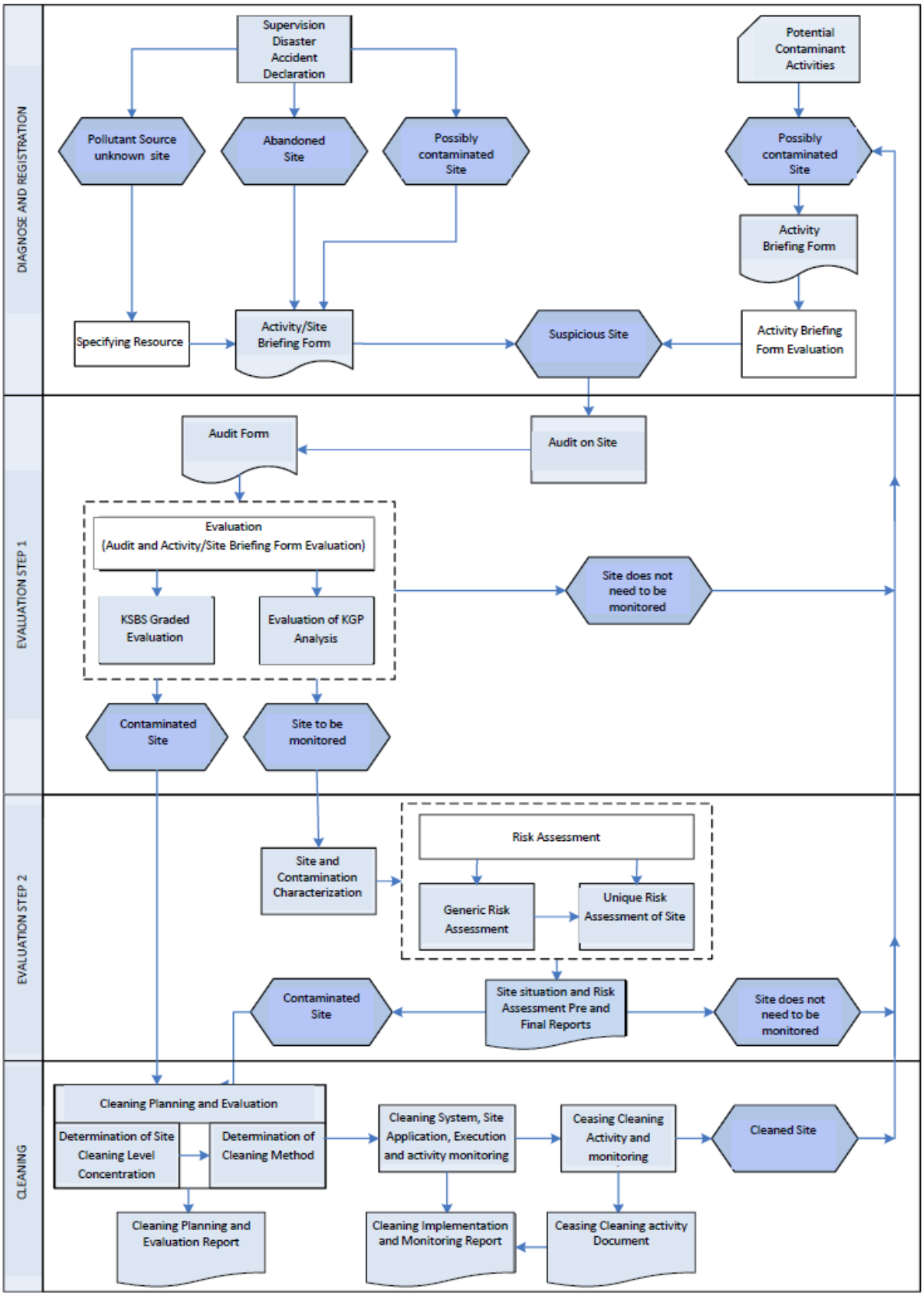

Figure 3: The inventory approach on Contaminated Sites

The information on the inventory of POPs stockpiles and contaminated sites is presented in this report as prepared by the task teams and are summarized in **Annex V.**

In order to limit or where possible, eliminate the negative effects of POPs, restriction or prohibition of the production and use of these chemicals, environmentally suitable disposal of POPs stocks and cleaning the polluted areas are needed.

The task teams researched for areas where the POPs stockpiles are located and tried to determine both the quality and quantity of the POPs where the contaminated areas are located. The objective of this research was to address the priority issues and action plans regarding the disposal of the stockpiles, conduct preliminary inventory of the contaminated sites, assess the options of disposal of the expired stockpiles. These possibly POPs contaminated sites are illustrated in **Annex V** and in the case of uPOPs are summarized below. However, in order to give accurate results detailed laboratory analysis should be conducted accordingly.

Summary of sites contaminated or potentially contaminated by POPs

Identification of historical activities that could have POPs contamination and identification of the potentially contaminated sites are the first steps of the procedure to be used in the assessment of contaminated sites and hotspots. However, there are very limited data available on sites possibly contaminated with especially PCDDs/Fs and/or other uPOPs.

A review of the available data and related information on the historical loadings might lead to a classification of the contaminated sites in Turkey as follows:

- The sites with some evidence showing that the site is contaminated with POPs:

    - MERKIM Site
    - Dilovası Region
    - İzmit Estuary (Körfez) Region
    - Sites where previously PCB containing transformers were abundantly used (e.g. power plants in Kütahya-Seyitömer, Ambarlı were listed in NIP of 2010 to contain such transformers) or iron-steel plants such as the one in Karabük).

- The sites with no current data/evidence but high possibility to be contaminated with uPOPs and/or POPs (i.e. vicinity of iron-steel plants):

    - Aliağa Region
    - Ereğli
    - İskenderun
    - Karabük
    - Gebze

- The sites possibly contaminated with uPOPs

    - Industrial areas in Marmara Region
    - Historical pulp and paper production sites
    - Timber manufacture and treatment sites
    - Kaolin or ball clay sites
    - Textile and leather production sites

Since there are limited studies on these sites in Turkey, further investigations on the levels of POPs in these sites and their potential health risks have a critical importance with respect to public and environmental health. Therefore, it is suggested that comprehensive studies should be conducted as soon as possible to assess the potential risks of such sites in details.

The same situation of course exists as it was mentioned also in all sites contaminated or potentially contaminated by intentionally and unintentionally produced old and new POPs.

Additional Report on POPs contaminated site inventory in Turkey

As a part of the project "Technical Assistance for Implementation of the Persistent Organic Pollutants Regulation (TR2010/0327.03-01/001)" financed by the EU and Turkey additional inventory of the POPs contaminated sites was performed (Annex XIV).

The objective of this inventory was to provide supplementary information to the NIP of Turkey for effective implementation of regulations related to POPs. For this purpose, an overview of contaminated or potentially contaminated sites (PCS) in which contamination is suspected but not verified, was provided together with the main outputs demonstrating how these sites can be managed properly due to the large extent of research topic. Specifically, this inventory intended to:

i. the inventory on sites contaminated with the current POPs (22) and other persistent toxic substances (PTS) such as polyaromatic hydrocarbons (PAHs), petroleum hydrocarbons (PHs)
ii. recent information on existing contaminated sites in Turkey
iii. recent information on potential contaminated sites in Turkey
iv. action plans for handling contaminated sites
v. a report that contribute to the development of implementation framework for NIP

Currently, there is no known or systematically proved contaminated site in Turkey. On the other hand, Turkey has gained notable economic success over the last decade and continues to growth. According to the Global Competitiveness Report 2013-2014, Turkey is classified in transition from Stage 2 to Stage 3 (9 000-17 000 GDP per capita (US$)) together with 21 economies around the world in line with well-known economic theory of stages of development (Annex XIV). This classification allowed us to simply determine the cost of managing the CS or PCS which is an important constituent to be considered by the policy makers.

2.3.5. Future POPs Production, Use and Emissions

As Annex A and B chemicals will never be produced or used in Turkey there will not be registration or request any regarding specific exemption.

There are studies concerning the reduction of POPs releases. The most important ones among them are EU IPPC Directive's adaptation projects. As a result of these projects, future unintentional POPs releases using Best Available Techniques and Best Environmental Practices criteria will be accomplished. By using Standardized Toolkit the future unintentional POPs releases are demonstrated in **Table 5**. This estimation was developed in the previous version of the NIP and it was used again by UNIDO project for the preliminary estimation of the emission situation. But it is a necessary to respect that Toolkit used the default values only and this estimated development not reflect the measures and activities of the Turkish industry and government. For more serious estimation, the real data concerning to the measures and their effectiveness coming from industry, have to be used.

Table 5: Future POPs Releases

Year		**2002/03 Reference Inventory**	**2010**	**2020**	**2030**
Unintentional Production		[g I-TEQ]	[g I-TEQ]	[g I-TEQ]	[g I-TEQ]
Pesticide	Production	0			
	Use	0			
PCB-HCB	Production	0			

	Use	10	7.2	5.8	4.6
PCDD/F		407.9	293.6	234.9	188

These estimates are done via Standardized Toolkit of UNEP.

2.3.6. Current Programs and Results on Monitoring of POPs Emissions and Effects on Human Health and Environment

There is no systematic monitoring program on POPs emissions, releases and occurrence in the abiotic /biotic or technical matrices in Turkey. However some POPs (hexachlorobenzene, pentachlorobenzene, endosulphan) will be monitored as a part of By-law on Surface Water Quality Management and By-law on Monitoring of Surface and Ground Waters. Studies on monitoring POPs periodically will be included in the National Monitoring Network and monitoring programmes as a part of the By-law on monitoring of Surface and Ground Waters and specific parameters.

The CRLTAP-POPs Protocol urges parties to develop policies and strategies to combat the discharge of air pollutants through exchanges of information, consultation, research and monitoring.

In addition, a systemic monitoring background will be developed as a part of EU POPs Rules Harmonization process and related e-PRTR Rules. Moreover, there are several academic survey and research studies conducted in different media where possibly POPs concentrated regions and results of these studies are present. A selection of academic research results are illustrated in **Annex VI.**

2.3.7. Current level of information, awareness and education among target groups; existing systems to communicate such information to the various groups; mechanism for information exchange with other Parties to the Convention

As a candidate country for membership to the EU, awareness of public on technical and social fields as well as environmental issues is rising. Also, informing the public for environmental issues by publishing environmental accidents by mass media. After the corporatization of telecommunication sector significant raise is observed on involvement of public, knowledge exchange and accessing information. Websites of public enterprises, non-governmental organizations and international foundations are providing a means by which people can access environmental information.

In order for Turkey to have a successful environmental policy, every region should realize the function of environment and potential problems that may occur. This emphasizes the need for environmental training at every region of the country. For this purpose, every Turkish citizen must be aware of the problems and accept their responsibilities for environmental protection by continuous and extensive training programmes at every level. Environmental training is included in the syllabus of primary schools in Turkey. There are studies on training of decision makers, training of all related source executives, raising awareness of public and raising the motivation for supporting the environmental activities. Some of the related foundations and organizations are given below:

- Associations and non-governmental organizations
- County Services
- Press foundations
- Religious Associations and foundations
- Universities and Research Institutes
- Ministries and related foundations
- Schools

2.3.8. Activities of Non-Governmental Stakeholders related to POPs

Non-governmental organizations have a great role raising awareness of public about POPs in Turkey. Specifically, the NGOs which serve as umbrella organizations have provided a major contribution to effective information sharing with its members on activities related to POPs. For example, the Chamber of Industry and Trade has a crucial role on this subject.

In addition, some non-governmental organizations like IMMIB, TCUD, TCMB, TTD works for providing inventory information, helping candidate foundations to apply as well as many other activities.

Mass media in Turkey is very interested in environmental problems and they are preparing special shows about environment including POPs. That mass media interest creates a great advantage on raising awareness of public about dangers of POPs.

Waste exchange researches, is rapidly increasing in Turkey because of the tight controls and punishments. Many markets are founded in industrialized cities Istanbul, Ankara, Bursa, Kocaeli and Adana. Those markets are controlled by the Chambers of Industry located in related cities. Special attention has to be given to the system of collection, separation and disposal of wastes.

Even if, there is a visible raise in those markets activities, there are still some problems caused by non-registered activities, declaring wrong information about wastes or waste amounts.

2.3.9. Overview of technical infrastructure for POPs assessment, measurement, analysis, alternatives and prevention measures, management, research and development - linkage to international programs and projects

Turkey has adapted many EU Legislations during the EU Harmonization process and conducted projects in this respect. The projects listed below contributed to build infrastructural and institutional capacity to meet Turkey's liabilities and responsibilities to the Stockholm Convention on POPs. Turkey has conducted projects in regards to components within the scope of EU harmonization and technical assistance – **Annex VII.**

2.3.10. Identification of Impacted Populations or Environments, Estimated Scale and Magnitude of Threats to Public Health and Environmental Quality and Social Implications for Workers and Local Communities

Declaration and Reporting of Priority Pollutant Releases

DDT was the most commonly used POPs chemical. Therefore it ranks first in the priority list. Aldrin, dieldrin and endrin together formed the second biggest group of POPs chemicals that have been analyzed.

Hexachlorohexane is also one of the most widely used POPs pesticide in Turkey. It can be said it takes the third position.

Current Monitoring Standards and Capacity for POPs

There is no previously performed or currently ongoing monitoring programme or study for POPs in Turkey.

In the scope of the regulations published by the Ministry of Health Institution of Public Health the Department of Customer Safety Laboratory can measure the persistent organic pollutants in trace amounts in drinking, tap and natural mineral water on a routine or unprompted basis for control monitoring, audit monitoring or licensing.

Monitoring of POPs will be carried out based on the By-law on Monitoring of Surface and Ground Waters.

Also the accredited laboratories that can carry out POPs analysis are listed in **Annex VIII**.

Current Occupational Safety Measures of POPs Pesticides and PCBs

The POPs chemicals have long been banned in Turkey and since they are no longer in use, there are some occupational safety measures for these chemicals.

For the period in which POPs chemicals were used in the country, the ILO guidelines for occupational some safety measures were taken into consideration.

Moreover, Regulation on Health and Safety Measures in Occupations with Chemical Substances (12th August 2013, No: 28733) which is under the scope of Law on Occupational Health and Safety (No: 6331) has clauses concerning potential POPs and other chemicals.

Employers, has liabilities and responsibilities to prevent employees exposure to the chemicals and take precautions to minimize the risk of the hazards caused by the chemicals when exposure cannot be avoided. Additionally, the employers are responsible for the following:

- To have done a risk assessment,
- To take precautions when working with the hazardous chemicals,
- To take precautions in case of an emergency,
- To train the employees
- To receive the opinions and make sure of the participation of the employees,
- To observe the health status of the employees

The employers are responsible for determination of a chemical of concern's presence and conducting a risk assessment with respect to the Regulation on Occupational Health and Safety Risk Assessment when a chemical of concern are present **(Annex IX).**

A review of the extent of exposure of the human population and environment in Turkey to POPs was carried out. The inventory covered the extent to which POPs is not an issue in Turkey. However, encouragement of research and monitoring in grey areas, training of specialists, conducting of studies on health effects of the public. Priority areas that need urgent attention include training of specialist in clinical toxicology and well equipped national accredited laboratories.

2.3.11. Details of any relevant system for the assessment and listing of new chemicals (Existing regulatory schemes for assessing new chemicals)

Pesticides and industrial chemicals have different registration procedures in Turkey.

The registration procedure of agricultural pesticides is given in the Regulation for the Registration of Plant Protection Products of Ministry of Food, Agriculture and Livestock (MoFAL) published in the Official Gazette no: 27885 on 25 March. 2011. Based on this regulation, after the firms obtained the certificate of activity, when the firms applied for the registration of a plant protection product the prepared information and document are assessed by the Ministry of Food Agriculture and Livestock. This assessment is carried out by reviewing the plant protection product by means of toxicology and ecotoxicology, physical and chemical properties, residues and environmental impacts, biological activity etc. The basic certification information and documents are reviewed by the "Committee of Registration of Plant Protection Products" formed by a group of experts working for MoFAL. After the evaluation process, plant protection products are registered if the plant protection product is approved.

The biocidal products (insecticides, raticides, molluscicides, etc.) used in public health sector are licensed according to Regulation on Biocidal Products (No: 27449) published on 31st December 2009 in the official gazette.

The registration procedure is very much like the one for pesticide registrations of MoFAL.Chemicals that are hazardous, dangerous, or toxic for the environment and human beings or animals are registered according to the By-Law on Classification, Packaging and Labelling of Dangerous Substances and Preparations (Official Gazette no:27092 dated 26 December 2010) By-Law on Inventory and Control of Chemicals (Official Gazette no:27092 26 December 2010 and its amendment Official Gazette no:27402 dated 10 November 2009) By-Law on Compilation and Distribution of Material Data Sheets (Official Gazette no: 27092 dated 26 December 2010), By-Law on Restrictions on the Manufacturing, Marketing and Use of Certain Dangerous Substances, Preparations and Articles (Official Gazette no: 27092 dated 26 December 2010) of the Ministry of Environment and Urbanization (MOEU) In the frame of these by-laws; the detailed information of producers, identification of produced chemicals, the production, imports, and use data of these chemicals (including the predicted data of production and use), chemical, physical, and ecological properties, and means of disposal have to be submitted to MOEU.

Pesticides, consumer chemicals and toxic and hazardous substances are either banned or under control by regulation in Turkey. However, these substances are not sufficiently monitored by the related institutions. Unregistered use of some chemicals can be possible via smuggling from neighbor countries. Industrial chemical producers and their chemicals are not registered by responsible ministries. The data of production and sales are collected by SIS, and the Undersecretariat of Foreign Trade monitors foreign trade. The lack of good monitoring practices and insufficient research are handicaps preventing assessment and listing of new chemicals.

Production and sale data are compiled by the Turkish Statistical Institute. The new training program should be started for development of a system for the assessment and listing of new chemicals.

2.3.12. Details of any relevant system for the assessment and regulation of chemicals already in the market (Existing regulatory schemes for assessing chemicals already in the market)

The plant protection products in the market are inspected according to the Regulation on the Control of the Plant Protection Products published in Official Gazette no: 27939 on 20 May 2011. Audits are conducted in regards to product, label, factory, market, process, and complaints of consumers. During the audits, the specifications of the product, its impacts on plant, disease, insect and weed when applied as recommended, are inspected or analyzed_in the authorized laboratories. The audits are executed by General Directorate of Food Control and responsibility given Provincial Directorates of

MoFAL. After the audits the reporting is done to the General Directorate of Food Control and penalties are imposed if necessary as stated in the regulations.

The chemicals' market monitoring and audits each institution is responsible for market monitoring and auditing within its own scope of work. The market monitoring and audits for the biocidal products are the responsibility of the Turkish Institution of Public Health within the scope of the Regulation on Biocidal Products.

The placing on the market of a dangerous preparation in Turkey requires notification of the Ministry of Environment and Urbanization (MoEU), the Ministry of Food, Agriculture and Livestock (MoFAL) and the Ministry of Health (MoH). The information submitted at least on the day of its placing on the market includes: the identifying of the firm placing it on the market, trade name of the dangerous preparation and its safety data sheet or other data to obtain permission (Article 3 and Annex D).

A person dealing with the trade, production, packaging and labeling of dangerous chemicals are inspected by MoEU according to the provisions of the Regulation for Dangerous Chemicals. Inspections led by MoEU officials are executed via random sample collection from the market or directly from producers. The specifications of products and information given on the label are checked for the accordance with the provisions of mentioned Regulation and with the registration of producers filed in MoEU. Samples are collected in accordance with the related standards of Turkish Standards Institute. Imports of some chemicals are controlled by annually published Statement of Product Safety and Audit for Foreign Trade and importers are obligated to receive a Control Certificate issued by MoEU. However, the inspection system of industrial chemicals should be designed to work efficiently.

3. Strategy and Action Plan Elements of the POPs National Implementation Plan

3.1. Introduction

The main strategy objectives of the POPs NIP are in the consequence with the NIP 2010 are follows:

- Preparation of the new legislation covering the process implementation of the Stockholm Convention and POPs Protocol in the context of the EU POPs regulation
- Continued efforts on inventory of old and new POPs as a tool for decision making process
- Elimination of POP releases into the environment and reduction of human exposure to POPs
- Elimination of Legacy POPs Stockpiles
- Application of BAT/BEP (Best Available Techniques/Best Environmental Practices) principles as key principles of the future industrial development strategy
- Inventory of the contaminated sites with special attention to POPs
- Preparation of national monitoring programs with the goal of realizing tasks associated with the implementation of the Stockholm Convention and POPs Protocol of the CLRTAP.

Concerning results of the national POPs inventory, in Turkey some POPs pesticides were regulated and for these chemicals a trend towards decreasing POP releases into the environment and humans can be observed. Similar situation exists in the case of polychlorinated biphenyls.

PCDD/F emissions were not addressed in the past in Turkey and only during recent years the first measurements in the cement industry and a few metal industries have been performed.

Information concerning the new POPs mainly brominated and fluorinated and PAHs are very scarce.

For the preparation of the POPs NIP, the following facts would be significant:

- Turkey already has a significant current release of PCDDs/Fs emission (1 315 g TEQ $year^{-1}$). The metal industry having the highest inventoried PCDDs/Fs emissions in Turkey is a booming industry and plan to increase capacity. In addition, Turkey having very limited incineration capacity plans the construction of a range of incinerators and it can be expected that a considerable share of waste which is currently sent to landfills might be diverted towards incineration or thermal recycling in the future. Therefore, emissions from Annex II sources of the Toolkit can be expected to increase in Turkey in the future and PCDDs/Fs emission would increase if not appropriate BAT/BEP strategies are developed and implemented.
- Based on the fact that a huge amount of PCBs, materials containing PCBs and PCB containing equipment will necessitate destruction in the coming years, it will be imperative to resolve the question concerning their environmentally sound destruction, so that potential environmental contamination and human exposure can be prevented.
- Provisions regarding new POPs and continuing additions to the POPs list.
- Briefly, Turkey signed the Stockholm Convention and it is ratified. In reference to the country's status for the POPs issue and the NIP within the overall national policy and legislative framework relation to environmental protection, sustainable development and public health would be included. It is also a good base for ratification of the CRLTAP/POPs Protocol.

3.2. POPs National Priority Areas

Eight main POPs priority areas of concern have been identified as follows:

- Legislative applications including regulation and enforcement
- Inventory of emissions, releases, stockpiles and contaminated sites (for POPs of both Conventions)
- Reduction of releases of intentionally and unintentionally produced POPs
- Capacity building in the regulating and permitting governmental sector and also in private sector (e.g. POPs management, BAT/BEP implementation)
- Public education and awareness raising
- Monitoring and control of public health and environment
- Information exchange and networking, inter-ministerial coordination, and
- Research into the extend of exposure of the population to POPs and the research for safer alternatives

3.3. Activities, Strategies and Action Plans

This subsection has been prepared to implement the country obligations under the Stockholm Convention and CRLTAP/POPs Protocol. Specific targets, milestones and performance indicators are outlined to allow progress of implementation to be reviewed and monitored.

3.3.1. Institutional and Regulatory Strengthening Measures

In Turkey, the issues of chemicals including POPs are of great concern. There are comprehensive legislations for Conventions on POPs which mandate Parties to take certain measures to achieve the objective of the Conventions. A successful implementation of the Conventions in Turkey would therefore involve the integration of some of these provisions into the current institutional and regulatory framework for managing chemicals in the country.

The objective is to prepare sufficient and effective legal base for prevention of the production and use of new pesticides and industrial chemicals that are deemed to be candidates of POPs. This activity is focused on the development and implementation of more effective legal and regulatory base, effective institutional structure and sufficient capacities for the inter-ministerial and complex solution of the old and new POPs issues.

In Turkey, Annexes A, B and I and II contents have been banned 10 to 15 years ago by legislation. Therefore the legislation concerning these chemicals should be tailored to the need of the country and the Conventions. The regulation directed to reduction and elimination of unintentional releases of Annexes C and III uPOPs.

It may be appropriate to draft the regulatory instrument that allows flexibility to expand the list of substances prohibited as need and circumstances require. For this requirement, the ongoing legal gaps (Annex X) and SWOT analysis (Annex XI) of the Turkish legislation will be used. SWOT Analysis Table for POPs management is given in Table 6. These two legal analyses will be used as a key background document for the development of the Turkish POPs By-law.

Table 6: SWOT Analysis Table for POPs Management

STRENGTHS	WEAKNESSES
• Ratification of Stockholm Convention and its amendments by means of law • Existence of chemicals management system with institutional and legal framework. • Experience in developing chemical strategies with regards to EU legislation. • Experience in developing current subordinating chemical legislation with regards to EU legislation. • Trained experts of the competent authority on the concept and goals of the POPs legislation • Trained experts of the competent authority and relevant authorities with scientific knowledge on POPs. • Existence of ongoing projects on POPs that will support the establishment of the system on management of POPs. • Existence of some provisions on POPs in the legislation of competent and relevant authorities. • Development and update of NIP in line with Stockholm Convention. and CRLTAP/POPs Protocol	• Non-existence of harmonisation between existing law and EU legislation • Non-existence of a legal framework in the field of POPs with current subordinate legislation. • Non-existence of harmonisation between existing law and subordinate legislation of different authorities. • Existence of complex institutional framework for POPs management. • Non-existence of mechanism and process for POPs management. • Non-existence of sufficient infrastructural and institutional support for POPs management. • Low level of public awareness as POPs is a new concept for the public. • Inadequate financial and human resources for POPs management. • Non-existence of regulatory impact assessment on POPs especially cost and benefits analysis studies. • Non-existence of inter-institutional Joint Management Committee. • Non-existence of a general directorate for chemicals. • Lack of information, inventory is not realized as permanent, ongoing process. • Non-existence of coordination between the authorities and institutions. • Non-existence of harmonisation and connection between strategic and related development documents. • Non-existence of a specific inspection and permitting department dealing with POPs management. • General low level of awareness on actions specified in the previous SC NIP, resulting in very low level of implementation of SC NIP measures.
OPPORTUNITIES	**THREATS**
• Existence of competent and relevant authorities/institutions at state level • Partly existence of the structure for the implementation of legislation on POPs which needs capacity development. • Development of international cooperation and correlation on POPs with Convention Secretariats and through links made in numerous international technical assistance and other projects. • Development of BAT and processes that eliminates intentional and unintentional involvement of POPs. • Establishment of an integral POPs monitoring and implementing system as a separate General Directorate in MoEU further institutional strengthening of the other relevant authorities. High level of international cooperation shall be resorted to, in order to support BAT to be used in industry. • Organisation of trainings for raising the level of awareness of the industry and the public. • Increased share of Turkish trade organizations via adoption of BAT/BEP regarding POPs in the production sector. • Synergy of three conventions (the Basel, Stockholm and Rotterdam Conventions).	• Affirmative conflict of duty on POPs management • Instability of people in positions of importance for POPs management, including those receiving specific training. • Sustainability of the current ministerial organization. • High costs of BAT and new processes to be used for POPs management. • Non-allocation of funds for supporting the implementation of the Convention, trainings and other activities. • Incomplete and non-functional institutional restructuring for efficient management of POPs. Inability of institutions to follow through on responsibilities specified in NIP, e.g.role in inter-ministerial committees, etc. • Horizontal and vertical disconnection between the Competent and Relevant authorities • Non-existence of cooperation and information flow between the Competent and Relevant authorities and all other stakeholders • Failure in harmonisation and connection between strategic and related development documents in the forestry, agriculture and health and the field of POPs management. • Disconnection and poor coordination between the government and non-government sectors and between the academic institutions • Insufficient data that can mislead the stakeholders in the POPs management.

Key measures of the Activity:

- To harmonize the Turkish legislation in line with the SC, CRLTAP/POPs Protocol and EU POPs regulation including the subordinate legislation
- To implement to the Turkish subordinate legislation technical aspects connected with the new and candidate POPs
- To support the POPs National implementation plan and updating National POPs Inventory by legal regulative instruments.
- To establish an institutional and organizational framework for supporting the implementation of the Convention and CRLTAP/POPs Protocol and the subordinate legislation
- To define and implement the coordination process between individual department of the Ministry of Environment and Urbanization and other responsible ministries and institutions as key strategic process for successful and effective implementation of the POPs NIP measures.
- By using the GAP Analysis and SWOT Analysis Reports of the TA Project for the identification of various governmental departments and institutions that should be involved in subsequent stages of the POPs management process.

Activity 1: Action Plans for institutional and regulatory strengthening measures

Activity 1: Institutional and regulatory strengthening measures			
AP number	**Action Plan**	**Time**	**Control**
AP1.1	To harmonize the Turkish legislation in line with the SC, CRLTAP/POPs Protocol and EU POPs regulation including the subordinate legislation and to use the SWOT Analysis Report for the preparation of the draft by-law on POPs.	2015	XII/2015
Responsibility	MoEU in co-operation with MoH, MoFWA, MoFAL		
AP1.2	To implement the Turkish subordinate legislation technical aspects connected with the new and candidate POPs. It represents: • to provide legislative resolution to problem of the treatment of fly ash from incinerators and other facilities including a new categorization of dumping sites. • to provide legislative resolution to the problem of POPs disposal, a preference of non-combustion technology to establish standards for POPs disposal based on the principle of POPs destruction efficiency. • to provide legislative resolution to the problem of legislative approved incineration of oils in small facilities. • to give legislative resolution to the problem of storing of hazardous waste at dumping sites (newly-created “hot spots”) • to restrict the recycling of PFOS and related chemical containing articles and materials • to restrict the recycling of PBDEs and other BFRs containing articles and materials • to expand the prohibition list to newly adopted chemicals • to establish effective system of information concerning to newly adopted chemical available to all relevant institutions • to prohibit the production and industrial use of	2017	XII/2015, XII/2016 XII/2017

Activity 1: Institutional and regulatory strengthening measures			
AP number	**Action Plan**	**Time**	**Control**
	hexochorobenzene, hexachlorocyclohexanes, PBDEs, PFOS • to prohibit the export and import of PBDEs, HBCD and other POPs other than PCBs as pure chemicals or products • to regulate export of POPs pesticides • to control the production of new industrial chemicals • to revise the information list required in the process of certification of pesticides and include there the physical-chemical properties, bioaccumulation potential and ecotoxicological data		
Responsibility	MoEU in co-operation with MoFAL, MoENR		
AP1.3	To implement the Turkish subordinate legislation technical aspects regulation limits connected with the new and candidate POPs. It represents: • To supplement the Turkish legislation with the limiting values of POPs in sewage (environmental risks, contamination of food chains, to adjust the method of processing sewage in industrial operation) • Update the limiting values of POPs in the legislation for control of soil contamination Official Gazette 31th May 2005, no: 25831 • To implement a limit for PCDDs/Fs content and re-evaluate limits for other POPs in waste.	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with MoFAL, MoENG, MoSIT, MoH		
AP1.4	To support the National implementation plan of the SC and updating National POPs Inventory by legal regulative instruments. It represent: • Annual permanent control of the implementation of the NIP measures • Support of the continuous upgrade of the National POPs inventory	2015	XII/2015
Responsibility	MoEU		
AP1.5	Establishment of the institutional and organizational framework for supporting the implementation of the Stockholm Convention CRLTAP/POPs Protocol and the subordinate legislation and definition and implementation of the coordination process between individual department of the Ministry of Environment and Urbanization and other responsible ministries and institutions as key strategic process for successful and effective implementation of the NIP measures including the effective co-operation with the Chemicals Council.	2015	XII/2015
Responsibility	MoEU		
AP1.6	Nominate and ensure the activities of the Stockholm Convention National Focal Point and official reporting of Turkey to the SC	2015	V/2015

Activity 1: Institutional and regulatory strengthening measures			
AP number	**Action Plan**	**Time**	**Control**
Responsibility	MoEU		

3.3.2. Management of Annex A Pesticides

This section in NIP should be considered under the framework on operative measures of Annex A POP-Pesticides. Special attention has to be done to old storage and illegal storage of pesticides.

Activity 2: Action Plans of Annex A POP-Pesticides

Activity 2: Action Plans of Annex A POP-Pesticides			
AP number	**Action Plan**	**Time**	**Control**
AP2.1	To update of inventory of old agrochemical stores, deposits and loads and contaminated sites and update the database	2015	XII/2015
Responsibility	MoFAL in co-operation with MoEU, agricultural and environmental inspections		
AP2.2	The control of existing old interim storage sites and dumping sites, improve inspections and maintance in order to prevent accidents or leaking/exposure and prepare annual report	2015	XII/2015
Responsibility	MoFAL in co-operation with MoEU, agricultural and environmental inspections		
AP2.3	To clean, empty and demolish POPs pesticides storage buildings using the BAT/BEP procedures, development of safe temporary storage if needed	2018	XII/2015, XII/2016, XII/2017, XII/2018
Responsibility	MoFAL in co-operation with MoEU		

3.3.3. Management of PCBs and PCB Containing Equipment

Certain actions in the previous National Implementation Plan report related to production, import and export, use, identification, labeling, removal, storage and disposal of PCBs and equipment containing PCBs were completed by the legislations issued and entered into force. These legislations are "By-Law on Control of Polychlorinated Biphenyls and Polychlorinated Terphenyls" published in the Official Gazette dated 27.12.2007, "By-Law on Control of Waste Oils" published in the Official Gazette dated 30.07.2008 and "By-Law on Incineration of Wastes" published in the Official Gazette dated 06.10.2010.

Problem however is that, the system is not in use currently.

Activity 3: Action Plans for manufacture, import, export, use, identification, labeling, removal, storage and disposal of PCBs and PCB containing equipment

Activity 3: Manufacture, import, export, use, identification, labeling, removal, storage and disposal of PCBs and PCB containing equipment			
AP number	**Action Plan**	**Time**	**Control**
AP3.1	Ensuring the continuation PCBs inventory of closed, semi closed and open PCBs sources	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoI, MoE… and industrial associations		
AP3.2	Identification and labelling the equipment containing PCBs more than 50 ppm before 2018	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		
AP3.3	Ceasing the usage of PCBs and PCB containing equipment as soon as possible, and no later than 2025	2023	Annually XII
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		
AP3.4	Ensuring the inventory of PCBs contaminated sites and lands, PCBs stock sites	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with the MoI, MoE, universities. Research insitituions as well as industrial associations		
AP3.5	Constituting a system that licences the facilities which collect and dispose PCB wastes to solve the PCB waste problem.	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		

AP3.6	Defining liabilities for public institutions about PCB containing wastes in the National Hazardous Waste Management Plan and complete the National Implementation Plan for the management of PCB containing wastes	2015	XII/2015
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		

AP3.7	The stockrooms with PCB including waste and equipment have to be secured by the owners of the facilities. Regular control of these stockrooms and all transfers of wastes and equipment have to be done.	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		

AP3.8	Choosing environmentally sound methods for the purification and disposal of the transformers and capacitors, disposal of the PCBs and PCB containing wastes has to be key point of PCB waste management.	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with the MoI, MoE and industrial associations		

3.3.4. Management of BFRs

The following action plans are determined based on the Turkey's first inventory conducted on PBDEs. This action plan include improvement of custom control, improvement of PBDEs and other brominated flame retardants and its periodical update, stop the use of BFRs and implement the use of the most appropriate alternatives, application of BAT/BEP in the relevant industrial uses, awareness raising activities, increasing the effectiveness of the waste management system concerning to the waste with contents of BFRs, assessment and restriction of BFRs containing materials recycling, environmental sound management and environmental safe storage of BFRs and related chemicals containing materials, disposal and destruction of BFRs and related chemicals and BFRs containing articles/products.

Activity 4: Action Plans for production, import and export, use, stockpiles, and wastes of brominated flame retardants

Activity 4: Production, import and export, use, stockpiles, and wastes of brominated flame retardants			
AP number	**Action Plan**	**Time**	**Control**
AP4.1	Performing, improvement and periodical update of the inventory of PBDEs including the assessment of waste flows - overall inventory of the transport sector including an inventory of end-of-life vehicles (including future time perspective).	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP4.2	Performing, improvement and periodical update of the inventory of PBDE-containing WEEE plastics including the assessment of waste flows	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP4.3	Performing, improvement and periodical update of the inventory of PBDEs in minor applications (construction/insulation, PUR foams, textile, furniture, mattresses, rubber) including the assessment of waste flows	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP4.4	Update of the Customs Office database concerning to the export and import of brominated flame retardant chemicals and articles with these pollutants and prepare protocols between Customs Office and MoEU to obtain the records of these chemicals easily in more comprehensive manner.	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the UC, MoSIT, MoE and industrial associations		
AP4.5	Assessment of recycling activities and currently used technologies of WEEE plastics	2016	XII/2015,

			XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		

AP4.6	Assessment of recycling activities and currently used technologies of PUR foam	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		

AP4.7	PBDE-containing materials to be stored and disposed of in an environmentally safe manner	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		

AP4.8	Assessment of appropriate destruction technology for brominated flame retardants and usage of BAT/BEP principles on destruction technologies for waste containing there substances	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		

3.3.5. Management of DDT

DDT is not produced, imported, exported and used in Turkey. The stockpiles and wastes of DDT and this issue are discussed in previous chapters in previous sections.

Activity 5: Action Plans for management of DDT

Activity 5: Management of DDT			
AP number	**Action Plan**	**Time**	**Control**
AP5.1	To update inventory of production, import and export, use, stockpiles and wastes of Annex B chemicals	2016	XII/2015, XII/2016
Responsibility	MoFAL ín the co-operation with MoEU, agricultural and environmental inspections		

3.3.6. Management of PFOS

This activity include improvement of custom control, improvement of PFOS and related chemicals inventory and periodical update, stop the use of PFOS and related chemicals and implement the use of the most appropriate alternatives, application of BAT/BEP in the relevant industrial uses, awareness raising activities, assessment and restriction of PFOS and related chemicals containing materials[1] recycling, environmental sound management and environmental safe storage of PFOS and related chemicals containing materials, disposal and destruction of PFOS and related chemicals and PFOS containing articles/products.

Activity 6: Action Plans for production, import and export, use, stockpiles, and wastes of PFOS, its salts and PFOSF (Annex B, Part III chemicals)

Activity 6: Production, import and export, use, stockpiles, and wastes of PFOS, its salts and PFOSF (Annex B, Part III chemicals)

AP number	Action Plan	Time	Control
AP6.1	Performing, improvement and periodical update of the inventory of PFOS currently used in metal plating and plastic plating industries, fire-fighting foams and stocks, aviation fluids, carpets, and other uses and assessment of past use and disposal of these pollutants.	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP6.2	Update of the Customs Office database concerning to the export and import of PFOS chemicals and articles with these pollutants and prepare protocols between Customs Office and MoEU to obtain the records of these chemicals easily in more comprehensive manner.	2015	XII/2015
Responsibility	MoEU in cooperation with the UC, MoSIT, MoE and industrial associations		
AP6.3	Assessment of recycling activities and currently used technologies of PFOS and related chemicals containing articles	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP6.4	PFOS and PFOS containing articles/products and materials to be stored and disposed of in an environmentally safe manner	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial associations		
AP6.5	Assessment of appropriate destruction technology for PFOS and related substances and usage of BAT/BEP principles on destruction technologies for waste containing there substances	2016	XII/2015, XII/2016
Responsibility	MoEU in cooperation with the MoSIT, MoE and industrial		

[1] The recycling of PFOS containing articles is not under the specific exemptions listed by the Convention. Therefore recycling of PFOS containing articles is not allowed. Since it might take place (e.g. for synthetic carpets) it need to be considered and assessed and possibly restricted.

	associations		

3.3.7. Activities and Measures to reduce releases from the unintentional production of POPs

Although total uPOP releases in Turkey reduced about 35 % in the last three years mainly due to the measures taken for the control of air pollution from industrial sector, releases of uPOPs is still too high in Turkey and the levels of uPOPs contamination from past activities are largely unknown. The results of the updated uPOP inventory show that the metal industry is still the most important sector for the release of uPOPs to air and residues, while disposal of municipal and industrial solid wastes, open burning processes, production of some consumer goods including leather and textile industry, and heat and power generation by coal combustion are other source groups with considerable contribution to the total inventory.

The data concerning to the emission of toxicologically very important PAHs and also HCB and pentachlorobenzene are fully unknown.

Activity 7: Action Plans for reduction, elimination and control of uPOPs

Activity 7: Reduction, elimination and control of uPOPs

AP number	Action Plan	Time	Control
AP7.1	Preparation more accurate national emission inventory and inventory of potential sources of the uPOPs with the special attention to the PAHs including determination of the country specific emission factors from main industrial categories and establishment of a national inventory database for the activity rates given in the Toolkit to reduce the uncertainties	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT and MoENR		
AP7.2	Establishing the national inventory system of the uPOPs emissions (PRTR)	2018	XII/2015, XII/2016, XII/217, XII/2018
Responsibility	MoEU in co-operation with MoSIT and MoENR		
AP7.3	Improvement of the controls of potential emission sources of uPOPs, especially open burning mainly agricultural wastes, fires of industrial plants and dumps	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT and MoENR		
AP7.4	Improvement of the controls of other potential emission sources of uPOPs, especially on illegal use of waste and base-oil mixtures and also production/import of uPOPs-containing chemical and materials	2018	XII/2015, XII/2016, XII/217, XII/2018
Responsibility	MoEU in co-operation with MoSIT and MoENR		
AP7.5	Developing strategies to control the uPOPs emissions and revising the related regulations accordingly	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT and MoENR		

AP7.6	Promoting the implementation of BAT/BEPs for the control of uPOPs emissions		
Responsibility	MoEU in co-operation with MoSIT and MoENR		

3.3.8. Identification of stockpiles, articles in use and wastes plan for assessment and management of releases from stockpiles and wastes

Key step of this Activity is to take in order to eliminate the problem associated with historical pollution caused by legacy POPs stockpiles and wastes containing and potentially containing old and new POPs. This is closely connected with the valid inventory of stockpiles, POPs waste and POPs-containing materials waste and the development and completion of the national waste information system.

From the perspective of environmentally sound waste management, it is necessary to solve the problem of economic set-up of the relationship of recycling-burning-dumping and discharging the waste to receiving environment. Also the long-term storage of materials containing any type of POPs in dumping sites is inappropriate from the environmentally sound management point of view. These will eventually pose risk both on public health and environment and thus, can only be regarded as a temporary solution requiring necessary safety measures to be taken in case of any possible environmental contamination.

Activity 8: Action Plans for identification of stockpiles, articles in use and wastes plan for assessment and management of releases from stockpiles and wastes

Activity 8: Identification of stockpiles, articles in use and wastes plan for assessment and management of releases from stockpiles and wastes

AP number	Action Plan	Time	Control
AP8.1	Realization of the existing POPs and POPs-containing stockpiles and wastes inventory and development the national database of these problems	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with MoSIT		
AP8.2	Prioritisation of the problems and assessment of the connected human and ecological risks	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with MoSIT		
AP8.3	Evaluation of appropriate BAT/BEP procedures and strategies for elimination of the current stockpiles and wastes, ensure temporal safety storage facilities before the final disposal including the preparation of Guidelines and safety procedures for collection, transport and store of these types of stockpiles and wastes	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		
AP8.4	Prohibit the landfilling of hazardous wastes	2016	XII/2015, XII/2016

Responsibility	MoEU in co-operation with MoSIT		

AP8.5	To ensure the licensing, operation, tracking and control of storage facilities including handling and transport procedures	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		

AP8.6	Prepare financial plan for the programme of disposal of the POPs stockpiles and wastes	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		

3.3.9. Identification of contaminated sites (Annex A, B and C Chemicals) and remediation in an environmental sound manner

This section defines actions to conduct a thorough inventory of contaminated areas with an analysis of ecological risks, to evaluate the necessity of decontamination, along with an economic evaluation, assessment of performing such an activity as a basis for the management of contaminated areas.

Key step of this Activity is to eliminate the problem associated with historical pollution caused by legacy POPs stockpiles, contaminated sites, all legacy ecological burdens containing POPs. This is closely connected with the valid inventory of all these problems and the development and completion of the database of hotspots, old stockpiles, and contaminated areas.

The database will be a key tool for the process of definition of national priorities and decision making process connected with the solution of the priority problems and their sufficient financial support.

The process of inventory has to be connected with the investigation of localities, assess the risks and suggest corrective measures (including the input of new information into the existence data).

Other important part is prevention of new ecological burdens, new contaminated sites due to ongoing industrial activities and connected potential environmental problems such as disposal of fly ash from incineration of wastes, sewage sludge, solid waste disposal and other new potential sources of POPs contamination.

Activity 9: Action Plans for identification of contaminated sites (Annex A, B and C Chemicals and Annexes I, II and III) and remediation in an environmentally sound manner

Activity 9: Identification of contaminated sites (Annex A, B and C Chemicals and Annexes I, II and III) and remediation in an environmentally sound manner

AP number	Action Plan	Time	Control
AP9.1	Realization of the existing POPs contaminated sites inventory with special attention to newly listed and candidate POPs and development the national database of contaminated sites (metallurgy, petrochemical sites, asphalt producers and users).	2020	XII/2015, XII/2016, XII/2017, XII/2018, XII/2019, XII/2020
Responsibility	MoEU in co-operation with MoSIT		
AP9.2	Prioritisation of the problems and assessment of the connected human and ecological risks	2020	XII/2015, XII/2016, XII/2017, XII/2018, XII/2019, XII/2020
Responsibility	MoEU in co-operation with MoH		
AP9.3	Evaluation of appropriate BAT/BEP procedures, strategies and Guidelines for remediation of contaminated sites	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		
AP9.4	To ensure the licensing of remediation companies	2016	XII/2015,

			XII/2016
Responsibility	MoEU in co-operation with MoSIT		

AP9.5	Prepare financial plan for the programme of remediation of priority contaminated sites	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		

AP9.6	Documenting and assessing the available remediation technologies and international experiences for remediation of sites contaminated by old and new POPs	2017	XII/2015, XII/2016, XII/2017
Responsibility	MoEU in co-operation with MoSIT		

3.3.10 Facilitating or undertaking information exchange and stakeholder involvement

Information exchange is vital for sound management of chemicals. Efficient information exchange on POPs in Turkey would ensure that all stakeholders involved in all aspects of national chemical management and safety required information will be related with their needs.

Activity 10: Action Plans for facilitating or undertaking information exchange and stakeholder involvement

Activity 10: Facilitating or undertaking information exchange and stakeholder involvement			
AP number	**Action Plan**	**Time**	**Control**
AP10.1	After establishment of a permanent inter-ministerial coordination committee, to prepare the system of information exchange (reports, news, websites) connected with the SC POPs and other relevant international information sources (CRLTAP, EU..).	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT		
AP10.2	Ensure continuous information exchange concerning new POPs of the Customs services and other relevant governmental bodies.	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT and UC		
AP10.3	Ensure close collection of information from the Secretariats of the international conventions and regional centres of the SC	2016	XII/2015, XII/2016
Responsibility	MoEU		

3.3.11 Public awareness, information and education

Successful implementation of the POPs NIP in Turkey will only be achieved, when the public is sensitized and aware on the nature of POPs and their effects on human health and environment. It is therefore important for actions to be directed to promote the continued and detailed public awareness, training and information on POPs.

Key element of this Activity is to develop and produce public awareness program on POPs (brochures, posters, newsletters, radio and TV educational programs, articles etc.) focused on the POPs problems on the international and national scales.

Other important aspect of this activity is to develop information concerning to the protection of public health and environment and also information concerning to behavior and activities of political and decision making sphere, industry, public with the target to explain how to protect oneself, how to protect environment. An effective coordination between Ministry of Health Turkish Institution of Public Health and General Directorate of Emergency Health Services National Poison Consultancy Centre should be established. It can be done by organization of the workshops, seminars, trainings and training and information materials.

Activity 11: Action Plans for public awareness, information and education

Activity 11: Public awareness, information and education

AP number	Action Plan	Time	Control
AP11.1	Developing of the national information strategy concerning to the chemical pollution problems with special attention to the POPs	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT, MoH and MoNE		
AP11.2	Ensure education programmes and training for relevant institutions (ministries, custom service, administrative, scientists, teachers..) on the national, regional and local scales	2016	XII/2015, XII/2016
Responsibility	MoEU in co-operation with MoSIT, MoH, UC and MoNE		
AP11.3	Ensure public available POPs website with relevant information concerning to POPs problems	2015	XII/2015
Responsibility	MoEU		
AP11.4	Ensure the preparation of brochures, posters, bulletins, tv clips, educational video programmes concerning to the POPs problems (sources, disposal, human and environmental impacts)	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT, MoH and MoNE		
AP11.5	Awareness raising of policy and decision maker authorities on POPs	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT, MoH and MoNE		

3.3.12 Assessment of Effectiveness

The Stockholm Convention Article 16 requires parties to establish mechanisms for providing comparable monitoring data on the presence of Annex A, B and C Chemicals. This evaluation shall be conducted on the basis of available scientific environmental, technical and economic information including national reports.

For the process of effectiveness evaluation of the implementation of the convention in Turkey, evaluation program including format for evaluation national performance evaluation criteria, have to be developed. This evaluation is closely connected with the process of information reporting, time schedule of this process and control mechanisms.

Activity 12 Action Plans for assessment on effectiveness

Activity 1: Assessment on effectiveness			
AP number	**Action Plan**	**Time**	**Control**
AP12.1	Annually check compliance and evaluate the effectiveness of the implementation of the convention in Turkey	Annually	XII/y
Responsibility	MoEU		

3.3.13 Reporting

The Stockholm convention, Article 15 on POPs mandates parties to report to the conference of Parties (COP) on measures taken to implement the provisions of the convention as well as the effectiveness of the measures taken.

This process consists of two parts – support of the official country reporting to the SSC and national reporting as a phase of collection of all relevant and required information.

For the first part, each party has to provide to the secretariats statistical data on its total quantities of productions, import export of each of the POPs listed in Annex A and B as well as a list of states from which it has imported/exported for each of such substances. This report will provide a substantial input to the effectiveness evaluation of the convention (Article 16), which will begin four years after the entry into force of the Stockholm Convention.

For the second national scale, the mechanism for reporting, format of reporting and time schedule of reporting have to be defined, approved and accepted.

Activity 13: Action plans for reporting

Activity 1: Reporting			
AP number	**Action Plan**	**Time**	**Control**
AP13.1	Adopt report preparation as an ongoing process based on the considerations of the Secretariat of the Stockholm Convention and Secretariat of the CRLTAP.	Annually	XII/y
Responsibility	MoEU		

AP13.2	Prepare and ensure the national system of collection of all relevant information concerning to the implementation of the Turkish NIP measures and annual reporting of data concerning to emissions, releases, abiotic and biotic occurrence, products, wastes, stockpiles and contaminated sites	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT, MoH		

3.3.14 Research, development and monitoring

Stockholm Convention, Article 11 mandates parties obligate appropriate research, development, monitoring and cooperation pertaining POPs. The first Protocol of the CRLTAP was focused on the monitoring of all sets of CRLTAP pollutants and led to the establishment of the European Monitoring and Evaluation Programme, EMEP. EMEP contains also POPs monitoring in selected matrices. From initial assessment conducted, it was established that Turkey has lack of infrastructure and institutional capacity to handle research and development issues relating to POPs monitoring. A major reason for this could be unsustainable institutional infrastructure and governmental staff.

The support of the research and development of POPs connected problems has to be defined as a national priority. Part of this process has to be oriented also to the research and development of new technologies and biotechnologies focused on the eventual liquidation of problematic waste and contaminated matrices including those containing POPs.

Establishment of the national POPs monitoring system is an essential aspect of the effectiveness evaluation of the implementation of the Stockholm Convention and CRLTAP/POPs Protocol in Turkey.

Activity 14: Action Plans for research, development and monitoring

Activity 14: Research, development and monitoring			
AP number	**Action Plan**	**Time**	**Control**
AP14.1	Define national priorities for the research and development and ensure the financial support of these priorities via projects from the National funds	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		
AP14.2	Targeted research focused on missing information from ongoing national inventory, POPs alternatives and study of human and ecological effects and risks especially in connection with highly contaminated sites	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		
AP14.3	Ensure a national database of research institutions, universities and laboratories working in this field including part which will summarize all relevant project on these topics in a publicly available form	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		
AP14.4	Prepare the design of national long term background monitoring of listed POPs (as a part of national monitoring of chemical pollution) based on the long term strategy of the Stockholm Convention and its Global monitoring plan and EMEP programme of the CRLTAP including the QA/QC system.	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		
AP14.5	To identify appropriate laboratories to monitor all POPs problems	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		

AP14.6	To prepare inter-ministerial design of the monitoring of POPs in environmental, biological, human bio-monitoring and technical matrices and products	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		

AP14.7	To ensure targeted pilot and research studies concerning contents of POPs in environmental matrices and technical materials, products, wastes based on considerations of the NIP	2015	XII/2015
Responsibility	MoEU in co-operation with MoSIT and MoH		

3.3.15 Technical and Financial Assistance

The fulfillment of Turkey's obligations under the Stockholm Convention and CRLTAP/POPs Protocol depend on the provision of adequate financial and technical assistance.

The following actions would be required to enable the country obtain the needed financial and technical support required for the successful implementation of activities and actions to be carried out to achieve the POPs overall objectives.

Activity 15: Action Plans for technical and financial assistance

Activity 14:Technical and financial assistance			
AP number	**Action Plan**	**Time**	**Control**
AP15.1	To ensure a regular annual budget for inventories, disposal, monitoring, research and awareness rising based on the NIP conclusions and measures	Annually	XII/y (?)
Responsibility	MoEU		

3.4 Timetable for Implementation and Measures to Take for Success

The activities within the scope of the POPs National Implementation Plan are designed to be practiced in short, medium and long term. The short term activities (period 3 - 5 years) mostly consist of creating a permanent inventory system and preparation, data gathering and update initial inventory, legislative preparation, sectoral effect assessment and regulatory effect analysis.

Medium term activities (5 – 7 years) are assessment of the chemicals that needs to be banned or restricted by the convention, determination of contaminated sites and the industrial facilities for compatibility with the BAT/BEPs and research studies for implementing these criteria, starting monitoring activities and disposal of some POPs stockpiles left in an environmentally sound manner.

Long term activities (7 – 15 years) consist of disposing the present POPs stockpiles and POPs waste, remediation of the contaminated sites, constituting a permanent monitoring system on POPs and the studies for management of new chemicals added to the Conventions.

3.5 Final statement

For Turkey to full its obligations under the Stockholm Convention for POPs and CRLTAP/POPs Protocol depend on the provision of adequate financial and technical assistance. There are some implementation problems at all levels because of the complex administration system and inadequate administrative capacities due to financial restrictions and human resources.

To ensure the regular annual budget for inventories, disposal, monitoring, research and awareness raising based on the NIP conclusions and measures for technical and financial assistance.

A draft by-law is necessary for the full implementation of POPs legislation in Turkey so transposition of EU Legislation is essential.

The existence of an institutional and organizational framework for supporting the implementation of the POPs legislation should be supported with legislation.

The identification of competent authorities, relevant authorities and stakeholders and their participation/involvement in management process on the implementation of the legal requirements should be defined in the draft by-law in order to ascertain their active participation in the management of POPs especially in decision making process.

Since there are several ministries/organizations dealing with POPs a Joint Management Committee for the management of POPs is essential. Some joint management mechanisms have been formally established pursuant to the provisions of laws and regulations as Chemicals Advisory Committee. In line with the Article 8 of By-law on the Classification, Packaging and Labelling of Dangerous Substances and Preparations in order to harmonize the national policy and ensure information exchange between relavant institutions, the Chemicals Advisory Committee established under the co-odination of Ministry of Environment and Urbanization.

POPs are multidisciplinary and complex and next to the primary environmental aspect, they include a trade aspect as well as many other aspects such as the economic, health, agricultural aspects etc., therefore the involvement of the relevant authorities are essential.

One of the important implementation principle of the POPs NIP, is the inclusion of public and stakeholder participation and contribution and increased their active role in the future implementation of the POPs NIP.

In addition the POPs issue impacts on many sectors of society and economy including policy-making, the public and various interest groups. Relevant national stakeholder institutions and groups were identified, sensitized and assigned with responsibilities from the on set of the UNIDO NIP development process. During preparing the NIP the Ministry of Environment and Urbanization consulted with stakeholders and solicited their advice on the development and content of the plan. All the stakeholders supported the programs and initiatives to ensure that the obligations and the spirit of the Convention were reflected.

But, in the existing legislation the legal framework for its implementation has defined in different legislations as there are mainly 10 ministries dealing with POPs in Turkey as elaborated above.

Stakeholders from many different institutions enounced that the Government of Turkey need to take a leadership role and to work cooperatively with the institutions in implementing the Convention as well as recognizing the existing actions to mitigate POPs as part of the NIP.

However, the active participation of stakeholders from a wide variety of institutions to the training and workshops has indicated that the issues raised by the POPs harmful effects are now acknowledged and awareness raising activities have served its purpose. But it should be noted that these activities should continue in a periodic manner to claim a success on the issue.

For POPs National Implementation Plan to be successful sectoral effect analysis should be carried out involving all sectors. Financial obligations should be designated accurately and realistically for related sectors to the sectors to fulfil all their obligations. Also, performing the short term activities as inventory studies and legislations are important for the other activities to be implemented.

Organisations/institutions relevant to POPs do not have adequate financial and human resources for their programmes. In order to have the adequate human and financial resources at the first instance the requirements should be designed in the NIP.

Rising awareness of public for the convention and obligations will help increasing the efficiency of short, medium and long term activities.

New by-law is necessary in line with the project activities and the ratification of Rotterdam Convention is highly recommended. On July 22, 2010 the Prime Ministry Office General Directorate for Laws and Resolutions has sent the Rotterdam Convention to the Turkish National Grand Assembly to be ratified by means of law.

Evaluation and monitoring of the activities are made partly due to the lack of legal and institutional framework for evaluation plan. Evaluation should be carried out in line with the evaluation plan, and the evaluation plan should be updated regularly by using the evaluation results. In the draft by-law the measures for effective evaluations should be placed and the evaluations should be made timely and correctly and the results and experience should be used as the basis for changing activities and as insight for further implementation of activities.

As a priority, it is necessary to adopt subordinate legislation, to ensure that implementing authorities are established and functioning. Also necessary provisions should be mentioned in the draft by-law to establish a system for inventory and to monitor work results. Inventory will be the first step of determination of financial burden on industry. Other priorities will be defined in the NIP as stated in Fact 7.

The process is not well coordinated and adequate plans and strategies are not produced due to the lack of special provisions in the current legislation. NIP has been prepared by the competent authority however in order to ensure the full implementation of NIP, it should be approved by the Joint Management Committee and should be considered as National Development Plans. The draft legislation should include such provisions on implementation of NIP.

Besides, the strategy and action plan for implementing the Stockholm Convention on POPs should be taken into consideration with Basel Convention and Rotterdam Convention requirements.

Very important for the future implementation of Conventions measures is to establish and support the permanent POPs national inventory team(s) which will continue in inventory of obsolete stocks, wastes, emissions, releases, contaminated sites and potential exposure of POPs. At the same level of significance is to prepare design of the national POPs monitoring network as a part of the national environmental monitoring network established on the CRLTAP/EMEP and SC/GMP rules and considerations. For implementation and management of POPs problems in Turkey, the control mechanism and evaluation of the effectiveness evaluation of the Convention measures have to be clearly defined and established.

Implementation of POPs NIP and Conventions as whole needs much more active role of academia, industry and public.

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