EVALUATION OF TURKEY'S STATUS IN TERMS OF COMPLIANCE WITH THE REQUIREMENTS OF THE STOCKHOLM CONVENTION

A THESIS SUBMITTED TO
GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ESRA ŞILTU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
ENVIRONMENTAL ENGINEERING

APRIL 2014

Approval of the thesis:

EVALUATION OF TURKEY'S STATUS IN TERMS OF COMPLIANCE WITH THE REQUIREMENTS OF THE STOCKHOLM CONVENTION

submitted by **ESRA ŞILTU** in partial fulfillment of the requirements for the degree of **Master of Science in Environmental Engineering Department, Middle East Technical University** by,

Prof. Dr. Canan Özgen _____
Dean, Graduate School of **Natural and Applied Sciences**

Prof. Dr. F. Dilek Sanin _____
Head of Department, **Environmental Engineering**

Assoc. Prof. Dr. İpek İmamoğlu _____
Supervisor, **Environmental Engineering Dept., METU**

Examining Committee Members:

Assist. Prof. Dr. Tuba Hande Ergüder _____
Environmental Engineering Dept., METU

Assoc. Prof. Dr. İpek İmamoğlu _____
Environmental Engineering Dept., METU

Prof. RNDr. Ivan Holoubek _____
Masaryk University, RECETOX, Czech Republic

Assist. Prof. Dr. Barış Kaymak _____
Environmental Engineering Dept., METU

Dr. Menekşe Keski _____
Ministry of Environment and Urbanization

Date: _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Last name: Esra ŞILTU

Signature:

ABSTRACT

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Şıltu, Esra

M.S., Department of Environmental Engineering

Supervisor: Assoc. Prof. Dr. İpek İMAMOĞLU

April 2014, 113 pages

Persistent Organic Pollutants (POPs) are stable, toxic compounds released into the environment due to anthropogenic activities. POPs can accumulate in fatty tissues of living organisms and become concentrated up the food chain, posing a serious threat to environment and human health. Once they are released, POPs participate in long-range transport and can have a widespread effect. Stockholm Convention on POPs, which was adopted in 2001 and entered into force in 2004, is a global treaty to take measures against this global pollution threat. Currently there are 23 POPs listed by the Convention. Turkey has officially become a party to the Convention as of 12 January 2010, resulting in many responsibilities including prohibition/elimination/restriction of use of certain POPs, environmentally sound management of stockpiles/wastes, monitoring of POPs levels and preparation and revision a of national implementation plan. This study aims to evaluate Turkey's status in terms of compliance with these requirements of the Stockholm Convention. For this purpose, a gap analysis is conducted and a critical evaluation of the actions listed in the first National Implementation Plan of Turkey is presented. As a result, a series of recommendations like determining a chemicals management policy,

revision and update of the current legislations and preparation of new legislations, establishment of feasible inventory, monitoring and pollution release and transfer register systems are put forth for better compliance with the Convention requirements. This study is expected to contribute to the establishment of a road map for the control and elimination of POPs in the nation.

Keywords: Persistent Organic Pollutants, Stockholm Convention, Chemicals Management, Environmental Legislation, Turkey

ÖZ

TÜRKİYE'NİN STOCKHOLM SÖZLEŞMESİ ÇERÇEVESİNDEKİ YÜKÜMLÜLÜKLERE UYUMUNUN DEĞERLENDİRİLMESİ

Şıltu, Esra

Yüksek Lisans, Çevre Mühendisliği Bölümü

Tez Yöneticisi: Doç. Dr. İpek İMAMOĞLU

Nisan 2014, 113 sayfa

Kalıcı Organik Kirleticiler (KOK) insan aktiviteleri sonucu çevreye salınan kararlı ve toksik bileşiklerdir. KOKlar canlı organizmaların yağ dokularında birikerek besin zinciri boyunca konsantre olur ve çevre ve insan sağlığı üzerinde ciddi bir tehdit oluşturur. Bununla birlikte, KOKlar çevreye salındıktan sonra uzun mesafeli atmosferik taşınım ile etkileri geniş alanlara yayılabilir. 2001 yılında kabul edilen ve 2004 yılında yürürlüğe giren Stockholm Sözleşmesi, bu küresel kirlilik tehdidine karşı önlem almayı amaçlayan küresel bir anlaşmadır. Hali hazırda Sözleşme ile belirlenmiş 23 KOK bulunmaktadır. Türkiye, 12 Ocak 2010 tarihinde Sözleşme'ye resmi olarak taraf olmuş ve bu tarih itibari ile, belirli KOKların kullanımın yasaklanması/kısıtlanması/ortadan kaldırılması, KOK stoklarının ve atıkların çevreye uyumlu bir şekilde bertarafının sağlanması, çevresel bileşenlerde KOK seviyelerinin izlenmesi ve Ulusal Uygulama Planı'nın hazırlanması ve güncellenmesi gibi yükümlülükleri başlamıştır. Bu çalışma, Türkiye'nin bu yükümlülüklere uyumunun değerlendirilmesini amaçlamaktadır. Bu maksatla, bir boşluk analizi çalışması yürütülmüş ve Türkiye'nin ilk Ulusal Uygulama Planı'nda belirlenen eylemlere ilişkin eleştirel bir değerlendirme gerçekleştirilmiştir. Sonuç olarak, Sözleşme

yükümlülüklerine daha iyi uyum sağlanmasına yönelik, kimyasallar yönetimi politikası belirlenmesi, mevcut yönetmeliklerin güncellenmesi ve yeni yönetmeliklerin hazırlanması ve uygulanabilir envanter, izleme ve kirletici salınım ve taşınım kayıt sistemlerinin kurulması gibi bir dizi öneri geliştirilmiştir. Bu çalışmanın, ülkede KOKların kontrolüne ve tasfiyesine ilişkin bir yol haritası oluşturulmasına katkı sağlaması beklenmektedir.

Anahtar Kelimeler: Kalıcı Organik Kirleticiler, Stockholm Sözleşmesi, Kimyasallar Yönetimi, Çevre Mevzuatı, Türkiye

ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my supervisor Assoc. Prof. Dr. İpek İmamoğlu for her guidance, valuable ideas, support and encouragement not only during this study but also during all my undergraduate and graduate studies.

I would like to thank my examining committee members for their valuable contributions and I would like to express my appreciation to Dr. Menekşe Keski for her guidance, collaboration and support during my thesis study.

I would like to thank Aybala Koç Orhon, Necla Adalı and Gülnur Ölmez and all my colleagues in the Ministry of Forestry and Water Affairs for their support and guidance through my thesis work. It has always been a pleasure and made me feel good to know that you were there whenever I needed. Furthermore, I would like to express my gratefulness to my dear friend Dilan Yeşilyurt for her encouragement and support during this study.

Finally I would like to express my deepest gratitude to my parents Zeynep and Vehbi ŞILTU for their priceless support, encouragement and endless love and also providing me a great family. I owe all I have to you. Moreover, I want to thank my dear sisters Hilal and Tuğba ŞILTU for their support, guidance and priceless love through all my life. They have always been good models for me to follow with their personality and success and they made me feel like a princess by indulging me all the time. They are the prettiest sisters ever. Also, I want to thank my brother Özgür Çelebi for sharing me his knowledge and experiences.

Last but not least, I thank god for giving me my little nephew Müjgan Zehra Çelebi. She has brightened up my life with her existence.

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LIST OF ABBREVIATIONS

BAT	Best Available Techniques
BEP	Best Environmental Practices
CLRTAP	Convention on Long-Range Transboundary Air Pollution
COP	Conference of Parties
DDT	Dichloro diphenyl trichloroethane
EMEP	European Monitoring and Evaluation Program
EU	European Union
HCB	Hexachlorobenzene
HCH	Hexachlorohexane
IPEN	International Pesticides Elimination Network
ME	Ministry of Economy
MEU	Ministry of Environment and Urbanization
MFAL	Ministry of Food, Agriculture and Livestock
MFWA	Ministry of Forestry and Water Affairs
MH	Ministry of Health
MSIT	Ministry of Science, Industry and Technology
NGO	Non-governmental Organizations
NIP	National Implementation Plan
OCP	Organochlorine Pesticides
PAH	Polyaromatic Hydrocarbons

PBDE	Polybrominated diphenyl ethers
PFOS	Perfluorooctanesulfonic acid and its salts
PCB	Polychlorinated Biphenyls
PCDD	Polychlorinated Dibenzodioxins
PCDF	Polychlorinated Dibenzofurans
POPs	Persistent Organic Pollutants
PRTR	Pollutant Release and Transfer Registers
REACH	EU Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals
RECETOX	Research Center for Toxic Compounds in the Environment
SAICM	Strategic Approach for International Chemicals Management
SWOT	Strengths, Weaknesses, Opportunities and Threats
TEQ	Toxic Equivalent
TOCOEN	Toxic Organic Compounds in the Environment Project
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
WWTP	Wastewater Treatment Plant

CHAPTER 1

INTRODUCTION

Since the ancient times, human beings used chemistry and chemicals to meet their basic needs. People produced medicines, personal care products, dyes and food by making use of chemical reactions. Moreover, chemicals were used to protect farmed crops from the pests. Together with the industrial revolution, the need for new and more stable chemicals increased. As a response to this need, xenobiotic organic chemicals were first synthesized in the late 1890s. Since then, they were manufactured and used widely in various industrial processes and agricultural applications. However, starting from the 1960s, adverse effects of these chemicals were recognized and many scientific studies were initiated on the environmental and health effects of chemicals.

Stockholm Convention on Persistent Organic Pollutants was adopted on 22 May 2001 by the United Nations Environment Program (UNEP). Generally, multilateral agreements come into force after the approval of entry into force by a certain number of parties (URL 1, 2014). Signature just represents a state's willingness to be bound by a treaty. In such cases, states which signed the treaty are required to ratify, accept or approve the treaty by an act. Accordingly, Stockholm Convention entered into force 90 days after the deposition of the fiftieth instrument of ratification/acceptance or approval, on 17 May 2004. Stockholm Convention is the only international treaty aiming to control the adverse effects of persistent organic pollutants (POPs) on the environment and human health. Initially, 12 POPs called "dirty dozen" were included in the annexes of the Convention. Most of these pollutants were pesticides. In 2009, amendments were made to the Convention and 9 new POPs called "nasty nines"

were added to the Convention. Afterwards, 2 new chemicals were added to the list in 2011 and 2013. Currently, there are 23 POPs listed in the annexes of the Convention. As of April 2014, 179 states or regional economic organizations are party to the Convention (URL 2, 2008). Turkey signed the Convention on May 23, 2001. However, Turkey ratified the Convention by the decision of Council of Ministers dated July 7, 2009 and became an official party on January 12, 2010. Since then, Turkey has obligations under the Convention in order to contribute to the global management of POPs. These obligations necessitate collaborative efforts. The implementation of the Convention requires joint actions on monitoring, establishment of an inventory system, waste management and policy making. Unfortunately, a cooperative solid effort to fulfill these obligations is not yet established in Turkey. Moreover, it is obligatory to prepare a National Implementation Plan (NIP) and update it when necessary. For this purpose, Turkey prepared and transmitted its first NIP to the Convention Secretariat in April, 2011. However, the first NIP just covered the initial 12 POPs since the amendments entered into force later than the preparation of the NIP. Furthermore, the actions defined in the NIP of Turkey were not followed-through. Therefore, much remains to be done regarding the issue of POPs in Turkey.

The aim of this study is to reveal the current status pertaining to implementation of Stockholm Convention in Turkey and provide practical recommendations for update of legislation and establishment of permanent implementation mechanisms. The main approach by which Turkey's current status is evaluated in this study is by;

(i) examining good examples of other country NIPs,

(ii) evaluating Turkey's current legal and institutional framework pertaining to POPs,

(iii) comparative analysis of the requirements of the Convention via a gap analysis,

(iv) critical review of actions defined in Turkey's NIP as compared to good examples.

For this purpose, brief information on POPs and Stockholm Convention was presented and NIPs of countries implementing the Convention successfully was summarized in Chapter 2. The institutional and legal framework in Turkey was discussed in Chapter 3. After providing background information on national framework, Turkey's status of implementation was evaluated comparatively by conducting a gap analysis. Moreover, the measures and actions designed in Turkey's NIP were assessed individually in detail in Chapter 6 and the deficiencies of these actions were expressed. Consequently, the outcomes of the aforementioned evaluations were assessed comparatively and the recommendations developed for policy making stage and action planning were presented in Chapter 7.

CHAPTER 2

LITERATURE REVIEW

2.1 General Information on Persistent Organic Pollutants (POPs) and Stockholm Convention

Persistent organic pollutants are xenobiotic organic compounds that possess unique physicochemical properties, which make them very stable in the environment. Due to these properties, they (URL 2, 2008);

- become widely distributed throughout the environment and transported to long distances
- remain in the environmental media for very long time periods (many years),
- accumulate in the fatty tissues of living organisms including humans and become biologically concentrated along the food chain
- have toxic effects on humans and other living organisms
- have endocrine disrupting effects.

They were used widely in various industrial applications and agriculture since 1920's. However, the adverse effects of these compounds have been first recognized in 1960's. In 1962, Rachel Carson's book "Silent Spring" was published. Carson claimed that pesticides have detrimental effects on environment and biota and attracted the attention of US Government and public to the use of DDT and other pesticides. Moreover, PCBs and DDTs have been detected in environmental samples and they have been identified as new environmental pollutants in 1966 (Jensen, 1966). Since then, many studies conducted on the environmental and health effects of POPs, their mechanisms of transport and environmental transformations. Scientific studies demonstrated that significant levels of POPs contamination has

been observed in different environmental components even in the remote areas of the world like Arctic and Antarctic regions far from major sources of pollution (Fellin et al., 1996; Galban-Malagon et al., 2013; Kallenborna, et al. 1998; Stern et al., 1997). In 1991, famous brown snow event occurred in the Arctic regions of Canada and POPs like PCBs, DDT, endosulfan and HCH were detected in the brown snow particles (Welch et al., 1991). All of these studies proved that POPs contamination is a transboundary problem and worldwide action and international cooperation are essential for the prevention of the adverse effects of POPs on both environment and human health.

First international attempt to provide a global solution to POPs problem is the Aarhus Protocol under Convention on Long Range Transboundary Air Pollution which was adopted in 1998 by United Nations Economic Commission for Europe (UNECE). The aim of the protocol is to control the emissions of POPs to the air. After that, Stockholm Convention was adopted on 22 May 2001 by UNEP and entered into force on 17 May 2004, 90 days after the deposition of the fiftieth instrument of ratification/acceptance or approval. Currently, 179 states/regional economic organizations are party to the Convention (URL 2, 2008). The aim of the Convention is to protect human health and environment from the adverse effects of POPs. Convention consists of 30 articles 7 annexes. The POPs are approached in three different concepts:

- Annex A: POPs of which production, use, import and export are eliminated
- Annex B: POPs of which production, use, import and export are restricted
- Annex C: POPs produced unintentionally by various processes

Initially 12 pollutants called "dirty dozen" were defined as POPs under the Convention. Then, 11 new pollutants called "nasty nines" were added to the Convention list in 2009. Finally, amendments were made to the Convention in 2011 and 2013 and two new pollutants were included in the Convention. The 23 pollutants listed in the annexes of the Convention are given in Table 2.1:

Table 2.1: Persistent organic pollutants listed in the Convention

Chemical Name	**Use**	**Annex**	**Year**
Aldrin	Pesticide	A	2001
Chlordane	Pesticide	A	2001
DDT	Pesticide	B	2001
Dieldrin	Pesticide	A	2001
Endrin	Pesticide	A	2001
Heptachlor	Pesticide	A	2001
Hexachlorobenzene	Pesticide, industrial chemical	A, C	2001
Mirex	Pesticide	A	2001
Toxaphene	Pesticide	A	2001
Polychlorinated biphenyls	Industrial chemical	A, C	2001
Polychlorinated dibenzo-p-dioxins	Byproduct	C	2001
Polychlorinated dibenzo-p-furans	Byproduct	C	2001
Chlordecone	Pesticide	A	2009
Alpha hexachlorocyclohexane	Pesticide	A	2009
Beta hexachlorocyclohexane	Pesticide	A	2009
Lindane	Pesticide	A	2009
Pentachlorobenzen	Industrial chemical, pesticide	A, C	2009
Hexabromobiphenyl	Industrial chemical	A	2009
Hexabromodiphenyl ether and heptabromodiphenyl ether	Industrial chemical	A	2009
Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride	Industrial chemical	B	2009
Tetrabromodiphenyl ether and pentabromodiphenyl ether	Industrial chemical	A	2009
Endosulfan	Pesticide	A	2011
Hexabromocyclododecane	Industrial chemical	A	2013

2.2 Provisions of the Stockholm Convention

Main provisions of the Convention are listed below (URL 2, 2008):

- Prohibition and elimination of the production, use, import and export of the chemicals listed in Annex A (Article 3.1-a)
- Restriction of the production, use, import and export of the chemicals listed in Annex B (Article 3.1-b)
- Reduction and elimination of the emissions and releases of the chemicals listed in Annex C (Article 5)
- Ensuring the environmentally soundly disposal of wastes and stockpiles contaminated with POPs (Article 6)
- Preparation of a NIP (Article 7).

Some specific exemptions were defined under Annex A and B. The countries which are willing to apply these exemptions have to register to the Secretariat. Currently, Turkey has no registered specific exemptions.

2.3 Tools of the Stockholm Convention

The Convention has some tools and instruments designed for enhancing the implementation. These are described briefly in the following sub-sections.

Conference of Parties (COP)

Conference of Parties (COP) is the main governing body of the Convention and composed of the representatives of the countries party to the Convention. The decisions related to the implementation of the Convention are made by the COP. COP is held generally every two years. The first meeting was held in 2005 in Uruguay and sixth meeting was held in 2013 in Geneva.

POPs Review Committee (POPRC)

POPs Review Committee (POPRC) is a subsidiary of the Conference of Parties. POPRC reviews the chemicals to be listed as POP by the Convention. The members of POPRC are proposed by the governments and representatives are involved from

all the regions. Currently, there are 31 members of the committee from 8 regions. Last meeting of the committee was held in Rome in 2013 (URL 2, 2008).

Regional Centers

Regional centers of Stockholm Convention were established by the Conference of Parties in its fourth meeting in 2009. The objective of the regional centers is to provide technical assistance and technology transfer to the developing country parties. 16 regional centers currently serve in Africa, Asia-Pacific, Eastern and Central Europe, Western Europe and Latin America and Caribbean.

Global Monitoring Plan

Global monitoring plan is one of the most important tools of effectiveness evaluation. The implementation of global monitoring plan is under the responsibility of regional centers. Regional centers prepare the regional monitoring plans and a global coordination group prepares the global monitoring plan, accordingly. This first period of global monitoring activities was finalized in 2009 (URL 2, 2008).

National Implementation Plan

Article 7 of the Convention requires that all parties to the Convention have to prepare a National Implementation Plan (NIP) and submit to the secretariat of the Convention. NIP reveals the strategies and action plans of a country designated to implement the Convention and it is a complete representation of a parties actions, plans and strategies regarding the Convention. Parties have to submit their NIP within two years from the ratification of the Convention and update it within two years of the entry into force of the amendments to the Convention.

Technical and Financial Assistance

Various technical assistance activities are carried out by the secretariat in order to enhance the implementation of the Convention. These are webinars, workshops, guidance document preparation and projects. Guidance documents on developing a NIP, global monitoring plan, review and update of NIP and implementation of BAT/BEPs (Best Available Techniques/Best Environmental Practices) have been prepared by the secretariat and published in the official website of the Convention.

Moreover, it is stated in the Convention that developed country parties may provide financial support to the developing country parties and parties with economies in transition. Apart from that, Global Environment Facility is the interim financial entity that can provide fund for the implementation of the Convention.

Effectiveness Evaluation

Article 16 of the Convention requires evaluation of the effective implementation of the Convention. The effectiveness evaluation is carried out via the assessment of national reports, regional and global monitoring results and non-compliance information collected under Article 17 of the Convention.

2.4 Overview of Studies on Implementation of the Stockholm Convention in Turkey

Studies on implementation of the Stockholm Convention in Turkey started just after the entry into force of the Convention. "Preliminary Inventories of POPs Project" was initiated by Ministry of Environment and Forestry in 2004. The objective of the project was to prepare an inventory of the initial 12 POPs listed by the Convention. The report of the project was published in 2005 and provided the basis for the upcoming studies (Report on Preliminary Inventories of POPs, 2005).

Following this project, the draft NIP of Turkey was prepared in 2006. However, this first draft document was not transmitted to the Convention Secretariat. The draft NIP was revised and updated and published in 2010. The revised NIP was submitted to the Secretariat in 2011. Initial 12 POPs were covered in the first NIP of Turkey.

An overview of the legal and institutional infrastructure in Turkey was presented in NIP and information provided on uses and inventory of POPs together with the existing monitoring studies pertaining to POPs. Moreover, national priorities and strategies of implementation of Stockholm Convention were identified in NIP. The national priorities were (NIP of Turkey, 2010):

- Reduction of the releases of POPs
- Capacity building
- Public awareness

- Human and environmental health, research and control
- Legislation and practices
- Information exchange
- Research on the communities affected by POPs

Based on these priorities, 17 main action categories were listed in the NIP. These actions are evaluated individually in Chapter 6.

2.5 Examples of National Implementation Plans

As stated before, NIPs are complete representations of the states' strategies, policies and practices regarding the implementation of the Stockholm Convention. Parties to the Convention have to submit their NIPs to the Secretariat within a specified time period. A NIP includes comprehensive information on the status of implementation in the country and measures to be taken or actions required are expected to be clearly stated in the NIP. Therefore, preparation of the NIP is of significant importance for implementation of the Convention. In this section, good examples of NIPs are reviewed and introduced. The purpose for such a review is to gain insight into well-prepared NIPs so that a critical evaluation of the Turkish NIP can be made.

2.5.1 Review of the National Implementation Plan of the Czech Republic

Czech Republic is one of the most industrially developed countries among other new member states of European Union. In the past, many POPs were produced in large amounts and used in various applications. For example PCBs were continued to be produced in the country (from 1959 to 1984 as given in Breivik et al, 2007) long after many other European countries ceased production. This situation have led to many environmental and health problems in the country. For this reason, Czech Republic attaches significant importance to the implementation of the Stockholm Convention and a Regional Center of Stockholm Convention was established in the country. Moreover, country's status and activities conducted for the implementation of the Convention were discussed comprehensively in the first NIP of the country and is a good example of a first NIP. For this reason, NIP of Czech Republic was reviewed in this study. The first NIP of the country has been transmitted to the

secretariat on 08.05.2006 and the studies continue on the update of the first NIP. The chapters of this document are listed below (Holoubek et al., 2006):

1. Country Baseline
2. Strategies and Action Plans of the National Implementation Plan
3. Proposals of the Further Development, Capacity Building And Priorities
4. Schedule of the Implementation
5. Findings for the Fulfillment of the National Implementation Plan

Under these chapters the current legal and institutional status of the country, the actions required to implement the Convention and the time frame for the implementation were discussed. However, since the NIP was prepared before amendments to the Convention entered into force in 2009, measures taken to manage only the initial 12 POPs were covered.

Country Baseline

In this section, the legal and institutional status of the country is represented. It is stated that one of the objectives of the State Environmental Policy which was declared in 2004 is to reduce the effects of organic pollutants on the environment and human health. Main institutions related to POPs issue in the Czech Republic are listed in the NIP as;

- Ministry of Environment
  - Czech Environmental Inspection
  - National Park Administrations
  - Czech Hydrometeorological Institute
  - Czech Environmental Information Agency
  - Agency for Integrated Prevention
  - Masaryk Water Management Research Institute
  - The Centre for Waste Management
- Czech Geological Survey
- Administration of Protected Landscape Areas of the Czech Republic
- Agency for Nature Conservation and Landscape Protection of the Czech Republic

- Ministry of Health
  - National Institute of Public Health
- Ministry of Agriculture of the Czech Republic
  - State Phytosanitary Administration
  - Central Institute for Supervising and Testing in Agriculture

The responsibilities are well defined and linked with the needs and objectives of the country. The Ministry of Environment is the main governing institution on environmental issues. The study of the ministry is supported by the subsidiaries and relevant research institutes. For instance, Czech Environmental Information Agency is responsible for providing environmental information and operates the Integrated Environmental Information System. Moreover, this institution is the administrator of the Integrated Pollution Register and The Agency for Integrated Prevention is responsible for the management of integrated pollution prevention activities at the national level.

In addition to these, some information is provided on the manufacturing, use, import and export of POP pesticides and the handling of stockpiles. It is expressed that the historical data on the amounts of use, production and import was available to some extent.

Furthermore, the scope, methodology and the outcomes of the PCBs inventory conducted between 2002 and 2005 are represented in the country baseline. The inventory was taken according to the related government act. The aim of the inventory was to determine PCB containing devices and reveal the amount of PCBs in those devices. Recording sheets prepared and the facilities were asked to fill in these forms. Although significant data was collected, the total amount of PCBs could not be determined since some of the entries in the recording sheets were not mandatory according to the related government act. Due to this fact, a new act was prepared and proposed by the Ministry of Environment and entered into force since 01.01.2002.

The extent of unintentionally produced POPs contamination is also discussed in this part of the implementation plan. Information on atmospheric emissions of these

compounds is collected via the Register of Emissions and Sources of Environmental Pollution. Apart from that, country prepared an emission balance for POPs in the past in accordance with the obligations of the Convention on Long Range Trans-Boundary Air Pollution (CLRTAP). Since an effective inventory and reporting system exists, not much effort is required to determine the emissions of unintentionally produced POPs.

In order to determine the contaminated sites, landfills and wastes containing POPs, the existing databases were used. Different databases exist in the country aiming at collecting data on the specific topics like contaminated sites, pesticide residues and old environmental burdens. These databases constituted the major information sources for the inventory of POPs in wastes, landfills and contaminated sites. However, the exact burden cannot be determined since most of the POPs were not monitored regularly. A solution was proposed in the NIP for this problem and it was supporting of inventory efforts by legislations like defining some reporting responsibilities for the facilities and/or institutions by the regulations.

There are some monitoring programs conducted by different governmental institutions in the Czech Republic with the purpose of revealing the status of environmental pollution. Among these monitoring programs, the ones covering the monitoring of POPs and the implementing institutions are listed in the table below:

Table 2.2**:** Existing monitoring programs in Czech Republic

Monitoring Program	**Scope of the Program**	**Implementing Institution**
The Evaluation of the State of the Environment: Monitoring Xenobiotic Substances in Food Chains	Monitoring of PAHs, PCBs and organochlorinated pesticides at 22 selected sites in agricultural products, feeds, pollen, wild animals, fish, moss, foliage and atmospheric deposition	Ministry of Environment

Table 2.2 (Cont'd)

Monitoring Program	Scope of the Program	Implementing Institution
POPs Monitoring in Ambient Air	Monitoring of PAHs, PCBs, OCPs and occasionally PCDD/F in the atmosphere once a week, in wet atmospheric deposition in every rain event, and in surface waters, sediments, soils, foliage and moss once a year	Czech Hydrometeorological Institute & RECETOX & TOCOEN
Monitoring of Hazardous Compounds in the Hydrosphere of Czech Republic	Monitoring of relevant hazardous substances listed in Water Framework Directive and other EU Regulations in surface and ground water resources	Ministry of Environment
Health Hazards and Consequences of Air Pollution	Monitoring of PAHs in air in 7 selected towns	Ministry of Health
Health Hazards and Consequences of Polluted Drinking Water	Monitoring of benzo(a)pyrene, lindane, HCB, DDT, PCBs in drinking water at 30 selected sites	Ministry of Health
Health Consequences for the Human Organism Caused by Heterogeneous Substances from Food Chains, Dietary Exposure	Monitoring of dietary exposure to PCBs, aldrin, endrin, dieldrin, methoxychlorine, endosulphane, heptachlorepoxide, lindane, and other HCHs, HCB, DDTs in 12 selected towns	Ministry of Health
Health Consequences for the Human Organism Caused by Exposure to Toxic Substances from the Environment – Biological Monitoring	Monitoring of PCBs, OCPs and their metabolites and biological changes in the blood, urine, hair, teeth of adults, children, and breast feeding women in 4 selected towns	Ministry of Health

Table 2.2 (Cont'd)

Monitoring Program	Scope of the Program	Implementing Institution
Ground monitoring of agricultural land	Monitoring of PCBs and OCPs in arable land	Ministry of Agriculture (Central Institute for Supervising and Testing in Agriculture)
Monitoring POPs in selected areas	Monitoring of PCBs and OCPs in areas with several point sources of the contamination and assessment of floods' effect on the contamination of the land	Ministry of Agriculture (Central Institute for Supervising and Testing in Agriculture)
Environmental Burdens Caused by the Motor Vehicle Transport (research and development project)	Monitoring of PCBs, PCDDs and PCDFs between 2001-2002 and estimation of the national emissions until 2015	Ministry of Transport

Apart from the continuous monitoring activities of ministries, universities and private sector conducts some research studies on monitoring of POPs. An important outcome of such monitoring studies and databases in the Czech Republic is that, it was possible to determine country specific emission factors for POPs.

Besides governmental efforts and research conducted by other institutions, NGOs (Non-governmental organizations) perform activities on Stockholm Convention and POPs. The Arnika Association is the most famous NGO dealing with environmental problems. Arnika carried out a project called "Poison-free Future" under Toxic Compounds and Wastes program aiming at the ratification of Stockholm Convention by the country and implementation of the integrated pollution register. Arnika also performed activities on the prevention of POPs generation and an active part of activities of the international organizations like IPEN (International POPs Elimination Network).

Although there are organized and continuous programs and projects dealing with various aspects of the POPs issue in the Czech Republic, it was underlined in the NIP that the importance of specialization on environmental sciences has not been realized and most of the research was not target oriented.

Moreover, it was mentioned that the Czech Republic did not have the sufficient technical capacity for environmentally sound disposal of POPs contaminated wastes and old stocks.

On the other hand, by using the outcomes of the National POPs Inventory performed in 2003 and the regular monitoring programs, levels of POPs in various compartments of the environment were put forth in the NIP.

Strategies and Action Plans of the National Implementation Plan

In this part of the NIP, activities and strategies developed to effectively implement the Stockholm Convention were listed. Eleven different strategies and action plans were determined. Under each of these action plans or strategies, short term activities which are estimated to be completed within 3 years of the publication of the NIP and long term strategic goals were defined. Moreover, each action was associated with responsible institutions. The details of the activities and strategies are introduced in the following sections:

Action Plan 1: Institutional and Regulatory Measures

The specific needs for the update of the existing legislations and the need for making new regulations have been covered by this action plan. The deadline and the responsible institution have been determined for each of the specific actions. Some examples of the proposed actions are establishment of National POPs Center, updating the POPs limit values for soils, evaluation of the advantages of Integrated Pollution Register system on the inventory of POPs. Long term goal of this plan was designated as the promotion of the implementation of Stockholm Convention by the actions of Interministerial Committee for the Chemical Safety and National POPs Center.

Action Plan 2: Production, Import and Export, Use, Stocks, Landfills and Wastes from Chemical Substances Listed in Annex A, Part I of Stockholm Convention

The short term activities defined were the regular inspections of pesticide storage facilities, detection of the old production and storage facilities and determination of their contamination. In addition to these, preparation of a report on the removal and appropriate disposal of old OCP stocks according to the BATs was proposed as a short term activity. The responsible institutions for these actions were given as the Ministry of Agriculture and Ministry of Environment. Long term objective of this action was stated as the inclusion of OCPs in the regular monitoring programs and assessment of the data on sources and emissions of POPs in order to optimize the monitoring studies.

Action Plan 3: Production, Import and Export, Use, Identification, Labeling, Removal, Storage and Disposal of PCBs and Facilities Containing PCBs

The short term activities were making a complete inventory of PCBs including the contaminated sites old stocks, designing a collection system for wastes containing PCBs to ensure the safe storage of these wastes and integrate the requirements of Stockholm Convention into the National Waste Management Plan. Ministry of Environment was assigned as the responsible institution. The long term strategic goal of this action plan was providing the environmentally soundly disposal of POPs contaminated wastes, controlling the environmental effects of POPs and determining any new possible sources of POPs.

Action Plan 4: Releases from Unintentional Production (By-products of PCDDs/Fs, HCB and PCBs)

The approaches to control the releases from unintentional POPs production were expressed under this action plan. The developed short term actions were taking an inventory of the emissions of PCBs, PCDD/Fs, PAHs and OCPs and integrating its outcomes to the related strategy documents and programs like National Waste Management Plan and BREF documents. Moreover, preparation of a plan to reduce the levels of halogenated substances in the environment, products and wastes and

providing a solution to the problem of HCB transportation were determined as the short term actions. The responsible institutions were the Ministry of Environment, the Ministry of Industry and Trade and the Ministry of Transport. The long term objectives of the action plan were controlling the POPs emissions from waste incineration facilities, controlling the potentially hazardous by products of thermal processes, reducing the POPs emissions resulting from the coal and waste burning, making an inventory of the disposal of transportation waste, identification and control of the possible POPs sources.

Strategy: Identification of Important Stocks, Commodities in Use and Wastes-Plan for the Assessment and Reduction of Releases from the Landfills and Wastes: Pesticides, DDT, PCBs and HCB

The strategy developed for the control of POPs emissions from landfills and wastes was summarized under this part of the NIP. The designated short term activity was the updating of the inventory of contaminated sites and environmental burden due to the past use of POPs and integrating its outcomes to the existing databases. The Ministry of Environment was the responsible institution for this activity. Long term objective of this strategy was to determine the POPs emissions from WWTPs (Wastewater treatment plans), make an inventory of these emissions and assessment of the technical investment needs to control the emissions and promoting research on environmentally sound disposal of wastes containing POPs.

Action Plan 5: Identification and Corresponding Management of Contaminated Sites

The activities designated for the control of contaminated sites were represented under this part in the NIP. The short term activity was defined as the proposal of a systematic national inventory program for the historical environmental burdens due to POPs. Ministry of Environment was the responsible authority. Long term goals of the action plan were taking the inventory of contaminated sites, assessment of the environmental and health effects concurrently and the needs for remediation. Furthermore, ensuring the prevention of occurrence of new contaminated sites and

promoting the employment of in situ techniques for the remediation of contaminated sites were other long term objectives of this action plan.

Strategy: Ensuring the Exchange and Accessibility of Information

Strategies developed to provide available information to public and all related institutions and enhancing the coordination and information exchange between the institutions were discussed in this part of the NIP. The short term activity was determined as the establishment of a National POPs Center and Ministry of Environment and all the related institutions were assigned responsible for this action plan. The long term objectives of the plan were improvement of the coordination mechanism between the relevant institutions and ensuring that the representatives of the relevant institutions would attend the international organizations on the POPs issue.

Action Plan 6: Public Awareness, Information and Education

There were no short term activities defined under this action plan in the NIP since these activities might be continuous activities. Development of public awareness and education programs, integrating these programs into the existing educational programs and providing easily accessible information to public on POPs issue were the objectives of the action plan. Ministry of Education, Youth and Sports and Ministry of Environment were the main responsible institutions but all the relevant institutions and NGOs were expected to be involved in the activities.

Action Plan 7: POPs Monitoring

Needs for the optimization of monitoring activities were defined under this action plan in the NIP. Short term activities were the assessment of current monitoring programs and development of a long term monitoring strategy and an effective mechanism addressing the requirements under the international agreements. The long term objective of the action plan was ensuring effective implementation of the monitoring system to be developed. Ministry of Environment was the main authority for the implementation of the action plan with the cooperation of Ministry of Health, Ministry of Agriculture and Ministry of Transport.

Action Plan 8: Reporting

All of the actions defined under this action plan were continuous actions; therefore, none were short term actions. Reporting the outcomes of the POPs inventory and status of the achievement of the action defined in the NIP were defined as the continuous activities in this action plan. Ministry of Environment, Ministry of Health, Ministry of Agriculture and National POPs Center were assigned responsible.

Research and Development Strategy

As in the case of reporting activities, there were no short term activities defined for this strategy. The long term objective was to support the scientific studies and research projects addressing the needs of the country related to the POPs issue. Specific research topics of high priority were identified in the NIP.

2.5.2 Review of the National Implementation Plans of Germany

Germany is one of the most developed countries in the world. Various industrial activities are carried out in the country like chemicals and automobile production and a variety of chemicals are being used in the industrial processes for many purposes. Therefore, chemicals management is of significant importance in Germany. Because of this reason, Germany is one of the countries which implement the Stockholm Convention efficiently. Germany ratified the Convention on 25.04.2002 and first National Implementation Plan of the country was transmitted to the secretariat on 01.05.2006. Since amendments to the Convention were entered into force in 2009 and 2011, Germany prepared and submitted its second NIP to the secretariat in 2012. As compared to the NIP of the Czech Republic, NIP of Germany is more compact and briefly describes the status of the country and the actions to be implemented. Moreover, the progress made between the preparation of first and second NIPs were clearly stated in the second NIP. For this reason, NIPs of Germany exhibit good examples of NIPs and selected to be examined in this study.

2.5.2.1 First National Implementation Plan of Germany

The national and international legal frameworks related to POPs were represented simply in the NIP (NIP of Germany, 2006). The international agreements that Germany is a party are Stockholm Convention and POPs Protocol under CLRTAP. Also, EU Regulation (EC) No. 850/2004 on POPs is another international regulation on POPs that is in effect in Germany (Regulation (EC) no 850/2004 of the European Parliament and of the Council on Persistent Organic Pollutants and Amending Directive 79/117/EEC, 2004). It was stated in the NIP that, in order to determine what to do to comply with the requirements of these international agreements, German Ministry of Environment first held a meeting in 2004 with the participation of relevant industries' representatives, NGOs and governmental institutions. It was pointed out that the national legislations on chemicals were aligned with the EU regulations on chemicals management. The registration procedure of new chemical substances was summarized in the NIP. According to the information given, the registration of new chemical substances was subject to prior assessment due to the Chemicals Act (Act on the Protection Against Hazardous Substances, 1994). The producer of new chemicals had to submit data on the physical, chemical, toxicological and eco-toxicological properties of the substances. The institutions involved in the assessment process were State Institute of Occupational Safety and Health, Federal Institute for Risk Assessment and Federal Environment Agency.

Apart from that, the overview of the management of existing chemicals was provided in the NIP. The main legislative instrument for the management of existing chemicals was the Administrative Regulation for Existing Commercial Chemical Substances (1997). The evaluation of environmental and health effects of existing commercial chemicals is to be conducted according to this regulation. The involved institutions were State Institute of Occupational Safety and Health, Federal Institute for Risk Assessment and Federal Environment Agency. Apart from these regulations, the regulations on specific chemicals and wastes were also listed in the NIP. This information confirms that Germany has a strong and well defined legislative background for the management of POPs. Consequently, the needs for update and

revision in the national legislations have been set forth in the NIP, clearly. It was stated that (NIP of Germany, 2006);

- The provisions of the Article 3 of the Convention had already been integrated into the existing laws and regulations and therefore no further actions were defined regarding this article.
- The national legislations and EU IPPC Directive had been implemented to comply with the provisions of Article 5 of the Convention. Application of best available techniques and implementation of pollution release and transfer registers were expected to be effective on the control of emissions of Annex C chemicals.
- The obligations defined under Article 6 had been fulfilled and no further actions were needed.

Furthermore, information has been provided on the current research and monitoring activities in the NIP. It was emphasized that "Environmental Specimen Bank" had been established in the 1980s in Germany and environmental and human samples had been collected since that date in order to evaluate the environmental behavior and levels of pollutants in different compartments of the environment. Aldrin, dieldrin, heptachlor, HCB, PCBs, DDT, HCH, pentachlorobenzene, PCDD/Fs, PFOS and PBDEs are among the POPs which were analyzed in the collected samples. Apart from this, various monitoring activities have been conducted to determine the levels of pollutants in air, water, soil and sewage sludge. Also, Dioxin Database was built to collect and assess monitoring data on dioxins.

The national priorities specified for the implementation of Stockholm Convention have been listed in the NIP. These were:

- Identification of substances with persistent, bioaccumulative and toxic properties under the REACH regulation (EU Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals)
- Improvement of the operation of Environmental Specimen Bank in order to better evaluate the spatial and temporal trends in pollutant levels

- Developing new TEQs (Toxic equivalents) for PCDD/Fs by combining and improving the existing methods
- Implementation of BAT/BEPs in the industrial processes
- Reducing the emissions of unintentionally produced POPs (Annex C chemicals)
- Conducting a research project to determine the amount of unintentionally produced PCBs and HCB
- Controlling wastes contaminated with PCBs
- Improvement of Dioxin Database and providing public access to the information collected
- Extending the scope of existing environmental monitoring programs
- Contributing to the WHO monitoring studies on POPs in breast milk

The accountable institutions were Federal Environment Agency, State Institute of Occupational Safety and Health, Federal Institute for Risk Assessment, Federal Environment Agency and Federal Institute for Consumer Protection and Food Safety.

2.5.2.2 Second National Implementation Plan of Germany

Germany has updated and revised its NIP in order to comply with the amendments made to the Convention in 2009 and 2011 and later submitted their second NIP to the Convention secretariat in 2012. The second implementation plan includes the obligations which have already been fulfilled, the improvements in the actions defined in the first implementation plan and the requirements to comply with the provisions which have not been satisfied (NIP of Germany, 2012).

As in the first NIP, the legislative background was represented in the NIP. The international treaties like Basel, Rotterdam and CLRTAP and the amended EU regulations form the legal basis of the chemicals management in Germany together with the existing national regulations. Moreover, Strategic Approach for International Chemicals Management (SAICM) was also adopted by the country.

It was stated that provisions of the Article 3 on the elimination/restriction of use, manufacture, import and export of Annex A/B chemicals of the Convention has been

fulfilled. In order to eliminate and release the emissions unintentionally produced POPs in accordance with Article 5 of the Convention, the emission data has been collected by Federal Environment Agency and the measures has been determined by specific national regulations and EU directives. Accordingly, the application of BAT/BEPs was promoted. It was pointed out that the main requirement to fulfill the provisions of Article 6 was to ensure the irreversible transformation of the wastes contaminated with POPs.

Apart from these, it was revealed in the NIP that public awareness is of significant concern in Germany. German Environmental Information Portal is a website presenting all the environmental data easily to the public. The amount of pollutants released and transferred by the industries is represented by Pollution Release and Transfer Register Germany through the web. Additionally, Dioxin Database was improved and data on some other pollutants like PFOS, PBDE, PCBs and OCPs is also collected and stored in the database. Furthermore, the research and monitoring objectives determined in the first NIP has been achieved. Overall, it was observed that the objectives set forth in the first NIP have been achieved until the preparation of the second NIP.

CHAPTER 3

CURRENT FRAMEWORK IN TURKEY

Turkey signed the Stockholm Convention in 2001 and became a party on 12 January 2010. After 2010, as a party to the Convention, Turkey is obliged to comply with its requirements. The main responsibilities of Turkey due to the provisions of the Convention are the following (Stockholm Convention, 2001):

- Take the necessary measures to eliminate the production and use of chemicals listed in Annex A and restrict the production and use of chemicals listed in Annex B
- Take the necessary measures to ensure that the chemicals listed in Annex A or Annex B are imported only for environmentally soundly disposal or permitted purposes
- Ensure the disposal of the wastes contaminated with POPs in accordance with the Basel Convention
- Prepare and update the (NIP) in accordance with the provisions of the Convention
- Establish a monitoring system to determine the emissions of the POPs and take the inventories of those chemicals
- Promote the application of BATs/BEPs to reduce the emissions of POPs
- Identify the contaminated sites and ensure the remediation of these sites by applying appropriate methods
- Attend Conference of Parties

In order to evaluate Turkey's status in terms of compliance with the requirements of the Stockholm Convention, a thorough assessment of; (i) Turkish institutional

framework to lay down responsible institutions and their relationship to one another and (ii) Turkish legal framework and relevance with international laws and treaties is needed. For this purpose, this chapter focuses on the current institutional and legal framework in Turkey and the next chapter focuses on the gaps and deficiencies in the implementation and requirements to achieve full compliance with the Convention.

3.1 Institutional Framework

Ministry of Environment and Urbanization is the main responsible body for the implementation of the Stockholm Convention. However, since the implementation of the Convention requires collaborative and interdisciplinary efforts, several other governmental institutions take role in the implementation process. The institutions involved in the implementation of the Stockholm Convention and their roles in the implementation are given in Table 3.1:

Table 3.1: Relevant governmental institutions and their responsibilities

Institution	**Responsibilities Regarding the Stockholm Convention**
Ministry of Environment and Urbanization	Main accountable institution
Ministry of Food, Agriculture and Livestock	Control of the production, use and placing on the market of pesticides and the old stocks
Ministry of Forestry and Water Affairs	Deriving the quality standards for POPs in water and monitoring and control of pollution caused by POPs in water resources
Ministry of Science, Industry and Technology	Control of the production of chemicals
Ministry of Energy and Natural Resources	Control of the waste equipments containing PCBs
Ministry of Health	Controlling the health effects of POPs

Table 3.1 (Cont'd)

Institution	Responsibilities Regarding the Stockholm Convention
Ministry of Labor and Social Security	Determining the rules and principles of working with chemicals and the measures necessary for the prevention of industrial accidents
Ministry of Economy	Determining the regulatory principles of product safety, import and export of chemicals
Ministry of Customs and Trade	Control of the import and export of chemicals
Ministry of Development	Determining the strategies and policies of development and investment in the environmental sector
Ministry of Transportation, Maritime Affairs and Communications	Controlling the transport of the chemicals
Ministry of National Education	Conducting public awareness and education activities

Ministry of Environment and Urbanization (MEU) is responsible for coordination of all activities of other institutions related to management of POPs as well as conducting studies to fulfill the obligations under the Convention. Under MEU, this coordination is provided by the Department of Chemicals Management, which is under the Directorate General of Environmental Management.

3.1.1 On-going Activities of MEU on Management of POPs

Department of Chemicals Management currently conducts 2 projects on POPs. These projects are:

- Technical Assistance Project for the Implementation of EU Persistent Organic Pollutants Regulation
- POPs Legacy Elimination and POPs Release Reduction Project

By Technical Assistance Project for the Implementation of EU Persistent Organic Pollutants Regulation, it is expected to determine the gaps in legislation and EU POPs Regulation will be fully harmonized.

On the other hand, the objective of the POPs Legacy Elimination and POPs Release Reduction Project is to dispose of old environmental burdens and develop strategies to control the releases of POPs.

In scope of these two projects, an important progress is expected to be made on review and update of the national legislation and control of POPs release.

Moreover, NIP Update and Review Project was completed in February 2014 and the draft NIP was prepared and will be transmitted to the Convention secretariat after revision and approval.

3.2 Legal Framework

There are several international agreements, EU regulations and national legislations providing the legal basis to the management of POPs. Some of them directly address the issues related to POPs management while others are related to the chemicals and waste management policy of Turkey. However, none of these legislations covers the management of POPs as a whole. The specifics of the legal framework are discussed under international and national categories in the following sections.

3.2.1 International Agreements and Legislation

Stockholm Convention is the international treaty governing the management of POPs. In addition to this, Basel Convention and Rotterdam Convention are multilateral environmental agreements related to the management of hazardous substances. Basel Convention was adopted in 1989 and governs the disposal and transboundary movement of hazardous wastes. Rotterdam Convention was adopted in 1998 and governs prior informed consent procedure for the international trade of certain hazardous chemicals and pesticides. Some provisions of the Stockholm Convention on management of POPs wastes are related to the provisions of Basel Convention. Turkey is a party to the Basel Convention since 1994. On the other

hand, Turkey signed the Rotterdam Convention in 1998 but still not a party to the Convention.

Apart from these multilateral environmental agreements, there are a number of EU regulations on POPs. In the EU accession process, Turkey has to harmonize those regulations related to POPs that were not already adopted. All EU regulations relevant to POPs are listed in Table 3.2:

Table 3.2: EU regulations related with POPs

Regulation	**Number & Date**	**Scope**	**Related Turkish Regulations**
Industrial Emissions Directive	2010/75/EU 24.11.2010	Preventing, reducing and eliminating pollution with an integrated approach	-
Council Directive on the Disposal of Polychlorinated Biphenyls and Polychlorinated Terphenyls	96/59/EC 16.09.1996	Disposal of polychlorinated biphenyls and polychlorinated terphenyls	By-law on the Control of Polychlorinated Biphenyls and Polychlorinated Terphenyls
Regulation on Export and Import of Dangerous Chemicals	689/2008 17.06.2008	Control of export and import of certain dangerous chemicals	By-law on the Inventory and Control of Chemicals
Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)	1907/2006 18.12.2006	Regulating the registration, restriction and certification of the chemicals	By-law on Inventory and Control of Chemicals, By-law on Classification, Packaging and Labeling of Dangerous Substances and Preparations

Table 3.2 (Cont'd)

Regulation	Number & Date	Scope	Related Turkish Regulations
Council Regulation on Persistent Organic Pollutants and Amending Directive 79/117/EEC	850/2004/EC 29.04.2004	Providing legal basis for the control of production, use and placing on the market of POPs listed in the Convention and Aarhus Protocol and minimization of the releases of these pollutants to the environment	-

3.2.2 National Legislation

There are numerous national legislations regarding management of chemicals and wastes, production of pesticides, control of import of products. These legislative instruments were listed based on their relevance to management of POPs and provisions of the Stockholm Convention and grouped according to their aim and scope in the following tables. For by-laws and notifications, date and number indicates the date and number of the Official Gazette in which the regulation was published. The complete list of the legislations without any classification is given in Appendix.

Table 3.3: National legislations on chemicals management

Environmental Law	
Date and Number	11.08.1983/2872
Implementing Institution	Council of Ministers (Ministry of Environment and Urbanization)

Table 3.3 (Cont'd)

Relevance with the POPs management	Article 2 of the law provides the definition hazardous waste. Article 13 of the law sets principles for the manufacturing, use, storage, transportation, import and export of hazardous chemicals and management of hazardous wastes by referring to the related regulations. Moreover, it is stated that Ministry of Economy can prohibit or restrict the import of certain chemicals, products and wastes by consulting the Ministry of Environment and Urbanization. The law appoints administrative fines for the case of violation of the provisions.
Relevant EU Regulation or International Agreement	-
Law on the Approval of Ratification of the Stockholm Convention	
Date and Number	02.04.2009/5871
Implementing Institution	Council of Ministers (Ministry of Environment and Urbanization)
Relevance with the POPs management	The law states that the ratification of Stockholm Convention by Turkey was approved.
Relevant EU Regulation or International Agreement	Stockholm Convention
By-law on Control of PCB and PCTs	
Date and Number	27.12.2007 /26739
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management

Table 3.3 (Cont'd)

Relevance with the POPs management	Setting methods and principles of disposal of PCB containing equipments and prohibits the production and import of PCBs
Relevant EU Regulation or International Agreement	96/59/EC (Directive on Disposal of PCBs and PCTs)
By-law on Inventory and Control of Chemicals	
Date and Number	26.12.2008/27092
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management
Relevance with the POPs management	Gathering and presentation of data on production and import of chemicals and control of the associated risk caused by chemicals
Relevant EU Regulation or International Agreement	1907/2006 (REACH)
By-law on Classification, Packaging and Labeling of Dangerous Substances and Preparations	
Date and Number	26.12.2008/27092
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management
Relevance with the POPs management	Management and control of classification, packaging and labeling of hazardous substances on the market with the aim of ensuring the protection of environment and human health and establishment of "Chemicals Advisory Board" to follow up the implementation of the by-law

Table 3.3 (Cont'd)

Relevant EU Regulation or International Agreement	67/548/EEC (CLP), 2006/121, 1907/2006 (REACH)
By-law on Compilation and Distribution of Safety Data Sheets for Hazardous Substances and Preparations	
Date and Number	26.12.2008/27092
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management
Relevance with the POPs management	Principles of compilation and distribution of material safety data sheets to protect the environment and human health
Relevant EU Regulation or International Agreement	1907/2006 (REACH)
By-law on Restriction of Manufacturing, Placing on the Market and Use of Certain Hazardous Substances, Preparations and Articles	
Date and Number	26.12.2008/27092
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management
Relevance with the POPs management	Restricts and prohibits the production, use and placing on the market of PCBs and PBBs
Relevant EU Regulation or International Agreement	1907/2006 (REACH)

Table 3.3 (Cont'd)

By-law on Cosmetics	
Date and Number	23.05.2005/25823
Implementing Institution	Ministry of Health/ Medicine and Medical Devices Institution
Relevance with the POPs management	The article 7 of the regulation prohibits the use of α-HCH in cosmetic products.
Relevant EU Regulation or International Agreement	76/768/EEC (Directive on Cosmetic Products), 96/335/EC (Commission Decision of establishing an inventory and a common nomenclature of ingredients employed in cosmetic products)
Notification on Auditing of Import of Chemicals that are Controlled for Environmental Protection	
Date and Number	31.12.2013/28868
Implementing Institution	Ministry of Economy/ Directorate General of Product Safety and Inspection
Relevance with the POPs management	The import of chemicals listed in Annex II of the notification including PCBs and PBBs is banned.
Relevant EU Regulation or International Agreement	-
By-law on the Prevention and Reduction of the Effects of Major Industrial Accidents	
Date and Number	30.12.2013/28867
Implementing Institution	Ministry of Labor and Social Security/ Directorate General of Occupational Health and Safety Ministry of Environment and Urbanization/ Directorate General of Environmental Impact Assessment, License and Inspection

Table 3.3 (Cont'd)

Relevance with the POPs management	Methods and principles concerning the necessary measures to ensure the efficient and continual prevention of the major industrial accidents in the facilities in which PCDD/Fs can be formed as by-products of processes
Relevant EU Regulation or International Agreement	96/82/EC (Seveso II Directive)

Table 3.4: National legislations on management of pesticides

Law on Veterinary Services, Plant Health, Food and Feed	
Date and Number	11.06.2012/5996
Implementing Institution	Council of Ministers (Ministry of Food, Agriculture and Livestock)
Relevance with the POPs management	Sets forth the principles of production, import, use, packaging, labeling, transport, storage, certified or non-certified sale, certification, control and supply of pesticides and provides the legal basis for the relevant by-laws
Relevant EU Regulation or International Agreement	-
By-law on Control of Pesticides	
Date and Number	20.05.2011/27939
Implementing Institution	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control/ Department of Pesticides

Table 3.4 (Cont'd)

Relevance with the POPs management	Article 36 of the by-law states that the production, import and sale of the pesticides whose certificates are invalidated is ceased out. The prohibition and phasing out of the pesticides which have been listed or will be listed by the Stockholm Convention as POP is fulfilled in the scope of this by-law.
Relevant EU Regulation or International Agreement	-
By-law on the Certification of Pesticides	
Date and Number	25.03.2011/27885
Implementing Institution	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control/ Department of Pesticides
Relevance with the POPs management	Article 22 of the regulation states that the certificates of the pesticides which have been prohibited by the international organizations/institutions are cancelled out by the Ministry of Food, Agriculture and Livestock and this is the first step in the prohibition process of the pesticides listed by the Convention as POP.
Relevant EU Regulation or International Agreement	-
By-law on Sale and Storage of Pesticides	
Date and Number	10.03.2011/27870
Implementing Institution	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control/ Department of Pesticides

Table 3.4 (Cont'd)

Relevance with the POPs management	Prohibiting the sale of POP pesticides due to the provisions of Article 15
Relevant EU Regulation or International Agreement	-

Table 3.5: National legislation on management of POPs wastes

By-law on Control of Hazardous Wastes	
Date and Number	14.03.2005/25755
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Ensuring the environmentally soundly management of hazardous wastes (including wastes contaminated with PCB, PCDD/Fs) by minimizing at source and preventing the adverse effects on human health and environment of wastes
Relevant EU Regulation or International Agreement	Basel Convention 91/689/EEC (Council Directive on Hazardous Wastes)
By-law on Control of Waste Oils	
Date and Number	30.07.2008/26952
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Limiting the PCB content of the waste oils, prevention of the incineration of PCB containing oils and ensuring the environmentally soundly disposal of PCB containing waste oils

Table 3.5 (Cont'd)

Relevant EU Regulation or International Agreement	2008/98/EC (Waste Framework Directive), 75/439/EC (Directive on Disposal of Waste Oils)
By-Law on Control of Waste Electrical and Electronic Equipments	
Date and Number	22.05.2012/28300
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Determines the principles of disposal of waste electrical and electronic equipments containing PCBs, PBBs and PBDEs and prohibits the production and import of electrical and electronic equipments containing PBBs and PBDEs
Relevant EU Regulation or International Agreement	2002/95/EC (Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipments), 2002/96/EC (Directive on Waste Electrical and Electronic Equipments)
By-law on the General Principles of Waste Management	
Date and Number	05.07.2008/26927
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Determines the general principles of management of wastes from cradle to grave
Relevant EU Regulation or International Agreement	2008/98/EC (Waste Framework Directive)

Table 3.5 (Cont'd)

By-law on Landfill of Wastes	
Date and Number	26.03.2010/27533
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Sets down the rules for the storage of wastes contaminated with PCBs
Relevant EU Regulation or International Agreement	1999/31/EC (Landfill of Waste)
By-law on the Incineration of Wastes	
Date and Number	06.10.2010/27721
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management
Relevance with the POPs management	Sets out the principles of incineration of some wastes like PCBs and hazardous wastes
Relevant EU Regulation or International Agreement	2000/76/EC (Incineration of Waste)

Table 3.6: National legislations setting the discharge and ambient quality standards for POPs

Turkish Food Codex By-law on Contaminants	
Date and Number	29.12.2011/28157
Implementing Institution	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control

Table 3.6 (Cont'd)

Relevance with the POPs management	Determining the allowable limit values for PCDD/Fs and dioxin like PCBs in foodstuffs
Relevant EU Regulation or International Agreement	1881/2006/EC (Directive on Setting Maximum Levels for Certain Contaminants in Foodstuffs)
By-law on Control of Pollution Caused by Dangerous Substances in Aquatic Environment	
Date and Number	26.11.2005/26005
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Water and Soil Management
Relevance with the POPs management	Determination of discharge and water quality standards for certain POPs (DDT, hexachlorocyclohexane, aldrin, dieldrin, endrin, hexachlorobenzene, endosulfan) and aiming the control the discharges of these pollutants
Relevant EU Regulation or International Agreement	76/464/EEC (Directive on Water Pollution by Discharges of Certain Dangerous Substances)
By-law on Control of Soil Pollution and Sites Contaminated by Point Sources	
Date and Number	08.06.2010/27605
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Water and Soil Management

Table 3.6 (Cont'd)

Relevance with the POPs management	Determines the methods and principles of detection of the sites contaminated or potentially contaminated by POPs and remediation and monitoring of these sites in line with the sustainable development goals, defines generic limit values for certain POPs in soil (aldrin, DDT, dieldrin, endosulfan, endrin, α-HCH, β-HCH, lindane, hexachlorobenzene, heptachlor, pentachlorobenzene, PCB, toxaphene, PCDD)
Relevant EU Regulation or International Agreement	-
By-Law on Surface Water Quality Management	
Date and Number	30.11.2012/28483
Implementing Institution	Ministry of Forestry and Water Affairs/ Directorate General of Water Management/ Department of Water Quality Management
Relevance with the POPs management	Determining the limit values in water (environmental quality standards) for POPs by 2015 and reveals the vitality of monitoring of POPs in water and sediment
Relevant EU Regulation or International Agreement	2000/60/EC (Water Framework Directive), 2008/105/EC (Environmental Quality Standards Directive)
By-law on Control of Air Pollution Arising from Industrial Facilities	
Date and Number	03.07.2009/27277
Implementing Institution	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Air Management and Climate Change

Table 3.6 (Cont'd)

Relevance with the POPs management	Control the emissions of POPs from industrial facilities, sets down restrictions and limit values for emissions of PCDD/Fs and PCBs
Relevant EU Regulation or International Agreement	2010/75/EU (Integrated Pollution Prevention and Control Directive)

CHAPTER 4

METHODOLOGY

The main approach followed throughout this study is to conduct a gap analysis in order to determine the needs for full compliance with the requirements of the Stockholm Convention. Gap analysis can be simply defined as the determination of the needs to achieve a desired status. For this purpose, it is crucial to determine the current state and the objective to be achieved, initially. After that, the actions required to achieve the objective can be put forth easily by comparing the current state and the future state to be reached.

In this study, the objective status was designated as achievement of full compliance with requirements of the Stockholm Convention. In order to reveal the needs for achieving the stated objective, current status of Turkey was presented. In this scope, institutional and legal framework in Turkey pertaining to POPs and Stockholm Convention was evaluated. Furthermore, the gaps in implementation of the Convention were identified by comparing the provisions of the Convention with the existing legislation and current practices individually. In addition to this, the actions defined in the NIP of Turkey were assessed by comparing to good examples of NIP and obligations of the Convention. Moreover, the outcomes of these evaluations were reviewed comparatively and overall recommendations were provided on the measures to be taken. The methodology applied in this study is represented in Figure 1.

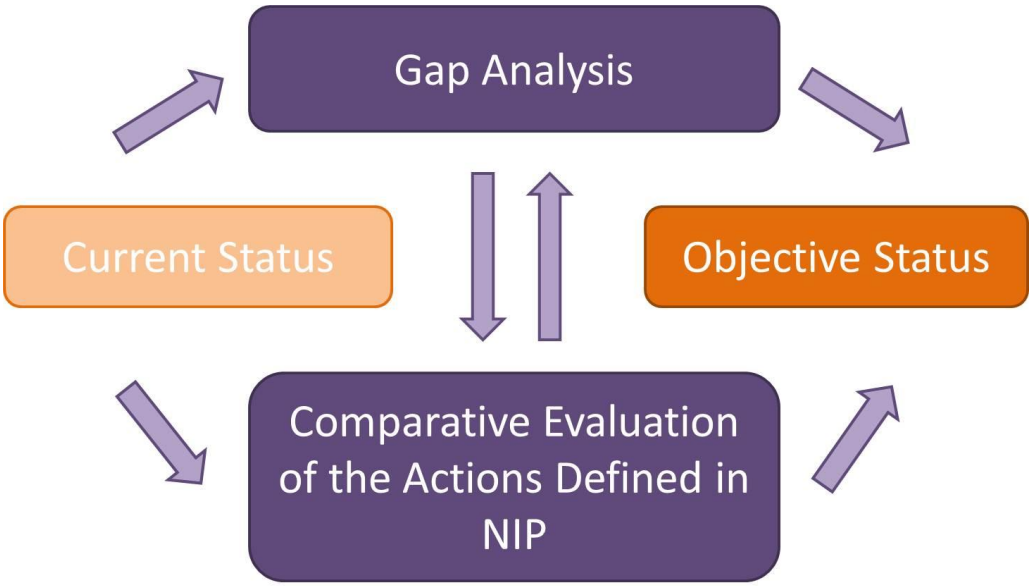

Figure 4.1: The methodology applied in the study

CHAPTER 5

GAP ANALYSIS

The requirements of the Stockholm Convention were defined by the provisions of the Convention. In order to represent Turkey's status of in terms of compliance with these requirements, a gap analysis was conducted. The status of Turkey was evaluated comprehensively by comparing the requirements of Convention individually with the provisions of the existing relevant national legislations and governmental practices. Consequently, gaps in implementation of the Stockholm Convention were put forth. The gap analysis is given in Table 4.1:

Table 5.1: Evaluation of the current status of Turkey in terms of compliance with the requirements of the Convention

Article	**No**	**Requirement**		**Responsible Institution**	**Fulfillment**	**Related Legislation**	**Gaps**
3	**1.a**	Prohibit and/or take the legal and administrative measures necessary to eliminate	**i.** production and use of the chemicals listed in Annex A	MEU (industrial chemicals) MH (industrial chemicals)	Prohibition of the manufacture and use of PCBs and hexabromobiphenyl Prohibition of the production of electrical and electronic equipments containing hexabromobiphenyl and PBDEs (with some exceptions) Prohibition of the production of PCBs	By-law on Restriction of Manufacturing, Placing on the Market and Use of Certain Hazardous Substances, Preparations and Articles By-law on Control of Waste Electrical and Electronic Equipments	Production and industrial use of PBDEs, hexachlorobenzene and hexabromocyclododecane are not prohibited by legal instruments.

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
					Prohibition of the use of α-HCH in cosmetic products	By-law on Control of PCBs and PCTs By-law on Cosmetics	
				MFAL (pesticides)	Elimination of use of pesticides in Annex A	By-law on the Certification of Pesticides By-law on Sale and Storage of Pesticides By-law on	Although the regulations state that the certificates of the pesticides which have been banned by the international agreements/organizations are invalidated, the mechanism of prohibition of the production is not specified. In what frequency the prohibited pesticides list is revised?

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
						Control of Pesticides	
			ii. import and export of the chemicals listed in Annex A	MEU (industrial chemicals) ME (industrial chemicals)	Prohibition of the import of PCBs Prohibition of the import and export of wastes containing POPs Prohibition of the import of electrical and electronic equipments containing hexabromobiphenyl and PBDEs in (with some exceptions)	By-law on Control of PCBs and PCTs By-law on Control of Hazardous Wastes By-law on Control of Waste Electrical and Electronic Equipments	The import and export of PBDEs and hexabromocyclododecane as pure chemicals are not prohibited by the legislations. There is no regulation controlling the export of Annex A industrial chemicals. However, the export of wastes containing these chemicals is prohibited. The only legal instrument on the export of products is "Regulation on Export". The regulation states that the export of products

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
					Prohibition of the import of PCBs and hexabromobiphenyl	Notification on Auditing of Import of Chemicals that are Controlled for Environmental Protection	whose export is subject to prior consent due to the international agreements is controlled.
				MFAL (pesticides)	Elimination of the import of pesticides in Annex A	By-law on Control of Pesticides	The export of POP pesticides is not regulated.
3	**1.b**	Restrict the production and use of the chemicals listed in Annex B		MEU	-	-	The production and use of PFOS are not regulated.
				MFAL	Elimination of the production and use of DDT	By-law on the Certification of Pesticides	-

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
						By-law on Control of Pesticides	
3	**2.a**	Take the necessary measures to ensure that a chemical listed in Annex A or Annex B is imported only	i. for the purpose of environmentally sound disposal	MEU MFAL	Prohibition of the import of wastes containing POPs unless they can be used as raw materials in the production processes Prohibition of the import of PCBs Prohibition of the import of POP pesticides	By-law on Control of Hazardous Wastes By-law on Control of PCBs and PCTs By-law on Control of Pesticides	Although the import of POPs containing wastes is regulated, there is no regulatory instrument covering the import of POPs other than PCBs as pure chemicals or products.
			ii. for a use or purpose which is permitted for that Party under Annex A or Annex B				

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
3	**2.b**	Take measures to ensure that a chemical listed in Annex A or B for which production or use specific exemptions and/or acceptable purpose are in effect is exported only	i. for the purpose of environmentally sound disposal	MEU MFAL	Ensuring that the wastes containing POPs are export only for the purpose of environmentally soundly disposal	By-law on Control of Hazardous Wastes	The export of POPs as pure chemicals or products is not regulated.
			ii. to a party which is permitted to use that chemical				
			iii. to a nonparty state by ensuring the environmental protection				
3	**2.c**	Take measures to ensure that a chemical listed in Annex A for which production or use specific exemptions are no longer in effect for any party is not exported from it except for the purpose of environmentally soundly disposal		MEU MFAL	Ensuring that the wastes containing POPs are export only for the purpose of environmentally soundly disposal	By-law on Control of Hazardous Wastes	The export of POPs as pure chemicals or products is not regulated.

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
3	**3&4**	Take measures to regulate the production and use of new industrial chemicals/pesticides which exhibit the characteristics of persistent organic pollutants		MEU MFAL	The production of new pesticides is controlled.	By-law on Certification of Pesticides	The production of new industrial chemicals is not controlled by legal instruments. The information required for the process of certification of pesticides does not cover the physicochemical properties, bioaccumulation potential and ecotoxicological data. The list must be revised.
5	**a**	Develop an action plan to identify, characterize and address the release of Annex	**i.** evaluation of the current and projected releases; source inventory and release estimates	MEU	-	-	There is no action plan in Turkey regarding the control of emissions of Annex C chemicals. On the other hand, the emissions of PCDD/F emissions from industrial

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
		C chemicals including;	**ii.** evaluation of the effectiveness of the existing legislation				facilities are restricted by By-law on Control of Air Pollution Arising from Industrial Facilities.
			iii. strategies to meet the obligations of the Convention				
			iv. awareness raising activities				
			v. periodic review of the activities				
			vi. a schedule for the implementation of the action plan				

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
5	**b**	Promote the application of available, feasible and practical measures to reduce the releases		MEU	-	-	There is no action or plan to promote the application of measures.
5	**c**	Promote the development and use of substitute materials to prevent the formation of Annex C chemicals		MEU	-	-	There is no action or plan to promote the application of measures.
5	**d, e**	Promote the use of best available techniques and best environmental practices to control and eliminate the production and releases of Annex C chemicals		MEU	-	-	There is no action or plan to promote the application of measures.
6	**1.a**	Develop appropriate strategies for identifying	**i.** stockpiles containing Annex A/B chemicals	MEU MFAL	-	By-law on General Principles of Waste Management	Although some of the stockpiles have been controlled and a project has been initiated on the control of POPs stockpiles and emissions, there

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
						By-law on Control of PCBs and PCTs	isn't strategy or plan developed to identify the stockpiles.
			ii. products and articles in use and wastes containing Annex A/B/C chemicals	MEU MFAL	-	By-law on Control of PCBs and PCTs By-law on the General Principles of Waste Management	By-law on Control of PCBs and PCTs states provisions on the inventory of PCB containing equipments and wastes. The ministry developed an inventory system for PCBs. However, the system is not in use currently. On the other hand, By-law on the General Principles of Waste Management requires the identification of characteristics of the wastes

Table 5.1 (Cont'd)

Article	No	Requirement	Responsible Institution	Fulfillment	Related Legislation	Gaps
						which are given in the Annex III A of the by-law. But, these requirements are not adequate to determine whether a waste contains POPs or not. There is not a comprehensive strategy or plan or legislation allowing the identification of POPs containing products and wastes.
6	**1.b**	Identification of the stockpiles of Annex A/B chemicals	MEU MFAL	Some of the old stockpiles have been identified. There is an ongoing project on the identification and disposal of stockpiles.	-	The activities are not conducted according to a plan or strategy. Individual projects or studies are conducted.

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
6	**1.c**	Manage stockpiles in an environmentally soundly manner		MEU	The old stockpiles have been disposed in environmentally soundly manner.	-	There is no legislation covering the disposal of POPs stockpiles.
6	**1.d**	Take measures to ensure that POPs containing wastes are	**i.** handled, collected, transported and stored in an environmentally soundly manner	MEU	The principles are stated by the By-law on Control of Hazardous Wastes for the control of hazardous wastes not specifically for all POPs, only PCBs, PCDD/Fs are included.	By-law on General Principles of Waste Management By-law on Control of Hazardous Wastes	The hazardous waste categories given in the Annex III A of By-law on Control of Hazardous Wastes does not include all the POPs. Therefore, the Annex III A of the by-law should be updated.
			ii. disposed appropriately or environmentally soundly considering the international regulations on hazardous waste				

Table 5.1 (Cont'd)

Article	No	Requirement		Responsible Institution	Fulfillment	Related Legislation	Gaps
			management				
			iii. not permitted to be disposed of in such a way that can be resulted in the recovery, reuse, recycling and reclamation of the POPs				
			iv. not transported across international boundaries without considering the international rules and regulations				

Table 5.1 (Cont'd)

Article	No	Requirement	Responsible Institution	Fulfillment	Related Legislation	Gaps
6	**1.e**	Endeavour to develop appropriate strategies to identify the contaminated sites	MEU	By-law on Control of Soil Pollution and Sites Contaminated by Point Sources sets forth the principles of identification of the contaminated sites and "Contaminated Sites Information System" has been developed accordingly.	By-law on Control of Soil Pollution and Sites Contaminated by Point Sources	"Contaminated Sites Information System" is not in use and there is not a system to identify contaminated sites and no control mechanism has been developed.
7	**1**	Develop, update an review a national implementation plan in line with the provisions of the Convention	MEU	First national implementation plan has been submitted to the secretariat in 2011 and the second NIP will be submitted this year.	-	-

Table 5.1 (Cont'd)

Article	No	Requirement	Responsible Institution	Fulfillment	Related Legislation	Gaps
7	**3**	Integrate national implementation plans in sustainable development strategies of the company	MEU	-	-	Turkey does not have a chemicals management policy and the activities listed in the NIP have not been taken into account when determining the development strategies.
9	**1**	Undertake information exchange on reduction/elimination of the production, use and release of POPs and alternatives of POPs	MEU	-	-	Turkey does not have specific information on the elimination/reduction of production, use and releases of POPs since the scientific studies and governmental efforts are limited.
10	**1**	Enhance the awareness of public and decision makers on POPs issue	MEU	-	-	There is no awareness enhancing activity.

Table 5.1 (Cont'd)

Article	No	Requirement	Responsible Institution	Fulfillment	Related Legislation	Gaps
10	**5**	Develop mechanisms to collect information on estimates of annual quantities of POPs like pollutant release and transfer registers	MEU MSIT	-	-	Turkey does not have a PRTR (Pollutant release and transfer register) system.
11	**1**	Encourage research, development and monitoring activities on POPs	All related governmental institutions	Although they are not specific to POPs, Turkish Scientific and Technical Research Council provides support to research activities.		The actions required to implement the Convention are not included in the national programs.
15	**1**	Report to the Conference of Parties on the measures taken to implement the Convention and the effectiveness of these measures	MEU MH	-	-	There is no reporting mechanism regarding the implementation of the Convention.

Table 5.1 (Cont'd)

Article	No	Requirement	Responsible Institution	Fulfillment	Related Legislation	Gaps
15	**2**	Provide statistical data to the secretariat on the production, import, export of POPs	MEU	-	-	There is not a permanent inventory system to collect data on the production, use, import and export of POPs.
16	**2**	Conduct monitoring studies to obtain meaningful data for evaluating the effectiveness of the Convention	MEU MH MFWA	-	-	The monitoring studies conducted in Turkey are not representative and organized. Most of them are limited to specific places and the duration of monitoring is not sufficient. Turkey has to develop a comprehensive monitoring plan and be a part of global or regional monitoring activities conducted by international organizations.

The outcomes of the gap analysis are summarized in the following list. The article of the Convention regarding each gap is given in parentheses. These outcomes represent both the regulatory gaps and the gaps in practices:

Gap 1 (Article 3.1.a.i): Production and industrial use of PBDEs, hexachlorobenzene and hexabromocyclododecane are not prohibited by legal instruments.

Gap 2 (Article 3.1.a.i): Although the regulations state that the certificates of the pesticides which have been banned by the international agreements/organizations are invalidated, the mechanism of prohibition of the production is not specified. In what frequency the prohibited pesticides list is revised?

Gap 3 (Article 3.1.a.ii): The import and export of PBDEs and hexabromocyclododecane as pure chemicals are not prohibited by the legislations.

Gap 4 (Article 3.1.a.ii): There is no regulation controlling the export of Annex A industrial chemicals. However, the export of wastes containing these chemicals is prohibited. The only legal instrument on the export of products is "Regulation on Export". The regulation states that the export of products of which export is subject to prior consent due to the international agreements is controlled.

Gap 5 (Article 3.1.a.ii): The export of POP pesticides is not regulated.

Gap 6 (Article 3.2.a): The production and use of PFOS are not regulated.

Gap 7 (Article 3.2.a): Although the import of POPs containing wastes is regulated, there is no regulatory instrument covering the import of POPs other than PCBs and hexabromobiphenyl as pure chemicals or products.

Gap 8 (Article 3.2.b/c): The export of POPs as pure chemicals or products is not regulated.

Gap 9 (Article 3.3-3.4): The production of new industrial chemicals is not controlled by legal instruments.

Gap 10 (Article 3.3-3.4): The information required in the process of certification of pesticides does not cover the physicochemical properties, bioaccumulation potential and ecotoxicological data. The list must be revised.

Gap 11 (Article 5.a): There is no action plan in Turkey regarding the control of emissions of Annex C chemicals. On the other hand, the emissions of PCDD/Fs from industrial facilities are restricted by By-law on Control of Air Pollution Arising from Industrial Facilities.

Gap 12 (Article 5.b/c/d/e): There is no action or plan to promote the application of measures.

Gap 13 (Article 6.1.a.i): Although some of the stockpiles have been controlled and a project has been initiated by Ministry of Environment and Urbanization (POPs Legacy Elimination and POPs Release Reduction Project) on the control of POPs stockpiles and emissions, there is not a strategy or plan developed to identify the stockpiles.

Gap 14 (Article 6.1.a.ii): By-law on Control of PCBs and PCTs states provisions on the inventory of PCB containing equipments and wastes. The ministry developed an inventory system for PCBs. However, the system is not in use currently.

Gap 15 (Article 6.1.a.ii): By-law on the General Principles of Waste Management requires the identification of characteristics of the wastes which are given in the Annex III A of the by-law. But, these requirements are not adequate to determine whether the wastes contain POPs or not.

Gap 16 (Article 6.1.a.ii): There is not a comprehensive strategy or plan or legislation allowing the identification of POPs containing products and wastes.

Gap 17 (Article 6.1.b): The activities are not conducted according to a plan or strategy. Individual projects or studies are conducted. Projects are always aimed at initiating certain efforts for the fulfillment of the requirements of the Stockholm Convention. Unless sustainable mechanisms are established during these projects, efforts do not result in achievement of long term goals.

Gap 18 (Article 6.1.c): There is no legislation covering the disposal of POPs stockpiles.

Gap 19 (Article 6.1.d): The hazardous waste categories given in the Annex III of By-law on Control of Hazardous Wastes does not include all the POPs. Therefore, the Annex III of the by-law should be rearranged.

Gap 20 (Article 6.1.e): "Contaminated Sites Information System" is not in use currently and there is no existing system to identify contaminated sites and no control mechanism has been developed.

Gap 21 (Article 7.3): Turkey does not have a chemicals management policy and the activities listed in the NIP have not been taken into account when determining the development strategies and national programs.

Gap 22 (Article 9.1): Turkey does not have specific information on the elimination/reduction of production, use and releases of POPs since the scientific studies and governmental efforts are limited.

Gap 23 (Article 10.1): There is not a plan for conducting awareness enhancing activities.

Gap 24 (Article 10.5): Turkey does not have a PRTR system.

Gap 25 (Article 11.1): The actions required to implement the Convention are not included in the national plans.

Gap 26 (Article 15.2): There is not a permanent inventory system to collect data on the production, use, import and export of POPs.

Gap 27 (Article 16.2): There is no proper POPs monitoring study in Turkey. Those studies involving POPs measurements in different media (soil, water, air or mother's milk) are not representative, long term or with enough geographical distribution. Most of them are limited to specific regions and the duration is not sufficient. Turkey has to develop a comprehensive monitoring plan and be a part of global or regional monitoring activities conducted by Stockholm Convention Regional Centers and other international organizations.

CHAPTER 6

COMPARATIVE EVALUATION OF THE ACTIVITIES LISTED IN CURRENT NIP

First official NIP of Turkey was submitted to the secretariat in 2011. However, studies on preparation of the NIP started in 2005. A draft document was published in 2006 and this draft was reviewed and updated. The national profile, legal and institutional background, scientific studies conducted in Turkey on POPs and governmental efforts on management of POPs were stated in NIP. Moreover, national priorities and actions to be taken to fulfill the obligations of the Convention were represented. There are 17 main activity groups defined in NIP.

In this section, the actions defined in NIP of Turkey were evaluated by making use of the outcomes of gap analysis conducted and comparing to good practices of the Czech Republic and Germany. The deficiencies and inappropriate wordings of the actions were specified. Furthermore, some recommendations were provided on the definition and implementation of the actions. The aim of this assessment is to reveal the progress made in the implementation of the Convention, to determine the shortcomings of the defined actions and specify the required actions.

Action 1: Institutional and Regulatory Measures

Fifteen actions are defined under this main action category. The main aim of this action is to strengthen the institutional and regulatory capacity of Turkey related to the implementation of Stockholm Convention. The sub-actions are discussed below.

Action 1.1 Defining the current institutional infrastructure and the governmental practices: The aim is to reveal the current state of the relevant institutions and their role in implementation.

Time frame: 5 years

Evaluation and Deficiencies: In order to fulfill the requirements of the Convention appropriately, the institutional and regulatory framework must be presented and the obligations of all the relevant institutions must be addressed simply. The time frame foreseen for this action in the NIP is 5 years. However, a 5-year period is not needed for such an evaluation study. Moreover, this evaluation must be included in the NIP.

Recommendations: The infrastructure of the relevant institutions must be evaluated comprehensively as a short term activity. As mentioned above, this evaluation must be included in the NIP since it will provide the basis of the implementation of SC. Furthermore, current legal framework must be evaluated concurrently. Conducting a legal and institutional gap analysis would be an appropriate methodology which reveals the gaps and overlaps in the institutional and legal framework.

Action 1.2 Accepting the EU POPs Regulation: The aim is to fully harmonize the EU POPs regulation and fill the gaps in the legal framework.

Time frame: 2 years

Evaluation and Deficiencies: The time frame of this action is defined as 2 years in the NIP. After defining the gaps in the legal framework via a legal gap analysis, the required revisions must be carried out or new regulations must be developed under Action 1.2. Accordingly, this action must not be limited to the harmonization of related EU regulations.

Recommendations: All the related laws and regulations must be revised considering the outcomes of the legal and institutional gap analysis in a period of 2 years. The ministries should analyze the obligations of the Convention appropriately while revising the regulations.

Action 1.3 Improvement of the coordination between the relevant institutions: It is aimed to improve the information and experience sharing mechanisms and distribute the responsibilities to enhance the implementation of the Convention.

Time frame: 2 years

Evaluation and Deficiencies: It is crucial to provide an effective coordination mechanism between the institutions to implement the Convention appropriately. The time frame is given as 2 years in the NIP. However, this must be a permanent action.

Recommendations: A permanent coordination mechanism like a coordination committee must be constituted and information sharing protocols must be signed between the institutions. Moreover, the political instability of Turkey might cause radical changes in the structures of the institutions. Such changes in the structure of the ministries may slow down the ongoing works or result in a change in the policy. The measures to be taken in order to minimize the effects of structural or policy changes in the institutions may be revealed via a SWOT analysis that will be included in the NIP.

Action 1.4 Establishment of a permanent expert network or expert groups responsible for the implementation of the Convention: The aim is to ensure the effective implementation of the Convention. This action is also directly related to the abovementioned actions.

Evaluation and Deficiencies: It is not possible to implement such a comprehensive Convention only via decentralized expert networks. A unifying body is necessary to centralize and control the efforts.

Recommendations: Turkey must construct a well-processing system like in the Czech Republic and Germany. The expert networks may be work as sub groups of the coordination committee and all may be assigned different responsibilities like control and coordination of legislative efforts, coordination of the inventory activities, etc.

Action 1.5 Improving the capacity of staff and the technical infrastructure and updating the national POP inventory by legislations: The aim is to strengthen the technical infrastructure and capacity of the staff and update the POPs inventory.

Time frame: 3 years

Evaluation and Deficiencies: MEU organizes some meetings and seminars to improve the capacity. But, the inventory of POPs is one of the most challenging steps of the implementation of the Convention and it must be discussed as another main action category.

Recommendations: It is obvious that the inventory is directly related with the institutional and legal issues. However, these two must be revised regarding the needs to constitute an efficient inventory system. There is not any legal instrument controlling the use of chemicals in Turkey. It is urgent to develop a policy and a comprehensive regulation on the control of manufacture, use, import and export of chemicals and these studies can be conducted while revising the regulations. Moreover, capacity of staff in headquarters and provincial organizations must be improved and a permanent mechanism must be established to ensure the effective implementation of regulations and the inventory system to be constituted. In addition to this, representatives of industries must be involved in the process of constituting an inventory system.

Action 1.6 Unifying the UNIDO activities' approach and EU Legislations: The objective is to evaluate the POPs and other chemicals listed in Aarhus Protocol as a whole.

Time frame: 3 years

Evaluation and Deficiencies: If it is aimed to update the regulations on the basis of EU legislations and UNIDO activities, this action should be discussed under Action 1.2 and additional chemicals listed in Aarhus Protocol must be involved in the new regulations.

Action 1.7 Revision of the Turkish Regulations in accordance with the Stockholm Convention: The objective is to revise the related regulations in conformity with the Convention.

Time frame: 3 years

Recommendations: This action should also be discussed under Action 1.2.

Action 1.8 Revision of the related regulations to provide a legal solution to fly ash problem including reclassification of the waste storage areas: The objective is to revise the related regulations to provide a legal solution to fly ash problem.

Time frame: 3 years

Recommendations: This action should also be discussed under Action 1.2.

Action 1.9 Revision of the related regulations to provide a legal solution to POPs disposal problem: The objective is to revise the related regulations to provide a legally based solution to POPs disposal problem.

Time frame: 3 years

Recommendations: This action should also be discussed under Action 1.2.

Action 1.10 Restricting the POPs concentrations in sewage by regulations: It is aimed to control the concentration of POPs in sewage by legislative instruments.

Evaluation and Deficiencies: This issue must be considered when updating the Turkish regulations.

Time frame: 3 years

Recommendations: This action should also be discussed under Action 1.2.

Action 1.11 Updating the POPs limit values in Soil Pollution Control Regulation (31.05.2005): The objective of the action is to define updated limit values for POPs in soil.

Evaluation and Deficiencies: The limit values have been updated by By-Law on Soil Pollution Control and Sites Contaminated by Point Sources for aldrin, DDT, dieldrin, endosulfan, endrin, α-HCH, β-HCH, lindane, hexachlorobenzene, heptachlor, pentachlorobenzene, toxaphene, PCBs and PCDD. However, no limits have been defined for other POPs. This will continue to be an issue as the Stockholm

Convention POPs list is revised and new chemicals are added to the annexes of the Convention.

Time frame: 3 years

Recommendations: The limits may be revised again under Action 1.2.

Action 1.12 Providing a legal solution to oil burning problem in small scale facilities: The aim is to control the POPs emissions resulting from the burning of oil in small scale facilities.

Time frame: 3 years

Evaluation and Deficiencies: The burning of waste oils containing PCBs has been handled by the By-law on Control of Waste Oils (30.07.2008).

Recommendations: The by-law may be updated when updating and revising the whole legislative framework under Action 1.2 according to the requirements of the Convention.

Action 1.13 Providing a legal solution to hazardous waste storage in dump sites: The aim is to avoid creating new sites contaminated with POPs.

Time frame: 4 years

Evaluation and Deficiencies: The limit values for PCBs and PCDD/Fs are given in the By-law on Control of Hazardous Wastes.

Recommendations: The by-law may be updated to involve POPs other than PCBs and PCDD/Fs when updating and revising the whole legislative framework under Action 1.2.

Action 1.14 Expanding the prohibited chemicals list to include the chemicals other than POPs that the country will prohibit: The objective of the action is to form a national prohibited chemicals list and cover all the chemicals in that list.

Time frame: 5 years

Evaluation and Deficiencies: It is crucial to revise the related regulations to provide a legal basis to compilation of such a list.

Recommendations: This action should be evaluated under Action 1.2.

Action 1.14 Restricting the PCDD/F contents and other POPs in wastes: It is aimed to control the POPs contaminated wastes.

Time frame: 3 years

Recommendations: This action should be evaluated under Action 1.2.

General Recommendations for Action 1

There are 14 sub actions of Action 1. However, when each action is evaluated individually, it is observed that many of these may be grouped under a single action. Accordingly, it would be better to define three sub actions for Action 1. These are:

1. Conducting a legal and institutional gap analysis (Short term, must be included in the NIP)
2. Revision and update of the related regulations comprehensively regarding the obligations of the Convention and EU (2 year activity)
3. Establishment of a coordination committee and permanent expert groups/networks working under this committee (long term activity)

Action 2: Measures on Prevention or Elimination of Emissions Resulted from the Intentional Production and Use

Two sub actions are defined under this main action category. The aim is to control the emissions from intentional production and use. The sub actions are evaluated below.

Action 2.1 Reducing or Eliminating the Emissions of POPs from intentional production and use: It is aimed to control the POPs emissions from intentional production and use.

Time frame: 5 years

Evaluation and Deficiencies: There is not a comprehensive and feasible inventory system in Turkey. A well processing inventory system is required to control the emissions primarily. Inventory will provide the information on sources. Then, best available techniques can be applied to control these emissions.

Recommendations: A PRTR system must be established in Turkey to control the emissions and sources of pollutants. The industries, ministries and academia should collaborate to determine the convenient and feasible ways of developing a PRTR system in Turkey.

Action 2.2 Prohibiting the Import of the Chemicals Listed in Annex A, B and C: It is aimed to ban the import of POPs.

Time frame: 3 years

Evaluation and Deficiencies: The import of chemicals is controlled by By-law on Inventory and Control of Chemicals and import of POP pesticides have been banned by By-law on Control of Pesticides. Moreover, the use, production and import of some POPs are banned by some other legislation. The import of PBDEs and PFOS is not prohibited currently. However, the control of import is a long term activity.

Recommendations: The activity must be defined as a long term activity and the effectiveness of control measures must be evaluated.

Action 3: Production, Import and Export, Use, Storage and Wastes of Pesticides Listed in Annex A of the Convention

This action defines the operational precautions related to the control of pesticides of Annex A. There are 10 sub actions under this category.

The sub actions defined under action 3 are listed below:

1. Controlling of the old pesticide storage areas and dumping sites and updating the databases (5 years)

2. Confirming that the POP pesticides can be disposed of permanently or not (3 years)
3. Extending the authority of environmental inspection (2 years)
4. OCPs must be kept controlled as a part of the inventory and inspection programs on account of the international commitments including the Directive 2000/EC/76. (2 years)
5. Collecting the data on sources and emissions of pesticides and wastes and evaluating these data by regular monitoring activities (5 years)
6. Preparing reports on environmental inspection activities each year (5 years)
7. Tightening the inspection activities to prevent accidents and ensuring the occupational health and safety (3 years)
8. Developing safe temporary storage (3 years)
9. Providing technology transfer and information exchange (4 years)
10. Emptying, restoration or demolition of the storage buildings appropriately and packaging (4 years)

Evaluation on Action 3:

The main aim of this action is to control the usage, storage and emissions of POP pesticides. Apart from that, there are two actions on environmental inspection activities. It is understood that the control of pesticides is intended to be achieved by environmental inspections. However, the responsibility and authority of controlling the manufacture, use and storage of pesticides are given to MFAL by Law on the Veterinary Services, Plant Health, Food and Feed. MEU is responsible to control the environmental levels of pesticides. The two ministries must collaborate to control the effects of POP pesticides on the environment. Instead of the actions listed above, the proposed actions are

- Establishing an inventory of storage areas and dump sites by regular inspections and control mechanisms (long term activity)
- Determining the cleanup activities for storage areas and dump sites: Project based activity (2-3 years)

- Controlling the manufacture, use and storage of pesticides based on a strong legal and practical system: can be achieved by legal and institutional regulatory actions (long term activity)
- Enhancing the collaboration between MEU and MFAL: can be achieved by the establishment of a coordination committee (long term activity)

Action 4: Manufacture, import, export, use, identification, labeling, removal, storage and disposal of PCBs and PCB containing equipments

The objective of this action is to phase out the usage of PCBs in the short term and completely eliminate in the long term. 15 specific actions are defined under this action and these are listed below:

1. Taking and updating the PCB inventory (5 years)
2. Ceasing out the usage of PCBs and PCB containing equipments no later than 2025 (5 years) (The action was fulfilled via the By-law on Control of PCBs and PCTs)
3. Identification of equipments containing PCBs more than 50 ppm before 2010 (5 years)
4. Establishing a collecting system for PCB/PCT containing equipments that would enable the safe removal (3 years)
5. Defining the duties of governmental institutions by preparing a national plan for hazardous waste management (2 years)
6. Completing the inventory of PCB wastes (2 years)
7. Establishment of appropriate incineration facilities for PCB containing wastes (3 years)
8. Establishment of technically sufficient facilities based on Bat/BEP principles for the disposal of POPs, POPs containing wastes and POPs contaminated environmental compartments (4 years)
9. Providing the recycling of fly ash at source rather than storage (5 years)
10. Ensuring the fast and safe transfer of PCB containing wastes in the facilities that used these equipments and controlling the storage in these facilities (5 years)

11. Decontaminating the PCB containing transformers and condensers by using environmentally soundly methods (4 years)
12. Validating the ecological reliability of parameters in the biological remediation of lower contaminated soil (3 years)
13. Identifying the possible new sources of PCBs (5 years)
14. Promoting the replacement of PCB containing equipments (5 years)
15. Assessment of the effects of PCBs on human, environment and biota (5 years)

Evaluation on Action 4:

The sub actions identified under action 4 are very detailed. Some of these actions can be achieved by legislative studies and some can be implemented by developing projects. Moreover, some of the actions have been already fulfilled by By-law on Control of PCBs and PCTs and By-law on Control of Hazardous Wastes. These actions can be grouped as follows:

- Taking the inventory of PCBs and PCB containing equipment and establishment of an permanent online inventory system: It is both a project based activity and a long term activity. MEU conducts a project to investigate the current situation on PCBs. Moreover, an efficient inventory system must be developed and the related regulations must be revised, accordingly.
- Defining the duties of governmental institutions by preparing a national plan for hazardous waste management (1-2 years)

Action 5: Manufacture, import, export, use, stockpiles and wastes of DDT

The objective is to determine the measures to be taken to control the DDT related problems. The sub actions defined under this category are given below:

1. Updating the inventory on Annex B chemicals (2 years)
2. Developing an information and management system for Annex B chemicals (2 years)

Evaluation on Action 5:

As for PCBs, a strong inventory system must be developed for Annex B chemicals. The inventory of these chemicals is taken by MFAL. An information sharing protocol has been signed between MFAL and MCT on the transfer of import and export data on pesticides to MFAL. These data must be shared with other institutions when needed. Current system works well. However, the possible illegal usages must be controlled via the fines stated in the regulations.

Action 6: Register for specific exemptions and continuing demands for exemptions

There is only one action defined under this category and the time frame was two years for this action. It was stated that Turkey has no industrial capacity to manufacture the pollutants listed in Annex A and B and these pollutants were not in use in Turkey. Therefore, Turkey didn't have the requisite qualifications to register for a specific exemption for the first list of POPs (dirty dozen). Accordingly, the need for specific exemptions for the new pollutants must be determined.

Evaluation on Action 6:

In order to determine the specific exemption needs, the intended usage of these chemicals must be investigated and evaluated in detail. The feasibility and cost of using the substitutes of these chemicals must be revealed. Hence, the action may be defined as follows:

- Investigating the feasibility and cost of using the substitutes of newly added POPs and determining the needs for register of specific exemptions (2-3 years project)

MEU, MFAL and MSIT (Ministry of Science, Industry and Technology) must carry out this action cooperatively. Moreover, industries must be involved in this process. By this way, actual economic burden can be determined. The period of the action may be as short as possible after the listing of a chemical in the Convention. The action must be repeated for each new chemical.

Action 7: Measures for reducing the unintentional emissions of PCDD/Fs, HCBs and PCBs

The objective is to control the unintentional emissions of PCDD/Fs, HCBs and PCBs. In order to achieve this, 18 sub actions were defined in the NIP:

1. Developing additional strategies for reducing the emissions of unintentionally produced POPs (3 years)
2. Reducing the emissions of POPs from the metal and cement industry and incineration facilities by the application of BAT/BEP principles (3 years)
3. Investments in metal industry for the application of BAT/BEPs (3 years)
4. Taking the inventory of fly ash production from the incinerators and metallurgical processes and the related handling processes (3 years)
5. Promoting the studies on the detoxification of fly ash and other POPs contaminated wastes (5 years)
6. Development and improvement of the inventory of the emissions of the unintentionally produced POPs (5 years)
7. Monitoring the POPs emissions in relation to the increased usage of natural gas in houses and development of more efficient waste management (5 years)
8. Investigating the cost of coal combustion in houses (4 years)
9. Conducting studies on the investigation of POPs emissions from the combustion of coal, wood and biomass and domestic waste (4 years)
10. Collecting data on the POPs releases to water and the residues of POPs in wastes and products and determining the measures regarding the control of releases (5 years)
11. Determining the possible sources of unintentionally produced POPs and monitoring the emissions (5 years)
12. Detection of all the areas which are affected from the POPs emissions via the ambient air and developing a policy for limiting the emissions from small sources (3 years)

13. Developing measures and legal limits for POPs emissions by using the available information from the metallurgical industry (3 years)
14. Generalizing the use of mineral oils and ecological lubricants (3 years)
15. Investigating the POPs emissions from waste storage areas, soil and water surfaces (3 years)
16. Harmonizing the legislation on the control of emissions of unintentionally produced POPs with the related EU regulations and EU POPs Protocol (3 years)
17. Collecting data on the POPs problems in the military facilities and integrating these data to the POPs inventory (5 years)
18. Promoting the education and public awareness activities on the strategies to comply with the obligations of the Convention and review and update of the strategies in every five years (5 years)

Evaluation on Action 7:

The scope of some of the activities listed under action 7 is very similar to each other and many of them can be evaluated under some other actions. The actions can be grouped under 7 categories as discussed below:

- Determining the all the possible point sources of POPs emissions (2 years project)
- Determining the all the possible non-point sources of POPs emissions (2 years project)
- Developing strategies to control the POPs emissions and revising the related regulations accordingly
- Promoting the implementation of BAT/BEPs for the control of POPs emissions
- Analyzing the feasibility and cost of implementations of the emission control activities
- Establishing an inventory system of the emissions
- Establishing an efficient and permanent monitoring network for the monitoring of POPs levels in air, water, soil and biota

These activities must be conducted in cooperation with all the related institutions.

Action 8: Determining the stockpiles, articles in use and wastes, preparation of an assessment plan and management of releases of DDT, PCBs, HCBs and pesticides from stockpiles and wastes

The objective of this action is to eliminate and releases of POPs from stockpiles and wastes. 12 actions are defined consequently.

1. Developing a database of contaminated sites, hotspots and historical loads (3 years)
2. Developing procedures for cleanup of the contaminated sites, hotspots and historical loads (2 years)
3. Solving the new or unsolved problems (3 years)
4. Determining the historical ecological POPs sources in detail (3 years)
5. Evaluating the risks by conducting a survey in districts and revealing the remedial precautions (5 years)
6. Preparing the cleanup program considering the economical circumstances (3 years)
7. Phase out and prohibition of the storage of POPs containing wastes and equipments in dump sites (3 years)
8. Investigating the levels of POPs in sewage sludge and integrating the results into the POPs emission inventory (4 years)
9. Promotion of the research on the cleanup of POPs contaminated wastes and sites (5 years)
10. Solving the problem of waste incinerators (formation of fly ash) (3 years)
11. Providing a solution to the issue of economical link between the recycling, combusting and dumping with a waste management perspective (3 years)
12. Developing a system to control the licensing, operation and monitoring of storage facilities for the transport and follow up of POPs wastes (4 years)

Evaluation on Action 8:

Instead of many single closely related actions, more briefly defined but comprehensive actions can be implemented:

- Determining the stockpiles and hotspots of POPs (2 years project)
- Developing remediation plans for the contaminated sites
- Establishing an inventory system for the POPs contaminated wastes
- Establishing safe storage facilities for the POPs contaminated wastes
- Investigating the feasibility and cost of cleanup activities for the POPs contaminated wastes
- Developing a system to control the transportation, storage and disposal of the POPs contaminated wastes

These activities must be conducted in cooperation with all the related institutions.

Action 9: Identification and environmentally soundly remediation of the contaminated sites

The objective is to determine and remediate the contaminated sites. 3 sub actions are defined accordingly.

1. Taking the inventory of the contaminated sites via an ecological risk analysis and evaluating the necessity of the remediation (3 years)
2. Making use of the in situ remediation technologies (3 years)
3. Emphasizing the importance of preventing the occurrence of new ecological problems (3 years)

Evaluation on Action 9: This action can be combined with action 8 since this issue is discussed therein.

Action 10: Managing the stockpiles and developing measures for handling and disposal of POPs wastes

The objective is to ensure the appropriate management and control of the stockpiles and POPs wastes. 5 sub actions are discussed:

1. Determining the proper storage facilities (3 years)
2. Enhancing the information on the stockpiles to ensure the safe management of these areas (4 years)
3. Preparing guidance documents for the safe handling and disposal of wastes (3 years)
4. Preparing guidance documents for the transport of wastes (3 years)
5. Establishing collection centers or collection schemes for the wastes (3 years)

Evaluation on Action 10: The issue is covered under action 8 generally. But, the following actions can be added to action 8:

- Preparing guidance documents for the safe handling and disposal of wastes
- Preparing guidance documents for the transport of wastes

Action 11: Identification and environmentally sound remediation of the contaminated sites

Both the wording and the scope of the action is exactly the same with action 9. However, the 4 actions defined are different than action 9.

1. Identifying the contaminated sites (5 years)
2. Controlling the identified contaminated sites to ensure the implementation of the remedial activities (5 years)
3. Preparing regulations and guidelines to clean up the contaminated sites (3 years)
4. Enhancing the capacity of the staff to implement the remedial measures (3 years)

Evaluation on Action 11: Since action 9 is composed with action 8, these activities must be discussed therein. Moreover, these activities have already been covered under action 8. Therefore, there is no need to add these actions to the extent of action 8.

Action 12: Ensuring the information exchange and participation of the stakeholders

The aim is to provide the basis for the implementation of the Convention by enhancing the coordination mechanism between the institutions and information exchange. 5 activities were defined accordingly.

1. Determining a national focal point for the information exchange (3 years)
2. Enhancing the skills and capacity of the staff (3 years)
3. Enhancing the national capacity to collect and make use of the multi-sectorial information (3 years)
4. Ensuring the stakeholder commitments (1 year)
5. Ensuring the confidentiality of the health related issues (1 year)

Evaluation on Action 12: As discussed under action 1.3, a permanent inter-ministerial coordination committee must be established. This committee must responsible for the implementation of the Convention in the country. Some expert groups that will work under the committee can be established and the follow up of the implementation of specific activities can be conducted hereby.

Action 13: Public awareness, education and information

The objective is to raise awareness on POPs issue and improve the related mechanisms. 7 activities defined for this purpose:

1. Preparing brochures, posters, bulletins and other informative documents to raise the awareness on POPs (5 years)
2. Raising awareness of the decision makers on the issue (3 years)
3. Implementing the public education activities (5 years)

4. Raising public awareness on the effects of POPs on the environment and human health (5 years)
5. Collecting and compiling information on POPs (3 years)
6. Improving the information sharing mechanisms (3 years)
7. Training of the related staff (3 years)

Evaluation on Action 13: The economic circumstances limit the implementation of these activities. An EU project can be designed for make the implementation of these activities possible or sponsor support can be provided.

Action 14: Effectiveness evaluation

The most important step of the implementation is the evaluation of the effectiveness of the Convention and the related measures. 2 activities were defined under this category.

1. Evaluation of the effectiveness of the Convention in Turkey (2 years)
2. Reporting the effectiveness evaluation (2 years)

Evaluation on Action 14: As mentioned above, this is most crucial step of the implementation. The effectiveness evaluation can be carried out by the coordination committee that will be established. The implementation of each action must be reviewed by the committee. Beside this, monitoring is an important tool to evaluate the efficiency of the Convention. Therefore, the establishment of a strong national monitoring system is of significant importance.

Action 15: Reporting

According to the obligations of the Convention, the reporting of the activities is an integral part of the implementation. 9 activities were defined under this action:

1. Reporting the measures taken to implement the Convention (2 years)
2. Reporting the measures taken reduce or eliminate releases from the intentional production of Annex A and B chemicals (2 years)

3. Reporting the measures taken reduce or eliminate unintentional releases (2 years)
4. Reporting the measures taken reduce or eliminate releases from the stockpiles and wastes (2 years)
5. Taking the complete inventory of the manufacture, import and export of Annex A and B chemicals (2 years)
6. Reporting the progress in the elimination of PCBs (2 years)
7. Reporting the information exchange (2 years)
8. Reporting the public awareness and education (2 years)
9. Reporting the research, development and monitoring (2 years)

Evaluation on Action 15: The reporting can be conducted by the coordination committee. Each expert group that will work under the committee can be assigned a specific duty and report the progress on their duty in a pre-determined timeline. 6 months may be appropriate for reporting the progress. These reports must be reviewed by the committee and the effectiveness of the implementation can be evaluated by this way. This mechanism will enable the detection of deficiencies in the implementation and new activities can be designed if needed or some activities can be removed if does not work.

Action 16: Research, development and monitoring

The objective is to strengthen the capacity on research, development and monitoring of POPs. 6 activities defined for this purpose:

1. Enhancing the institutional and research capacity on POPs management (5 years)
2. Determining the 3 proper laboratories for the monitoring of POPs (2 years)
3. Capacity building for the monitoring of POPs in these laboratories (5 years)
4. Monitoring environmental levels of POPs (5 years)
5. Managing the information appropriately (2 years)
6. Establish a system for inspecting the monitoring activities and quality assurance (2 years)

Evaluation on Action 16: The activities defined here can be composed with action 14 and action 15. The importance of establishment of an efficient monitoring system was emphasized before and the action is listed under action 7. The number of laboratories capable of analyzing POPs must not be limited to 3. In order to build capacity on research and development and management of POPs, the universities and research institutes must conduct projects in cooperation with the governmental institutions. The development of projects addressing the needs of the Ministries must be promoted.

Action 17: Technical and financial assistance

The objective is to determine the sources that can provide the technical and financial assistance for the implementation of Convention. 2 activities were defined:

1. Finding the source for technical assistance (2 years)
2. Finding the source for financial assistance (2 years)

Evaluation on Action 17: The coordination committee may be assigned responsible for finding the sources of technical and financial assistance together with the related institutions. However, these actions must be repeated if needed. Therefore, these may be designed as long term activities.

CHAPTER 7

CONCLUSIONS AND OVERALL RECOMMENDATIONS

The current status of implementation of Stockholm Convention was represented via analysis of legal framework, measures implemented and actions defined. This analysis revealed that crucial action is needed for the appropriate management of POPs. Some recommendations were developed on the actions and measures to be implemented by comparing and combining the outcomes of the gap analysis and the evaluation on activities listed in the current NIP of Turkey. These recommendations are itemized as follows:

1. The institutional and legal framework must be defined by conducting a comprehensive institutional and legal gap analysis.
2. The strength and weaknesses of the chemicals management mechanism in Turkey must be determined via a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis.
3. EU POPs Regulation must be fully harmonized.
4. A number of legislations must be revised and updated. Issues to be addressed in the legislations are:
    - Prohibition of the industrial use of PBDEs, hexachlorobenzene and hexabromocyclododecane
    - Prohibition of the import of PBDEs
    - Prohibition of the export of Annex A industrial chemicals and pesticides
    - Restriction of the production and use of PFOS
    - Controlling the production of new industrial chemicals

- Updating the Annex 6 of By-law on Certification of Pesticides to include $LogK_{ow}$ and BCF data of the new pesticides
- Integrating all the POPs to Annex III of By-law on Management of Hazardous Wastes
- Incorporating provisions to By-law on Control of Waste Oils regarding the burning of waste oils containing POPs
- Defining discharge standards in wastewater, emission limit values and receiving body standards for POPs
- Prohibition of the use, import and export of chemicals possessing POPs properties

5. A permanent coordination committee and expert groups must be established which will follow-up the implementation and provide coordination between the relevant institutions. Expert groups may hold meetings once in 2 months while coordination committee can meet once in 6 months and evaluate the actions of expert groups. The proposed expert groups are:

- Inventory of industrial chemicals
- Inventory of pesticides
- Inventory of unintentionally produced POPs
- Monitoring
- Reporting
- Effectiveness evaluation

6. A feasible and comprehensive inventory system must be developed. The inventory system must not be limited to POPs but it must be a system that will allow the collection of data on the production amount, use pattern and import and export of the chemicals. The inventory system must be based on a legal instrument. For instance, there is an existing inventory system developed based upon the "By-law on Inventory and Control of Chemicals". However, this system only collects data on the annual production and import amounts of substances which are produced or imported more than one tone per year. The manufacturers are obliged to submit the data to the online system according to the by-law. This system may be developed to collect data

on potential POPs. The Ministry of Environment and Urbanization may constitute a list of chemicals of high concern and include the chemicals possessing POP properties in this list and impose the obligation of submitting data on these substances by updating the by-law adequately.

7. "PCB Inventory System" must be put into service and the provisions of the By-law on Control of PCBs and PCTs must be implemented.
8. "Contaminated Sites Information System" must be put into service and an action plan must be developed for the management of contaminated sites and old environmental burdens.
9. National hazardous waste management plan must be prepared.
10. The feasibility and cost of using the substitutes of newly added POPs must be investigated and needs for register of specific exemptions must be determined.
11. A PRTR system must be established to monitor and control the emissions of POPs. EU PRTR Directive (166/2006) must be harmonized.
12. Monitoring networks must be established to monitor the levels of POPs in air, water, biota and wastewater sludge continuously.
13. A system must be established for inspecting the monitoring activities and quality assurance.
14. Application of BAT/BEPs must be promoted to control the emissions of POPs.
15. Awareness raising activities must be conducted and NGOs as well as the Ministry of Education must be involved in these activities.
16. Academic studies must be promoted on life cycle assessment of POPs, remediation of sites contaminated with POPs, monitoring of POPs in environment and biota and fate of POPs in the environment.

A number of these actions were also listed in one form or another in the NIP submitted to Secretariat in 2011. However, it is obvious that very little progress have been made since 2011. The main reason of this situation is that the activities designed for the implementation of Stockholm Convention are not included in the annual performance programs of the related ministries and national program of the

country. Consequently, there is no monitoring process for controlling the implementation of actions and measures. In order to handle this problem, a coordination mechanism must immediately be formed and assign responsibilities to each institution and the related institutions must integrate the relevant actions into their annual performance programs.

Moreover, Turkey does not have a chemicals management policy. There are numerous regulations on management of chemicals, wastes and products. The lack of a chemicals management policy resulted in the improper implementation of the laws and regulations and the Convention. The framework of the chemicals management must be determined by referring to international efforts like SAICM and then all the relevant legislative instruments must be updated and revised accordingly or new regulations may be issued.

In conclusion, the effective implementation of Stockholm Convention and other multilateral environmental agreements can only be achieved by the joint effort of the ministries, universities and other governmental institutions and the contribution of the institutions must be ensured by integrating the goals of these agreements into the governmental policies.

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APPENDIX

Table A.1: TURKISH LAWS AND REGULATIONS REGARDING PERSISTENT ORGANIC POLLUTANTS

Legislation	**Date & Number**	**Implementing Institution**	**Relevance with the POPs management**	**Relevant EU Regulation or International Agreement**
Environmental Law	11.08.1983 2872	Council of Ministers	Article 2 of the law provides the definition hazardous waste. Article 13 of the law sets principles for the manufacturing, use, storage, transportation, import and export of hazardous chemicals and management of hazardous wastes by referring to the related regulations.	-

Legislation	Date & Number	Implementing Institution	Relevance with the POPs management	Relevant EU Regulation or International Agreement
			Moreover, it is stated that Ministry of Economy can prohibit or restrict the import of certain chemicals, products and wastes by consulting the Ministry of Environment and Urbanization. The law appoints administrative fines for the case of violation of the provisions.	
Law on the Approval of Ratification of the Stockholm Convention *	02/04/2009 5871	Council of Ministers	The law states that the ratification of Stockholm Convention by Turkey was approved.	Stockholm Convention

Legislation	Date & Number	Implementing Institution	Relevance with the POPs management	Relevant EU Regulation or International Agreement
By-law on Control of PCB and PCTs	27.12.2007 26739	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management	Setting methods and principles of disposal of PCB containing equipments and prohibits the production and import of PCBs	96/59/EC (Directive on Disposal of PCBs and PCTs)
By-law on Inventory and Control of Chemicals	26.12.2008 27092	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management	Gathering and presentation of data on production and import of chemicals and control of the associated risk caused by chemicals	1907/2006 (REACH)

Legislation	Date & Number	Implementing Institution	Relevance with the POPs management	Relevant EU Regulation or International Agreement
By-law on Classification, Packaging and Labeling of Dangerous Substances and Preparations	26.12.2008 27092	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management	Management and control of classification, packaging and labeling of hazardous substances on the market with the aim of ensuring the protection of environment and human health and establishment of "Chemicals Advisory Board" to follow up the implementation of the by-law	67/548/EEC (CLP), 2006/121, 1907/2006 (REACH)
By-law on Compilation and Distribution of Safety Data Sheets for Hazardous Substances and Preparations	26.12.2008 27092	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of	Principles of compilation and distribution of material safety data sheets to protect the environment and human health	1907/2006 (REACH)

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		Chemicals Management		
By-law on Restriction of Manufacturing, Placing on the Market and Use of Certain Hazardous Substances, Preparations and Articles	26.12.2008 27092	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Chemicals Management	Restricts and prohibits the production, use and placing on the market of PCBs and PBBs	1907/2006 (REACH)
By-law on Cosmetics	23.05.2005 25823	Ministry of Health/ Medicine and Medical Devices Institution	The article 7 of the regulation prohibits the use of α-HCH in cosmetic products.	76/768/EEC (Directive on Cosmetic Products), 96/335/EC (Commission Decision

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				of establishing an inventory and a common nomenclature of ingredients employed in cosmetic products)
Notification on Auditing of Import of Chemicals that are Controlled for Environmental Protection	31.12.2013 28868	Ministry of Economy/ Directorate General of Product Safety and Inspection	The import of chemicals listed in Annex II of the notification including PCBs and PBBs is banned.	-
By-law on the Prevention and Reduction of the Effects of Major Industrial Accidents	30.12.2013 28867	Ministry of Labor and Social Security/ Directorate General of Occupational Health and Safety	Methods and principles concerning the necessary measures to ensure the efficient and continual prevention of	96/82/EC (Seveso II Directive)

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		Ministry of Environment and Urbanization/ Directorate General of Environmental Impact Assessment, License and Inspection	the major industrial accidents in the facilities in which PCDD/Fs can be formed as by-products of processes	
Law on Veterinary Services, Plant Health, Food and Feed	11.06.2012 5996	Council of Ministers (Ministry of Food, Agriculture and Livestock)	Sets forth the principles of production, import, use, packaging, labeling, transport, storage, certified or non-certified sale, certification, control and supply of pesticides and provides the legal basis for the relevant by-laws	-
By-law on Control of Pesticides	20.05.2011	Ministry of Food, Agriculture	Article 36 of the by-law states that	-

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	27939	and Livestock/ Directorate General of Food and Control/ Department of Pesticides	the production, import and sale of the pesticides whose certificates are invalidated is ceased out. The prohibition and phasing out of the pesticides which have been listed or will be listed by the Stockholm Convention as POP is fulfilled in the scope of this by-law.	
By-law on the Certification of Pesticides	25.03.2011 27885	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control/ Department of Pesticides	Article 22 of the regulation states that the certificates of the pesticides which have been prohibited by the international organizations/institutions are cancelled out by the Ministry of	-

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			Food, Agriculture and Livestock and this is the first step in the prohibition process of the pesticides listed by the Convention as POP.	
By-law on Sale and Storage of Pesticides	10.03.2011 27870	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control/ Department of Pesticides	Prohibiting the sale of POP pesticides due to the provisions of Article 15	-
By-law on the General Principles of Waste Management	05.07.2008 26927	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management	Determines the general principles of management of wastes from cradle to grave	2008/98/EC (Waste Framework Directive)
By-law on Control of Hazardous	14.03.2005	Ministry of Environment and Urbanization/ Directorate	Ensuring the environmentally	Basel Convention

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Wastes	25755	General of Environmental Management/Department of Waste Management	soundly management of hazardous wastes (including wastes contaminated with PCB, PCDD/Fs) by minimizing at source and preventing the adverse effects on human health and environment of wastes	91/689/EEC (Council Directive on Hazardous Wastes)
By-law on Control of Waste Oils	30.07.2008 26952	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management	Limiting the PCB content of the waste oils, prevention of the incineration of PCB containing oils and ensuring the environmentally soundly disposal of PCB containing waste oils	2008/98/EC (Waste Framework Directive), 75/439/EC (Directive on Disposal of Waste Oils)

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By-Law on Control of Waste Electrical and Electronic Equipments	22.05.2012 28300	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management	Determines the principles of disposal of waste electrical and electronic equipment containing PCBs, PBBs and PBDEs and prohibits the production and import of electrical and electronic equipment containing PBBs and PBDEs	2002/95/EC (Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), 2002/96/EC (Directive on Waste Electrical and Electronic Equipment)
By-law on Landfill of Wastes	26.03.2010 27533	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of	Sets down the rules for the storage of wastes contaminated with PCBs	1999/31/EC (Landfill of Waste)

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		Waste Management		
By-law on the Incineration of Wastes	06.10.2010 27721	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Waste Management	Sets out the principles of incineration of some wastes like PCBs and hazardous wastes	2000/76/EC (Incineration of Waste)
Turkish Food Codex By-law on Contaminants	29.12.2011 28157	Ministry of Food, Agriculture and Livestock/ Directorate General of Food and Control	Determining the allowable limit values for PCDD/Fs and dioxin like PCBs in foodstuffs	1881/2006/EC (Directive on Setting Maximum Levels for Certain Contaminants in Foodstuffs)
By-law on Control of Pollution	26.11.2005	Ministry of Environment and	Determination of discharge and	76/464/EEC (Directive

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Caused by Dangerous Substances in Aquatic Environment	26005	Urbanization/ Directorate General of Environmental Management/Department of Water and Soil Management	water quality standards for certain POPs (DDT, hexachlorocyclohexane, aldrin, dieldrin, endrin, hexachlorobenzene, endosulfan) and aiming the control the discharges of these pollutants	on Water Pollution by Discharges of Certain Dangerous Substances)
By-law on Control of Soil Pollution and Sites Contaminated by Point Sources	08.06.2010 27605	Ministry of Environment and Urbanization/ Directorate General of Environmental Management/Department of Water and Soil Management	Determines the methods and principles of detection of the sites contaminated or potentially contaminated by POPs and remediation and monitoring of these sites in line with the sustainable development goals, defines generic limit values for certain POPs in soil	-

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			(aldrin, DDT, dieldrin, endosulfan, endrin, α-HCH, β-HCH, lindane, hexachlorobenzene, heptachlor, pentachlorobenzene, PCB, toxaphene, PCDD)	
By-Law on Surface Water Quality Management	30.11.2012 28483	Ministry of Forestry and Water Affairs/ Directorate General of Water Management/ Department of Water Quality Management	Determining the limit values in water (environmental quality standards) for POPs by 2015 and reveals the vitality of monitoring of POPs in water and sediment	2000/60/EC (Water Framework Directive), 2008/105/EC (Environmental Quality Standards Directive)
By-law on Control of Air Pollution Arising from Industrial Facilities	03.07.2009	Ministry of Environment and Urbanization/ Directorate	Control the emissions of POPs from industrial facilities, sets down	2010/75/EU (Integrated Pollution

Legislation	Date & Number	Implementing Institution	Relevance with the POPs management	Relevant EU Regulation or International Agreement
	27277	General of Environmental Management/Department of Air Management and Climate Change	restrictions and limit values for emissions of PCDD/Fs and PCBs	Prevention and Control Directive)