



**ENABLING ACTIVITIES UNDER THE STOCKHOLM CONVENTION ON PERSISTENT  
ORGANIC POLLUTANTS FOR THE REPUBLIC OF TURKEY  
UNIDO PROPOSAL** (REVISED 12-DEC-02)

### Project Summary

Project Identifiers	
<b>1. Project Number:</b>	<b>4. GEF Implementing Agency/Executing Agency with Expanded Opportunities:</b> United Nations Industrial Development Organization
<b>2. Project Name:</b> Enabling activities to facilitate early action on the implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) in the Republic of Turkey	<b>5. Country eligibility:</b> Turkey is a signatory to the Stockholm Convention on Persistent Organic Pollutants (POPs)
<b>3. Country:</b>	The Republic of Turkey
<b>6. Name of GEF national operational focal point and date of the endorsement letter was signed (copy of endorsement letter attached):</b>	Mrs. Kumru Adanali Head of Foreign Relations Department Ministry of Environment Ankara Republic of Turkey  Endorsement Letter signed on the: 19 August 2002
Summary of Project Objectives, Activities, and Expected Outcomes	
<b>7. Project objective:</b>	The overall objective of the proposed Enabling Activities (EA) is to strengthen national capacity and capability to prepare a National Implementation Plan (NIP) for the management of POPs. This plan will provide a basic and essential level of information to enable policy and strategic decisions to be made and identify priority activities that Turkey should undertake in order to meet the requirements of the Stockholm Convention. It will be endorsed by all stakeholders prior transmission to the Conference of Parties (COP).
<b>8. Project activities:</b>	The proposed project activities will follow the step-wise process outlined in the GEF "Initial Guidelines for Enabling Activities for the Stockholm Convention on POPs" and are described in detail in the main body of this proposal. In summary, these activities will: <ul style="list-style-type: none"><li>• establish a sustainable national inventory system that identifies and quantifies POPs production, trade, storage, use or unintentional emission (Articles 3, 5, 6, 9, 10);</li><li>• assess current legal, institutional, and technical capacity in the management and monitoring of POPs;</li><li>• assess the socio-economic implications of POPs use and reduction, and create awareness of POPs-</li></ul>

<p>related risks amongst stakeholders through information exchange and education so as to facilitate the identification and introduction of alternative chemicals (substitutes) (Articles 9, 10);</p> <ul style="list-style-type: none"> <li>• identify, from preliminary inventories and assessments, the actions to be taken by Turkey as a matter of priority;</li> <li>• prepare and gain endorsement for, a National Implementation Plan, in accordance with Article 7.</li> </ul>
<p><b>9. Project expected outcomes:</b></p> <p>A National Plan for the implementation of the obligations of Turkey under the Stockholm Convention (NIP). National capacity and capabilities to implement the NIP and fulfil reporting requirements to the COP.</p>
<p>Project duration, costs and executing agencies</p>
<p><b>10. Project duration:</b> 2 years</p>
<p><b>11. Estimated total budget:</b> US\$ 469,700</p>
<p><b>12. Amount being requested from the GEF:</b> US\$ 469,700</p>
<p><b>13. Information on the organization submitting the proposal:</b></p> <p>UNIDO is the United Nations' specialized agency for industrial development. It has long-established programmes to improve the economic and environmental performance of industry in developing countries and in countries with economies in transition. It has accumulated significant knowledge of a variety of industries such as the chemicals, pulp and paper, cement and textiles sectors. It is conversant with issues related, inter alia, to pesticide formulation and to the unintentional generation of POPs by-products.</p> <p>UNIDO has participated in those Interagency Cooperative events that led to the intergovernmental negotiations for the preparation of the Stockholm Convention including:</p> <ul style="list-style-type: none"> <li>• international meetings held in Vancouver, Canada in 1995 and Manila, the Philippines, in 1996;</li> <li>• meetings of the Intergovernmental Forum on Chemical Safety (IFCS) and the Inter-Organization Programme for the Sound Management of Chemicals (IOMC);</li> <li>• Intergovernmental Negotiating Committee (INC) meetings for an International Legally Binding Instrument for Implementing International Action on Certain POPs.</li> </ul> <p>UNIDO is an executing agency with expanded opportunities for implementing GEF projects and, in 2001, became a member of the GEF Inter-Agency Task Force on POPs. It is mandated to submit enabling activity proposals directly to GEF. To date, 28 EA proposals submitted by UNIDO have been approved.</p> <p>UNIDO and its partners have developed a number of proposals and is executing projects:</p> <ul style="list-style-type: none"> <li>• to identify best technologies for POPs elimination;</li> <li>• to identify and evaluate alternative materials as substitutes for the prescribed POPs;</li> <li>• to identify suitable approaches to legal and social aspects of the management of POPs engaging government structures, industry and civil society.</li> </ul> <p>UNIDO's International Centre of Science and High Technology (ICS), Trieste, Italy, has prepared a training programme on POPs and is implementing it for national officials of developing countries</p>
<p><b>14. Information on the proposed executing organization.</b></p> <p>The Ministry of Environment (MoE) will be the executing agency of this project. Its structure and responsibilities are given in Annex 1. The Ministry is the authorized body in Turkey, which establish standards and guidelines, formulate policies, develop cooperation with other ministries, monitor the trends, enforce the current legislation and disseminate information related to the environment.</p>

15. Date the proposal was submitted to a GEF Implementing Agency/Executing Agency with Expanded Opportunities: 19 August 2002

16. Date the proposal was submitted to the GEF Secretariat: 24 October 2002

17. Date the proposal was approved:

18. Date of first Disbursement:

Information on Implementing Agency/Executing Agency with Expanded Opportunities:

19. Implementing Agency/Executing Agency with Expanded Opportunities contact persons:

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## PROJECT DESCRIPTION

### Background

Turkey is divided into 81 provinces, 842 districts and 3,201 municipalities (of which 15 are metropolitan) and has a population of 67.8 million, according to the State Institute of Statistics (SIS). 35% of the population lives in rural areas. 46% of the economically active population is employed by the agricultural sector, 15 % by the industry sector and 38.5 % by the service sector. The composition of GDP by sectors is 14%, 23.2% and 62.8% for agriculture, industry and services respectively.

Environmental issues, which have become common concern to all societies, take place as a priority issue in the national agenda of Turkey. The Turkish environmental management system was created as a consequence of the 3<sup>rd</sup> Five-year Development Plan (1973-1977) and was published in the Constitution of 1992 and the Environmental Law of 1983, among others. The constitution system and the institutional base were established before the Declaration of Rio in 1992 and the Agenda 21 that advocate important changes in the protection of policies and environmental management systems. In this context, Turkey is doing her utmost to ensure the implementation at national, regional and international level of the decision regarding environmental management.

Turkey is signatory to a number of international conventions. Of relevance to POPs issues are the Basel Convention on the Control of Transboundary Movement of Hazardous wastes and their disposal (adopted in 1989 and entered into force on 5 May 1992), the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for certain chemicals and pesticides in International Trade (September 1998) and Stockholm Convention on POPs (signed on 23 May 2001).

Preliminary assessments on Turkey's current situation to POPs indicate that high priority should be given to the following:

- Capacity building for assessment and management of POPs wastes as there are significant obsolete stocks of DDT and PCBs in the country;
- Due to waste transformer oil recycling practices, it is expected that a large number of transformers and capacitors are polluted with PCBs, thus the assessment of the quantity and phasing out of the contaminated oil should be addressed.
- The infrastructure such as laboratories, technical expertise and supporting legislation are also lacking. Therefore, special emphasis should be put on the capacity building for undertaking dioxin and furan release inventories and the development of a national strategy for the regular monitoring of these chemicals.

Further information on the use of POPs chemicals in Turkey is given in Annex 2.

## **Project Objective**

The overall objective of the proposed EA is to strengthen national capacity and capability to prepare a National Implementation Plan (NIP) for the management of POPs. This plan will provide a basic and essential level of information to enable policy and strategic decisions to be made and identify priority activities that Turkey should undertake in order to meet the requirements of the Stockholm Convention. It will be endorsed by all stakeholders prior its transmission to the Conference of Parties.

## **Project Activities**

### **1. Co-ordinating Mechanism and Process Organisation**

#### *1.1 Needs assessment and strengthening of national focal point*

The technical and human resources of the national executing agency will be assessed. A national project office will be established within the executing agency and manned by a full-time National Project Coordinator (NPC) who will provide overall project coordination. During the first three months of the project, an institutional expert will assist the NPC in order to facilitate legal aspects of the project such as procedures for tenders, contract and agreement preparation.

#### *1.2 Formation of multi-stakeholder national co-ordinating committee*

A National Coordinating Committee (NCC) will be formed comprising the following bodies:

- Ministries of Environment, Health, Agriculture and Rural Affairs, Energy and Natural Resources, Finance, Industry
- State Planning Organization
- Undersecretary for Foreign Trade
- Turkish Scientific and Technical Research Council – Marmara Research Centre (TUBITAK-MAM)
- Turkish General Staff
- Middle East Technical University
- Gazi University
- Turkish Chemical Manufacturer's Association
- Turkish Cement Manufacturer's Association
- Turkish Technology Foundation
- Private Sector and Industry Representatives
- Non-governmental organizations and public interest groups active in the chemical field

#### *1.3 Drawing-up overall work plan and assigning responsibilities amongst government departments and other stakeholders*

The Executing Agency with the guidance of the NPC and the Chief Technical Advisor (CTA) will prepare the work plan. The NCC, where NGOs are also represented, will review if necessary, comment on and finally approve the work plan. Strong emphasis will be placed on the private sector and civil society to ensure their involvement in the execution. All responsibilities, timelines and the budget (based on the tenders) will be clearly spelled out in order to

guarantee the fast, safe and accurate execution of the project. The parallel executable activities will be underlined for time effective implementation.

#### *1.4 Identification and sensitisation of main stakeholders*

The NPC will prepare a preliminary directory of stakeholders and canvass their support and cooperation for the enabling activities. This directory will form the basis for awareness raising and information exchange activities, commencing with the inception workshop.

#### *1.5 Inception workshop*

A two-day workshop will be held in Ankara to raise awareness of POPs issues and the enabling activities project amongst the widest possible range of stakeholders. An international expert will facilitate discussion amongst the project officials and the approximately 60 invitees. The agenda will include discussion of the planned activities and timeframes, a presentation of environmental monitoring and inventory practices, description of sound disposal techniques and opportunities for the phasing out of POPs substances.

## **2. Preliminary POPs Inventories and Assessments of National Infrastructure and Capacity**

### *2.1 Preparation of National Chemical Profile*

A national profile to assess the national infrastructure for the management of chemicals will be prepared by two national experts following recognised methodologies. Relevant structures of the national infrastructure will be reviewed with particular emphasis on their ability to manage the obligations of the Stockholm Convention.

### *2.2 Constitution of task teams responsible for inventories*

The following task teams will be constituted:

- Research team to undertake preliminary inventories of trade, use and distribution of POPs-containing products.
- Contamination team to assess contaminated sites, obsolete stocks and disposal opportunities.
- Emission team to prepare preliminary inventories of unintentionally produced POPs.
- Institutional team to assess infrastructure, enforcement, monitoring and R&D capacities.
- Health team to assess the population's exposure to POPs.

### *2.3 Training in inventory procedures*

Two international experts will provide training in inventory procedures. The training will include:

- Procedures for collecting POPs-related information;
- Undertaking preliminary inventories of trade, use and stocks;
- Initial surveying of contaminated sites;
- Monitoring and reporting methodologies using established guidelines;
- Undertaking inventories of releases into air, water, soil and sediment;
- Sampling for chemical analysis of POPs compounds especially POP pesticides;
- Obligations of the Stockholm Convention with regard to POPs management and infrastructure;
- Identification of POP-related health impacts from existing reporting schemes.

### *2.4 Preliminary inventory of production, distribution, use, import and export*

One expert will gather relevant information regarding the import, use, distribution and export of POPs containing products from relevant institutions. This activity will start in the 5<sup>th</sup> project month and be finalized in one month.

### *2.5 Preliminary inventory of stocks and contaminated sites; assessment of opportunities for disposal of obsolete stocks*

One expert will undertake an inventory of stocks, contaminated sites and assess opportunities for disposal. This work will commence in the 5<sup>th</sup> month and be finalized by the 9<sup>th</sup> project month. Where priority contaminated sites are identified, a preliminary sampling programme may be undertaken.

## *2.6 Preliminary inventory of releases to the environment*

Two experts will use internationally accepted methodologies to estimate total unintentional production of POPs. They will assess the scenarios developed from different toolkits used and review their validity to Turkey. Four months are available to complete this activity.

## *2.7 External independent review of initial national POPs inventories*

Draft versions of the preliminary inventories described above will be submitted to the NCC. The NCC, supported by an international consultant will review the inventories and provide comments and recommendations. The expert teams will revise the preliminary inventories taking into account the comments and recommendations received. Final preliminary inventories will be submitted to the NCC for approval.

## *2.8 Assessment of infrastructure capacity and institutions to manage POPs, including regulatory controls; needs and options for strengthening them*

The infrastructure capacity of Turkey to manage POPs will be described and assessed. The responsibilities of relevant institutions and the regulatory instruments at their disposal will be reviewed. Analysis will include the capabilities of these institutions to play a full role, within the Conference of the Parties, to propose and review candidate POPs as set out in Article 8 of the Convention. An analysis of the changes necessary to accommodate actions to meet obligations under the Stockholm Convention will be prepared. An institutional expert will be engaged for two months to undertake these tasks and the activity below.

## *2.9 Assessment of enforcement capacity to ensure compliance*

The technical and human resources available for the enforcement of current chemical management regulations will be assessed. The changes necessary to meet the compliance challenges of the Stockholm Convention will be determined.

## *2.10 Assessment of social and economic implications of POPs use and reduction; including the need for the enhancement of local commercial infrastructure for distributing benign alternative technologies/products*

An assessment of the social implications of restricting or discontinuing POPs use and unintentional production will be made. This assessment will be based on consideration of the indicative list of issues given in Annex F of the Convention. The identification of opportunities to transfer technology and share skills with more experienced countries will be particularly important. UNIDO will provide technical support to the expert engaged for one month to undertake this activity.

## *2.11 Assessment of monitoring and R&D capacity*

The technical and human resources available for the monitoring of enterprise performance in relation to current chemical management regulations will be assessed. The changes necessary to meet the initial and continuing requirements of the Stockholm Convention will be determined. An assessment will be made of national and human resources available for the analysis and evaluation of POPs-containing products. Opportunities to analyse POPs-containing products at regional facilities will be examined. An expert will be engaged for four months for this activity.

## *2.12 Identification of POPs related human health and environmental issues of concern; basic risk assessments*

Two national health experts will collate and review available health information related to environmental exposure to POPs. Additionally, in conjunction with information from other inventory teams, they will prepare an initial assessment of POPs-related risks faced by the population of Turkey. Particular emphasis will be placed on communities in areas where high-levels of POPs contamination or environmental release are suspected. The team will provide recommendations for further related studies that may need to be undertaken.

## *2.13 Workshop on preliminary inventories*

Final draft preliminary inventories and assessments will be submitted to the NCC for approval. The Executing Agency, on behalf of the NCC, will organise a one-day meeting to review and discuss the outcomes. It is expected that approximately 15 persons representing all main stakeholders will be invited.

### **3. Priority Setting and Determination of Objectives**

#### *3.1 Development of criteria for prioritisation*

A national expert will review the inventories and assessments and develop criteria for the ranking of priority actions recommended by the various expert teams. These criteria will take into account health, environmental and socio-economic impacts and the availability of alternative solutions. In preparing these criteria, the expert will take advantage of experience of risk-reducing technologies and priority setting undertaken in other countries. The proposed criteria will be submitted to the NCC for review and approval.

#### *3.2 Determination of national objectives in relation to priority POPs or issues*

The national expert who develops these criteria will also facilitate a meeting of the NCC at which national objectives in relation to priority POPs or issues will be proposed. The expert will then prepare a draft prioritisation report.

#### *3.3 Organization of a national priority validation workshop*

A two-day workshop will be organized for 60 participants to validate the criteria and national objectives established by the NCC and to discuss and endorse the draft Prioritisation Report. Following the meeting, the expert will prepare a final report, setting out criteria, national objectives and priorities taking into account the comments made by the NCC and participants.

### **4. Formulation of National Implementation Plan including specific Action Plans on POPs**

#### *4.1 Training and assigning mandates to task teams to develop proposals for addressing priorities*

Based on the outcome of the validation workshop, the NCC will propose to the executing agency the recruitment of experts to prepare action plans necessary to address national priority issues. International experts will present training in the development of Action Plans, strategies and the NIP for the experts recruited.

#### *4.2 Identification of management options, including phasing out and risk reduction options*

Technical reports setting out management and risk-reduction options to address national priority issues will be prepared. These reports will take into account the increased effectiveness and efficiencies to be gained from building, wherever possible, upon current legislation, institutional structures and capabilities. Three experts will be appointed for three months to prepare these reports for submission to the NCC.

#### *4.3 Determination of the need for the introduction of technologies, including technology transfer, possibilities of developing indigenous alternatives*

Internationally available alternative technologies, techniques and strategies will be reviewed to assess their ability to meet requirements for the elimination, reduction and disposal of POPs in Turkey. This review will use criteria based, *inter alia*, upon those set out in part V of Annex C (unintentional production) of the Convention in order to select best available techniques (BAT) and environmentally sound alternatives most appropriate to Turkey and include consideration of indigenous methods that provide protection from pests and diseases for which POPs chemicals may be currently employed.

Two national experts will be recruited for a period of two months to undertake this review and prepare reports for the NCC.

#### *4.4 Assessment of the costs and benefits of management options*

Cost benefit analyses will be prepared to evaluate the economic feasibility and costs associated with the recommended management options set out in the technical reports prepared during the activities above. Two national experts will prepare these reports for the NCC for a period of two months.

#### *4.5 Development of a national strategy for information exchange, education, communication and awareness raising*

A national strategy for information exchange, education, communication and awareness raising will be prepared in accordance with Articles 9 and 10 of the Convention. A focal mechanism for information exchange will be proposed. A national expert will be engaged for two months to prepare this strategy and submit it to the NCC. The Ministry's

Environmental Education Unit, which functions under a multi-stakeholder environmental education committee will cooperate to deliver the activities identified under this step.

#### *4.6 Defining expected results and targets*

The technical, management, BAT and cost–benefit reports, together with the strategy for information exchange will be discussed by the NCC. Proposed actions will be presented by the NCC for discussion and endorsement at a fourth stakeholder workshop to be held in the 19<sup>th</sup> project month.

#### *4.7 Development and formulation of a detailed implementation plan, including an action plan for unintentional by-products, PCBs and, where appropriate, for DDT and other POPs as prioritised*

Preparation of the NIP will begin in the 17<sup>th</sup> project month with the collation of all component reports prepared in earlier activities. It will take into account decisions of the NCC as well as comments and endorsements received from the various stakeholder workshops. The draft NIP will be presented to the NCC for review.

Three experts will be engaged for five months to prepare the draft NIP and make any necessary revisions. The revised draft will be submitted for review by an independent consultant.

#### *4.8 Preparation of initial funding request package for implementation, including cost estimates and incremental costs*

Proposed actions identified in the NIP will be costed and funding request packages prepared. These funding packages will establish implementation timetables consistent with Turkey meeting its obligations under the Convention. Two experts will be engaged in the 21<sup>st</sup> project month to undertake this activity.

#### *4.9 Expert review of Implementation Plan*

An independent consultant will review and comment on the revised draft NIP taking in account, in particular, the requirements set out in Article 7 of the Convention.

### **5. Endorsement of NIP by Stakeholders**

#### *5.1 Submission of final draft NIP to stakeholders for comments*

To facilitate review and the building of consensus around the NIP, stakeholders will be invited to provide written comments during a two weeks consultation period. The circulation, with the revised draft NIP, of a questionnaire prepared by the independent consultant who reviewed the document, will aid this process. Written submissions will be gathered by the NCC and taken into account in the preparation of the final draft NIP. The independent consultant will be retained for a period of two months for this activity.

#### *5.2 Final workshop to review and endorse the NIP*

A workshop will be organized for all the stakeholders and relevant governmental bodies to review and endorse the final draft NIP. The workshop will also seek to obtain stakeholder commitment of the resources necessary for the successful implementation of the NIP. Approximately 60 people, including high-level governmental officials, national decision makers and international development partners will be invited for this one-day meeting.

A press conference will be held to inform the public.

Following the workshop, the NIP will be submitted, in English, to the Secretariat of the Convention for transmission to the Conference of the Parties.

### **Project Management and Implementation**

The Ministry of Environment of Turkey is charged with the protection of the environment, the co-ordination of the actions of the various institutions in this field, and the preparation and supervision of relevant legislation. It is also responsible for national implementation of actions required under international environmental agreements. It will be the executing agency for the proposed enabling activities project and has requested UNIDO assistance in submitting its proposals to the GEF.



On approval of the proposal, UNIDO and the Ministry will agree on a subcontract for the national administration of the enabling activities.

Under the terms of this subcontract, the Ministry will, *inter alia*;

- call principal stakeholders to form a National Coordinating Committee (NNC) to oversee and coordinate the successful implementation of the enabling activities and to lobby high-level commitment to the objectives of the Stockholm Convention;
- establish a national project office within the General Directorate of Environmental Pollution Prevention Control of the Ministry charged with the successful implementation of the enabling activities;
- appoint a National Project Coordinator (NPC) with day-to-day responsibility for the management and coordination of the enabling activities and reporting to the NNC;
- agree with UNIDO the appointment of a Chief Technical Advisor (CTA) and other international experts as might be required to build national capacities to ensure the successful preparation of the NIP.

The NNC will

- have meetings on a regular basis;
- agree working arrangements and implementation plans with the NPC and the Executing Agency;
- oversee the work of the national experts engaged to undertake the various studies required for the NIP and receive and review their reports;
- lead stakeholder workshops to develop consensus and commitment to NIP objectives and plans.

The NPC will

- have day-to-day responsibility for the management and coordination of the enabling activities, including subcontract budgets, and reporting to the NNC;
- appoint national experts as necessary to undertake the various studies required during the course of the project using terms of reference agreed by the NNC and ensure the quality of their work;
- provide a secretariat function to the NNC and stakeholder workshops;
- provide a focal point for information about the implementation of the enabling activities and serve as a publicly-accessible National Information Centre on POPs;
- report regularly to the NNC, to the executing agency, and to the UNIDO appointed CTA, the progress of the project and the disbursement of project funds.

The CTA will

- monitor and supervise the development of the NIP in Turkey, working in close co-operation with the NPC and reporting to UNIDO;
- ensure that there is an exchange of experience and expertise between countries of the region;
- ensure national awareness of regional initiatives on POPs.

UNIDO will

- appoint a CTA
- upon request of the Ministry of Environment of Turkey, appoint international experts, wherever possible drawn from the region, for specific project tasks;
- monitor project execution by means of quarterly progress reports and close contact with the CTA;
- organize a mid-term evaluation in line with GEF guidelines at the end of the first year;
- evaluate the efficiency of the project management, including outcomes, the budget and timelines.

PROJECT IMPLEMENTATION PLAN																									
DURATION OF PROJECT																									
Activities	PROJECT MONTHS																								
Completion of major activities	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
<b>1</b>	<b>Determining Co-ordinating Mechanism and Process Organisation</b>																								
1.1	Needs assessment of focal point																								
1.2	Strengthening of national institution to serve as Focal Point																								
1.3	Formation of multi-stakeholder national coordinating committee																								
1.4	Drawing-up overall workplan																								
1.5	Identification and sensitization of main stakeholders																								
1.6	Inception workshop																								
<b>2</b>	<b>Preliminary POPs Inventories and Assessments of National Infrastructure and Capacity</b>																								
2.1	Preparation of National Chemical Profile																								
2.2	Constitution of task teams responsible for inventories																								
2.3	Training in inventory procedures																								
2.4	Preliminary inventory of production, distribution, use, import and export																								
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2.12	Identification of POPs related human health and environmental issues of concern																								
2.13	Workshop on preliminary inventories																								
<b>3</b>	<b>Priority Setting and Determination of Objectives</b>																								
3.1	Development of criteria for prioritisation																								
3.2	Determination of national objectives																								
3.3	Organization of national priority validation workshop																								
<b>4</b>	<b>Formulation of National Implementation Plan including specific Action Plans on POPs</b>																								
4.1	Training and assigning mandates to task teams to develop proposals for addressing priorities																								
4.2	Identification of management options																								
4.3	Determination of the need for the introduction of technologies																								
4.4	Assessment of the costs and benefits of management options																								
4.5	Development of a national strategy for information exchange																								
4.6	Defining expected results and targets																								
4.7	Development and formulation of a detailed implementation plan																								
4.8	Preparation of initial funding request package for implementation																								
4.9	Expert review of Implementation Plan																								
<b>5</b>	<b>Endorsement of NIP by Stakeholders</b>																								
5.1	Submission of final draft NIP to stakeholders for comments																								
5.2	Final workshop to review and endorse NIP																								

**GEF PROJECT BUDGET**

Component	Name of units	Number of Units	Unit Cost (US\$)	Total Cost (US\$)
<b>1. Co-ordinating Mechanism and Process Organisation</b>				
National Project Coordinator (NPC)	work months	24	2,500	60,000
Chief Technical Advisor (CTA)	work months	5	13,000	65,000
Technical assistance (local)	work months	3	2,000	6,000
Technical assistance (international)	work days	6	500	3,000
Inception Workshop	participants/day	60/2	100	12,000
Travel (national experts)	person	60	50	3,000
Equipment (computers, softwares)		3	5,000	15,000
<b>Sub-total</b>				<b>164,000</b>
<b>2. Preliminary POPs Inventories and Assessments of National Infrastructure and Capacity</b>				
Technical assistance (local)	work months	32	2,000	64,000
Technical assistance (International)	work months	2	13,000	26,000
Training on Inventory Procedures	day	10	500	5,000
Analysis Equipment (Kit)	sample	80	100	8,000
Workshops on initial inventories	participants/day	15/1	100	1,500
Travel (national experts)	person	80	50	4,000
<b>Sub-total</b>				<b>108,500</b>
<b>3. Priority Setting and Determination of Objectives</b>				
Technical assistance (local)	work months	4	2,000	8,000
Priorities validation workshop	participants/day	60/2	100	12,000
Travel (national experts)	person	60	50	3,000
<b>Sub-total</b>				<b>23,000</b>
<b>4. Formulation of National Implementation Plan including specific Action Plans on POPs</b>				
Technical assistance (local)	work months	37	2,000	74,000
Technical assistance (international)	work months	3	13,000	39,000
Training on NIP development	day	5	500	2,500
Objectives defining workshop	participants/day	30/1	100	3,000
Travel (national experts)	person	30	50	1,500
<b>Sub-total</b>				<b>120,000</b>
<b>5. Endorsement of NIP by Stakeholders</b>				
Technical assistance (local)	work months	2	2,000	4,000
Final Workshop	participants/day	60/1	100	6,000
Others (Publicity)			6,500	6,500
Travel (national experts)	person	60	50	3,000
<b>Sub-total</b>				<b>19,500</b>
Miscellaneous: printing costs, etc.				13,000
Contingency (5%)				21,700
<b>Total Cost of Enabling Activities</b>				<b>469,700</b>

**ANNEX 1**  
**DETAILED INFORMATION ON THE EXECUTING AGENCY**

**Ministry of Environment**

**MoE**

General Directorate, Environmental Pollution Prevention and Control

**Mr. Sami Agirgün**

Director

ADRESS:

Eskisehir Yolu,

Ankara

Turkey

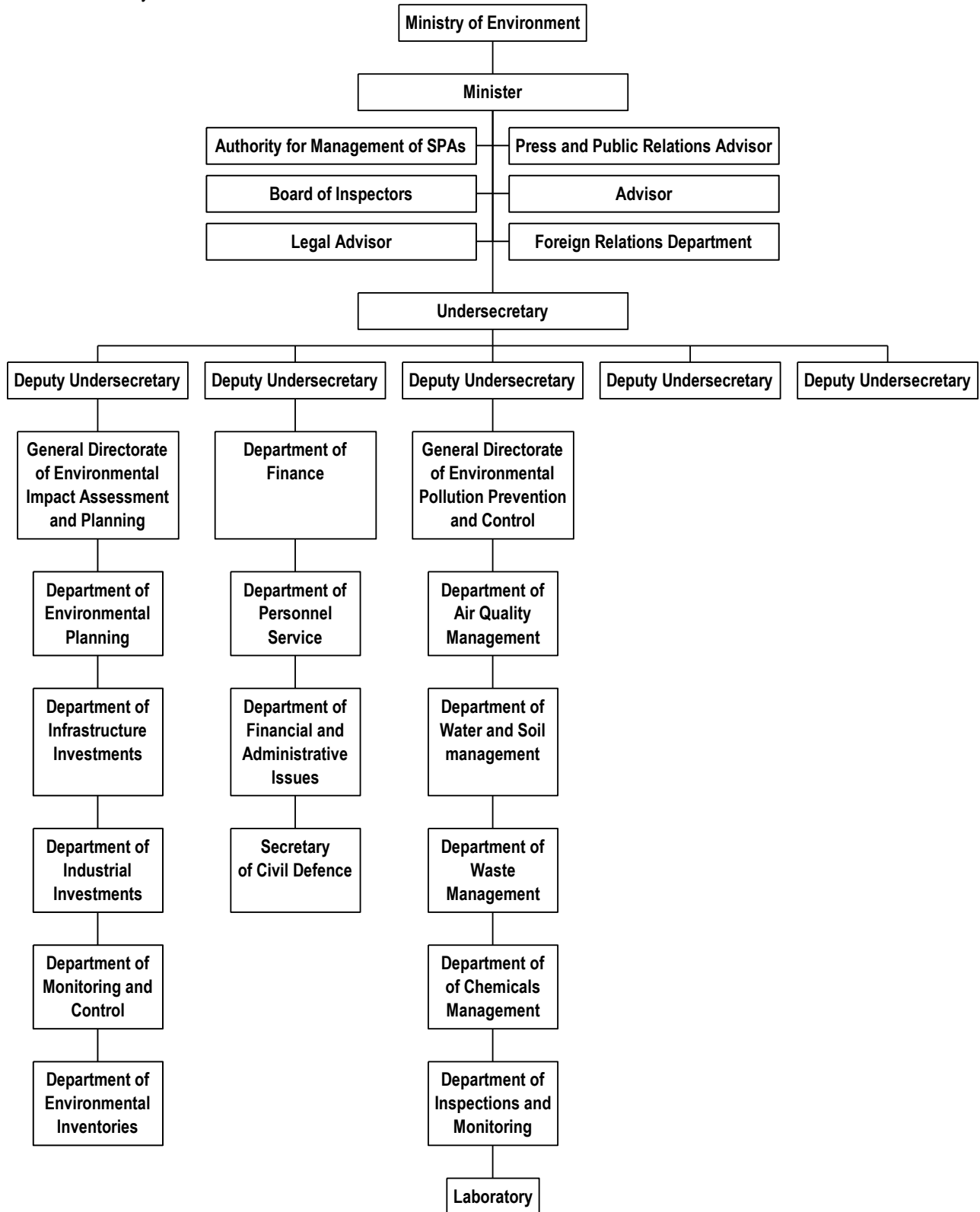
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The Executing Agency shall be the Ministry of Environment. The organisation chart below indicates the connectivity within the ministry.



Functions and powers of the Ministry:

1. Establish standards and guidelines relating to the pollution of the air, water and land as well as those relating to noise and other forms of environmental pollution;
2. Assist the Minister in formulating policies relating to environmental matters;
3. Develop in co-operation with other Government authorities economic measures to encourage environmentally sound and sustainable activities;
4. Co-ordinate the activities of all bodies concerned with environmental matters and to serve as the main channel of communication between these bodies and the Government;
5. Monitor trends in the state of the environment and institute measures for its improvement for implementation by the appropriate designated authorities or bodies in the country;
6. Undertake, conduct and promote investigations, studies, surveys, research, and analysis, into environmental matters of immediate or long-term relevance to Turkey;
7. Promote, in collaboration with other appropriate bodies and organizations, training and education programmes in the field of environment with a view to create national awareness in all sectors and upgrade national capabilities and skills in these fields;
8. Serve as the official focal point for co-operating and liaising with national and international organizations on environmental matters;
9. Without prejudice to economic and social advance of Turkey, to ensure the observance of proper safeguards in the planning and execution of all development projects that are likely to interfere with the quality of the environment;
10. Advise the Minister and to make appropriate recommendations either upon request or on its own initiative on any environmental problems or trends of any importance;
11. Establish guidelines for preparing Environmental Impact Assessments on all development projects;
12. Review and approve from an environmental point projects with potential impacts on the environment;
13. Control all forms of environmental pollution including pollution caused by discharge of toxic wastes into the air, water and land in the manufacture of toxic or hazardous chemicals;
14. Institute measures for the co-ordination and enforcement of environmental protection legislation and of international conventions and for the prosecution of the offences in co-operation with relevant bodies and forces.

The Ministry of Environment or any other body or person authorized by MoE may:

1. Enter and inspect any premises where the MoE has reasons to believe the provisions of the above mentioned act are being contravened or are reasonably likely to be contravened;
2. Close any premises or stop any operation, works, or project that is causing or is reasonably likely to cause danger to the environment or the public.

## ANNEX 2

### DETAILED INFORMATION ON THE PRESENT STATE OF POPs

#### General information on POPs

##### 1. Pesticides

	<b>Description</b>
<b>DDT</b>	Insecticide used on agricultural crops, especially cotton, and insects that carry diseases like malaria and typhus. DDT is still widely used in developing countries mainly for mosquito control and also for the production of Dicofof.
<b>Aldrin and dieldrin</b>	Insecticides used for crops like corn and cotton. Also used for termite control.
<b>Chlordane</b>	Broad spectrum contact insecticide used on agricultural crops including vegetables, small grains, maize, other oilseeds, potatoes, sugarcane, sugar beets, fruits, nuts, citrus, cotton, and jute. Used on home lawns and gardens. Also used in control of termites.
<b>Endrin</b>	Insecticide used mainly on field crops such as cotton and grains. Used as a rodenticide to control mice and voles. Also used to combat birds.
<b>Heptachlor</b>	Stomach and contact insecticide, used primarily against soil insects and termites. Also used against cotton insects, grasshoppers, some crop pests, and to combat malaria.
<b>Hexachlorobenzene (HCB)</b>	Fungicide used for seed treatment of wheat, onions, and sorghum. Also found as impurity in several pesticide formulations. Also is found as an industrial by-product
<b>Mirex</b>	Stomach insecticide used to combat fire ants and leaf cutters, harvester termites, mealy bug, and yellow jacket wasps. Also used by a fire retardant in plastics, rubber, and electrical goods.
<b>Toxaphene</b>	A mixture of more than 670 chemicals and an insecticide primarily used to control insect pests on cotton and other crops. Used to control insect pests on livestock and to kill unwanted fish in lakes.

##### *Polychlorinated biphenyls (PCBs)*

Major emission sources of PCBs are: certain high temperature industrial processes such as pyrogenous emission from burning, firing, combustion of fossil fuels, waste incineration, road transport, and crude steel production. PCBs are used in synchronous condensers and capacitors as a good dielectric fluid, in transformers as unburnable heat exchanger, for lubrication and hydraulic oils, in impregnators, as an insulator liquid and as refrigeration liquid.

##### *By-products: PCDD/PCDFs (polychlorinated dibenzo-P-dioxins and dibenzofurans) and Hexachlorobenzene (HCB)*

PCDDs/Fs have never been produced intentionally. They are formed as by-products of numerous industrial activities and combustion processes. Almost all of the 210 individual congeners have been identified in emissions from thermal and industrial processes and consequently PCDDs/Fs are found as mixtures of individual congeners in environmental matrices such as soil, sediment, air and plant and lower animals. PCDDs/Fs, particularly the higher chlorinated are poorly soluble in water, have low volatility and adsorb strongly to particles and surfaces. Thus, PCDDs/Fs can hardly be identified in water and are immobile in soils, especially the 2,3,7,8-chlorine substituted PCDDs/Fs, which are extremely stable in the environment and bioaccumulate in fatty tissues of animals and human.

Major possible sources of dioxins and furans are waste incineration, thermal metallurgical processes, power plant combustion of fossil fuels, residential combustion and firing of wood and coal at households, specific chemical processes releasing intermediates, PCB based transformers and electric arc furnace.

Primary sources of environmental contamination with PCDDs/Fs in the past were due to production and use of chloro-organic chemicals including the pulp and paper industry. PCDFs were/are formed as inadvertent by-products in the production and use of polychlorinated biphenyls (PCBs) and, in combination with PCDDs, in the production of

chlorophenols and have been detected as contaminants in these products. PCDFs can also be found in residual waste from the production of vinyl chloride and the chloralkali process for chlorine production. Factors favourable for the formation of PCDDs/Fs are high temperatures, alkaline media, presence of UV/light, and presence of radicals in the reaction mixture/chemical process.

Major sources of Hexachlorobenzene (HCB) are almost the same as dioxins and furans: waste incineration, thermal metallurgical industries, use of chlorinated fuels in furnace installations, combustion of fossil fuels, firing of chlorinated compounds, use of solvents and wood preservers and electric arc furnace.

### Country specific information:

The Ministry of Agriculture and Rural Affairs of Turkey is responsible for the marketing, registration, and control of agrochemicals. The Central Plant Protection Research Institute is affiliated with the Ministry of Agriculture and Rural Affairs. The Institute has been working on quality control of agrochemical formulation and resistance/efficacy of agrochemicals. It is also responsible for analysing and monitoring food samples for pesticide residues and for controlling the quality certificate of the imported agricultural products.

### Production distribution, use, export, import procedures of POPs

Import of plant protection chemicals are undertaken mainly by governmental institutions. Organochlorine pesticides were not formulated in Turkey, thus serious contamination at production sites is not expected. To track what pesticides, and in what quantities entered in the country and where they were distributed is extremely difficult. Initial survey at the ministry indicated, that since the ban of these chemicals none of them were imported into the country. It confirms that POP pesticides should not be addressed as a matter of priority in the NIP development process.

The table below gives a summary of Turkey's status regarding the 12 POPs.

Name of pesticide	Situation in Turkey
DDT	Banned in 1985
Aldrin	Banned in 1979
Dieldrin	Banned in 1971
Chlordane	Banned in 1979
Endrin	Banned in 1979
Heptachlor	Banned in 1979
Hexachlorobenzene	Banned in 1979
Mirex	Not registered
Toxaphene	Banned in 1989
PCB's	Restricted for use in closed systems since 1996
A dioxins and furans emission limit value (0,1ng/m <sup>3</sup> ) was set for incinerators by the Hazardous Waste Control Act in 1999. Hexachlorobenzene emissions are neither controlled nor monitored.	

Since Integrated Pest Management has been introduced in Turkey, the Ministry of Agriculture and Rural Affairs has set up an information dissemination network. Farmers have easy access to information on pre- and post harvesting technologies and training programmes are organized for them.

As Malaria was eradicated from Turkey in the early twentieth century, emergency supplies of mosquito control chemicals are not kept in the country.

In 1993, PCBs were restricted for use in closed systems solely and were finally banned in 1996 by the Regulation on Dangerous Chemicals. The main electrical power supplier in Turkey is the Turkish Electricity Generation and Transmission Corporation (TEGTC). According to their information PCBs containing transformers are still in use. Before the early 90's used transformer oils were recycled with filtration or centrifuging resulting in PCB contamination. The number of contaminated transformers is unknown, thus an extensive survey is necessary to assess the magnitude of the problem. Since the recycling process was stopped, used oil was collected and



transported from the corporation by a private company. How that company dispose the waste oil is not known. However, since the mid-nineties imported cooling oils comply with the international guidelines and conventions, thus are PCB-free.

Extensive liberalization started in the energy sector in late 90's. State owned power plants were privatised and the power generation, transmission, trading and distribution sectors were separated. There are approximately 15 power-generating companies and a company, which is responsible for the transmission of the electric energy and which does not have transformers and capacitors. Additionally, the mining sector, the aluminium production plants and the steel industry are also potential PCB-users.

### **Detailed information on the stocks, and contaminated sites**

According to the last survey initiated by the Ministry of Environment, there are 10.930 kg DDT, 6.500 kg PCBs on stock in Turkey. There are also approximately 213 tons of PCBs, which are being used by Turkish Electricity Generation and Transmission Corporation. As mentioned earlier, there are many transformers, which may contain PCBs due to the previous recycling practices.

#### Contaminated sites

Environmental contamination with POPs chemicals has never been assessed in Turkey. Presumably PCB contamination occurred at the service sites of TEGTC where all the outdated and damaged transformers and capacitors are collected and dumped. The DDT stock site of the Ministry of Agriculture and Rural Affairs can also be a possible source of contamination. The Ministry of Health indicates reports of DDT poisonings. This shows that either there are serious contaminations in the environment or that DDT is still being used illegally.

Since the Ministry of Agriculture and Rural Affairs had the largest supply of POP pesticides, their former distribution facilities, such as warehouses, are possible spots for environmental contamination.

### **Assessment of disposal opportunities**

#### Land filling

Landfilling is the most common way of waste disposal in Turkey. Municipal landfill sites are found in the large cities.

#### Incineration

The only regulated hazardous waste incinerator for Turkey is located in Izmit. The capacity is 35,000 tons/year for incineration and 700,000m<sup>3</sup> for landfilling of industrial waste. Emissions of dioxins and furans are monitored. Sludge and ashes are landfilled.

Other incinerators in Turkey are as follows:

- Istanbul Municipal Waste Incinerator has the capacity of 24 ton/day.
- GATA Medical Waste incinerator (50 kg/h).
- Ankara University Medical Waste Incinerator (it is rarely used).
- Akdeniz University Medical Waste Incinerator (150 kg/h).
- Fethiye State Hospital Medical Waste Incinerator (50 kg/h).
- Sivas Su Sehri State Hospital Medical Waste Incinerator (50 kg/h).
- Kırıkkale Regional Hospital Medical Waste Incinerator (150 kg/h).

Cement Kilns are allowed to burn hazardous wastes, but as of today none of the kiln operating companies applied for certification for disposing of such substances. The reasons for that are the high cost of the testing operation and laboratory analysis, which proves that the emission limits are respected and the lack of continuous supply of hazardous waste.

#### Alternative technologies

Presently no alternative non-combustion technologies for POPs management can be found in the country.

### Detailed information on the releases to the environment

A study initiated by the Ministry of the Environment in 1996 assessed the number of the most significant industrial enterprises in Turkey, which give an indication of the industrial structure as follows:

Textile	>200
Food & meat processing	>200
Leather	>262
Pulp and paper	9
Cement production	7
Petroleum refining & petrochemicals	3
Fertiliser production	5
Thermal energy production	4
Small industrial installations	43
Organised industrial districts	6

### Detailed information on the regulatory control

The Turkish environmental management system was created as a consequence of the Third Five-year Development Plan (1973-1977). It was published in the Constitution of 1982 and the Environmental Law of 1983, among others. The constitution system and the institutional base were established before the Declaration of Rio in 1992 and Agenda 21 that advocate important changes in the protection of policies and environmental management systems. To this end, amendments are now being considered that could strengthen inspections, broaden public participation, promote more efficient collection of revenues that support the Environmental Pollution Prevention Fund, and better drinking water resources.

Within this framework, the national environmental action plan of Turkey has been completed with the intensive contributions from the related national institutions. In addition, national Agenda 21, which is about to be finalized, initiates the consensus among all related actors, private sector, central and local administrations, NGO's and outlines the targets for sustainable development.

Many of Turkey's environmental policies, laws and regulations are based on European and International legislation. For example, air pollution standards are based on German rules, and a number of regulations on waste management, including those on solid waste (1991), medical waste (1993), toxic chemicals and their products (1993), and hazardous waste (1995) are based on Western European guidelines. Several regulations have been put into action. The Regulation on Hazardous Chemicals provides framework for the determination of programmes, policies and principles regarding the control of dangerous chemicals in terms of production, packaging, storage, labelling and handling. In addition, the ISO 14000 standards on environmental management and the Eco-management and Audit System (EMAS) of the EU have been translated into Turkish and distributed among the private sector. However certain matters are still pending, such as:

- Regional directives to reduce the diversity of existing environmental legislation.
- A regional study to redefine effluent and emission standards on the basis of BAT and/or cleaner technologies.

Turkey's environmental legislation does not contain direct provisions for the promotion of best available technologies and/or cleaner technologies. An important practical consequence is that the numerical definition of effluent and/or emission standards does not relate to or reflect these technologies.

Regarding the Voluntary Regulation Mechanisms on Cleaner Production Issues, there is a Responsible Care programme run by the Chemical Manufacturers' Association to promote the voluntary adoption of CP criteria in which almost all the chemical manufacturing plants in Turkey are participating. The Istanbul Chamber of Industry and the Chemical Manufacturers' Association are acting together on environmental affairs.

A dioxin/ furan emission limit value of 0.1ng/m<sup>3</sup> was set by the regulation on the Dangerous Waste Control Act (25th September 1999, 23827) for hazardous waste, municipal waste, clinical waste incinerators and for all the facilities, which use halogenated chemicals as a fuel source. With the direction of the same regulation, oil and solvent wastes,

which contain PCBs less than 50ppm are recoverable.

The Ministry of Health is responsible for controlling the production, marketing, registration, and control of pharmaceuticals, cosmetics, food additives, and household pesticides. The Refik Saydam Hygiene Centre is a government research institute affiliated directly with the Ministry of Health. The mandates of the centre are controlling, diagnosing, production, training and research.

The Ministry of Agriculture and Rural Affairs is responsible for the production, marketing, registration, and control of agrochemicals. The Central Plant Protection Research Institute is affiliated with the Ministry of Agriculture and Rural Affairs. The Institute has been working on quality control of agrochemical formulation and resistance/efficacy of agrochemicals.

### **Monitoring of POPs**

Persistent Organic Pollutants have not yet been monitored in Turkey and there are no emission or pollution standards except for dioxins and furans. The regulation on Environmental Audits, which entered into force in 2002, aims to set up the legal instrument for regular environmental monitoring and inspections. The Environmental Reference Laboratory affiliated with the Ministry of Environment started its function in June 1998. The Laboratory has been carrying out the analysis of the items and /or pollutants specified in the Environmental Law and Regulations of Turkey. The capacity for dioxin and furan analysis is lacking.

Turkish Scientific and Technical Research Council-Marmara Research Centre (TUBİTAK-MAM), established in 1972 in Gebze near Istanbul, is the first multidisciplinary research centre of Turkey to bridge universities and the industry. TUBİTAK is the central organisation that comprises the different institutes and scientific and technical research centres in Turkey. Financial support is obtained from the World Bank through the Turkish Technology Development Foundation (TDF) and from the Undersecretariat for the Treasury and Foreign Trade. TUBİTAK-MAM is a section of TUBİTAK that carries out applied research and development. MAM has a staff of 1400, of which around 40% are researchers.

The areas of current research and development activities are: computer technology (electronics, multimedia, software systems and space technologies), energy systems and environmental research (energy conservation, new energy technologies, environmental control and assessment, environmental pollution control and environmental management systems), genetic engineering and biotechnology (molecular immunology, protein structure, plant biotechnology), nutritional science and technology, and chemical materials and technologies.

The Institute of Energy Systems and Environmental Research (ESERI) was established in 1996 through the merge of the Energy Systems and Environmental Research Departments. The activities of ESERI have been directed towards industry and applied research. Its clients are mostly governmental agents, municipalities, industrial plants and international organisations.

As a result of the promulgation of new standards and laws on resource conservation and the control of environmental pollution in keeping with global trends, ESERI has managed to occupy an optimal position and has acquired an important market share. The current trends in industry, together with quality management, are based on the implementation of environmental management systems. Advising enterprises on the implementation of environmental management systems is an important aspect of ESERI's work. ESERI focuses on pollution prevention and resource conservation in all industrial sectors in Turkey from the points of view of management, development and technological adaptation. Scientists from other institutes (textiles, food industry, materials, chemicals, etc.) collaborate in pollution prevention projects.

The Centre has laboratories for routine analysis seawater and wastewater quality. In addition, there many sophisticated analytical equipment in the centre. The Centre has decided to establish a dioxin/ furan analysis laboratory. Due to the high cost of the establishment of such facility, the Ministry of Environment strongly supports TUBİTAK MAM in setting up the first PCDD/Fs laboratory in Turkey. With the help of this institution the initial monitoring and R&D can be undertaken.

The LIFE Project, Strengthening Environmental Control in Turkey-Reinforcing the National Reference Laboratory of Gölbaşı, Ankara, has been made to strengthen the capacity of laboratory to function as the Environmental Reference Laboratory.

The Middle East Technical University in Ankara is carrying out researches on air and water pollution. The Chemistry Department was affiliated with projects for analysing POP pesticides in environmental samples. They have the necessary capacity to measure PCBs as well, but do not have the expertise.

Ministry of Agriculture and Rural Affairs has a testing laboratory, where food samples are analysed. Pesticide residues are also monitored.

### Human Health assessments

Organochlorine pesticides (OCPs) have been monitored among Turkish population in human adipose tissue samples by carrying out regional survey at given time intervals since 1976 ( Kayaalp 1979; Karakaya and Ozalp 1987; Cok et al. 1999). There are some studies reporting OCPs levels in mother milk in different regions of Turkey (Karakaya et.al.1987; Cok et.al.1997). One of the latest studies in human milk was done in 1997 (Cok et.al.) in the agricultural regions of Turkey. In this study, 104 human milk samples were collected from healthy donors living in two different regions of Turkey for at least 5 years. The age of mothers ranged from 17 to 44. The regions were selected on basis of similarities and differences in their environmental and socio-economic characters namely Manisa is an industrial and agricultural area located in the west of Turkey while Van is the agricultural and stockbreeding region located in the east of Turkey. Collected samples were analysed by GC. Residues of  $\alpha$ -BHC, $\beta$ -BHC, HCB, Heptachlorepoide, and pp'DDE were found to be the major contaminants in milk samples of Manisa and Van residences. Table-1 shows average levels of OCPs in milk from mothers in different regions of Turkey in different time intervals (mg/kg fat basis).

Table 1: Average levels of OCPs in milk from mother in different regions of Turkey (mg/kg fat basis).

City	Year	N	$\alpha$ BHC	$\beta$ BHC	$\gamma$ BHC	HCB	HE**	ppDDE	ppDDT	$\Sigma$ DDT	DDE/DDT	Ref
Sivas	1983	18	0.26	0.94	0.3	0.08	-	-	-	13.97	-	1
Ankara	84-85	61	<0.01	0.92	<0.01	-	-	2.71	0.42	3.66	6.45	2
Adana	84-85	52	<0.01	1.43	<0.01	-	-	8.55	1.17	10.57	7.31	2
Kocaeli	84-85	50	<0.01	0.72	<0.01	-	-	2.56	0.37	3.30	6.92	2
Kayseri	1989	51	0.096	0.522	0.156	0.084	0.011	2.39	0.41	3.07	5.61	3
Van	95-96	41	0.05	0.417	0.016	0.058	0.078	2.26	0.141	2.67	14.74	4
Manisa	95-96	63	0.067	0.355	0.017	0.044	0.069	1.85	0.072	2.15	17.45	4

$\Sigma$ DDT=1.115xp.p'DDE+p.p'DDT; \*\*Heptachlor epoxide

1-Cetinkaya et.al. 2- Karakaya et.al. 3-Burgaz et al. 4- Cok et al.

As shown in Table 1  $\Sigma$ DDT in milk tends to decrease gradually. The ratio of DDE/DDT in this study is as high as those found in the most developed and developing countries where DDT uses has been prohibited since 1970s (Table 2).

Table 2: Average OCPs residues in human milk from various countries ( $\mu$ g/kg whole milk)

Country	Year	p.p'DDE	p.p'DDT	DDE/DDT	Reference
Israel	1985	79.0	8.46	9.33	Weisenberg et al.1985
Italy	1985	1.4	0.25	5.6	Dommorco et al.1987
Canada	1987	29.22	2.45	11.92	Dewailly et.al.1989
France	1990-1991	21.83	0.79	7.3	Bordet et al.1993
Spain	1991	18.7	0.4	46.75	Hernandez et al.1993
Egypt	1993	21.37	2.93	7.3	Saleh et al.1996
Turkey	1995-1996	20.13	1.0	16.04	Cok et al.1997

**Table 3: OCPs levels in adipose tissue in Ankara (mg/kg fat basis).**

Region	Year	N	ΣBHC	ppDDE	ppDDT	ΣDDT	DDE/DDT	Ref
Ankara	76-77	41	4.20±0.73	10.2±0.64	3.20±0.63	14.6±1.38	3.19	1
Ankara	84-85	48	1.72±0.83	5.83±3.31	0.62±0.50	7.12±4.10	9.40	2
Ankara	91-92	60	1.54±1.04	3.72±3.59	0.27±0.32	4.42±4.16	13.77	3
Ankara	95-96	56	0.59±0.39	1.83±0.89	0.09±0.21	2.13±1.03	20.82	4

1-Kayaalp et.al.1979, 2-Kayaalp &Ozalp 1987, 3-Burgaz et al. 1994, 4- Cok et al.1997.

Since 1996, the increase in DDE/DDT ratio and decrease in ΣDDT and ΣBHC levels in adipose tissue demonstrate that the influence of restriction and prohibition of OCPs reduced the exposure of these compounds to humans (Table 3).

Adipose tissue samples were analysed from people, who live close to Manisa and 0.033 ppm (Cok et al.) HCB level was found, which indicates that possible contamination occurred in the past. The latest study by the same researchers screened 61 females by analysing 29 adipose tissue samples and 33 human milk samples. The samples were analysed by GC to assess the PCBs contamination among the selected population around Ankara. The results are shown in Table 4 and as additional information Table 5 indicates level of PCBs in human milk in other countries (Cok et.al. 2001).

**Table 4: Concentration of 7 PCB Congeners in human milk samples from Ankara (ng/g lipid)**

Structure	IUPAC No	Mean±SD	Range	%
2,4,4' Triclorobihenyl	28	5,7±16,8	0,0-35,4	18,8
2,2,5,5' Tetraclorobihenyl	52	10,3±21,3	0,0-55,7	25
2,2,4,5,5' Pentaclorobihenyl	101	6,6±25,2	0,0-71	9,4
2,3,3',4,4' Pentaclorobihenyl	118	18,9±48,4	0,0-313,3	18,8
2,3,3',4',5 Hexaclorobihenyl	138	64±124,4	0,0-329	46,9
2,2',4,4',5,5' Hexaclorobihenyl	153	110±141,1	0,0-416,5	56,3
2,2',3,4,4',5,5' Heptaclorobihenyl	180	59,8±101,5	0,0-266	46,8

**Table 5: Comparison of PCBs contamination in human milk from Turkey (Ankara) with other countries (PCBs expressed in ng/g fat)**

Country	28	52	101	118	138	153	180	Ref
Great Britain (1991) (n=32)	31,5	26,2	15	28,6	68,1	85,9	74,9	6
Czech Rep.(1996) (n=17)	nd	nd	nd	28,5	289	379	240,2	7
Germany (1995) (n=68)	17	13	14	*	168	240	173	8
Norway (1994) (n=28)	7,8	*	1,1	26,2	86,8	114,4	50,6	9
Canada (1996) (n=536)	*	*	*	*	46	54	27	10
Ukraine (1999) (n=197)	14	18	23	93	134	149	55	11
Belgium (2000) (n=46)	2,8	2,7	3,0	57,1	68,3	145,3	93,7	12
Poland (1994) (n=20)	13	1,7	4,2	71,0	230	290	175	13
Turkey (2000) (n=32)	5,7	10,3	6,6	18,9	64	110	59,8	14

nd: below the limit of quantification, \* not analysed,

Experts from the Ministry of Health and the Gazi University confirmed that people who worked or still working with the POPs compounds –mainly PCBs – are not aware of the safety regulations, thus changing the transformer oils without gloves and proper protection.

#### References:

- 1.Karakaya et al: Bull.Environ.Contam.Toxicol.39:506-510,1987.
2. .Karakaya et al: Bull.Environ.Contam.Toxicol.38:941-945,1987.
3. .Cok et al: Bull.Environ.Contam.Toxicol.61:311-316,1998.

4. Cok et al: Bull.Environ.Contam.Toxicol.59:577-582,1997.
5. Burgaza et al: Bull.Environ.Contam.Toxicol.53:501-508,1994..
6. Duarte-Davitson R et al: Chemosphere, 23:119-131, 1991
- 7.Schoula R et al: Chemosphere 33: 1485-1994, 1996.
8. Georgii S et al: Bull.Environ.Contam.Toxicol.,54:541-545,1995.
9. Jahansen HR et al: J.Toxicol.Environ.Health., 42:157-171,1994.
10. Dewailly E et al: Am.J.Public.Health,86:1241-1246,1996.
- 11.Gladen Bc et al: Environ.Health.Perspect.,107:459-462,1999.
12. Pauwels A et al: Arc.EnvironContam.Toxicol., 39:265-270,2000.
- 13.Falandysz et al: The Science of Total Environ., 149:113-119,1994.
- 14.Cok et al:Eorotox 2001,13-16 September,2000 Istanbul, Turkey.
15. Cok et al. Bull.Environ.Contam.Toxicol (in press) 2002