United Nations Development Programme
United Nations Industrial Development Organization
Global Environment Facility
Country: Republic of Turkey
PROJECT DOCUMENT

Brief Description

The objective of the project is to protect human health and the environment globally as well as locally through addressing POPs legacies including elimination of POPs Pesticide and PCB stockpiles, and initiating clean up of associated POPs and chemical pollutant contaminated sites, as well as dealing with longer term PCB phase out consistent with the country's Stockholm Convention obligations, reducing U-POPs release in major industrial sectors , and providing targeted institutional, regulatory and technical capacity strengthening, all within a sound chemicals management framework. The project is directed by the Ministry of Environment and Urbanization. It will meet this objective by eliminating a large POPs pesticide stockpile consisting of 3,000 t of pure HCH and associated high concentration POPs waste and at least 350 t of PCB stockpiles as well as supporting assessment, cleanup and monitoring of priority POPs contaminated sites involving representative range of site contamination situations, remediation approaches and clean-up financing modalities.. The project will also demonstrate the sustainable treatment of up to 150 cross contaminated PCB transformer units by means of de-halogenation technologies, will provide technical assistance for setting up a national plan for treatment of PCB contaminated transformers, and will provide technical assistance for the establishment of BAT/BEPs among priority U-POPs emitting sectors Additionally the project will support the qualification of needed hazardous waste infrastructure and national technical capability for the ongoing management of POPs and other chemical hazardous wastes as well as supporting the strengthening of institutional and regulatory capacity within an overall chemicals management framework.

Project Title: POPs Legacy Elimination and POPs Release Reduction Project

UNDAF Outcome(s): *Outcome 2 Democratic and Environmental Governance*

Expected CPAP Outcome(s): UNDP: OUTCOME 3: Strengthening policy formulation and implementation capacity for the protection of the environment, and cultural heritage in line with sustainable development principles and taking into consideration climate change and disaster management.
Expected CPAP Output(s): UNDP: OUTPUT 3.3.8: Protection of health and environment through elimination of current POPs legacies, ensure longer term capacity to manage POPs into the future consistent with international practice and standards, and integrate POPs activities with national sound chemicals management initiatives.

Implementing Partner: Ministry of Environment and Urbanization (MoEU)

Responsible Partners: United Nations Development Programme, United Nations Industrial Development Organizations

Programme Period:	2015-2019
Atlas Award ID:	UNDP - 00082077
Project ID:	4601
PIMS #	4833
UNIDO ID:	100292
Start date:	TBUpdated
End Date	TB Updated
Management Arrangements	National (NIM)
LPAC Meeting Date	4 Nov.2014

Total resources required	$91,344,583
Total allocated resources:	$91,344,583
○ Regular (UNDP)	$100,000
○ Regular (UNIDO)	$38,000
○ GEF	$10,815,000
○ Other:	
○ Government (in-kind)	$19,070,000
○ Government (cash)	$100,000
○ UNDP (in-kind)	$270,000
○ UNIDO (in-kind)	$120,000
○ Other	$60,831,583

Agreed by the Ministry of Environment and Urbanization of the Republic of Turkey: 21.04.2015

Signature Date/Month/Year

Agreed by Ministry of Foreign Affairs of the Republic of Turkey

Signature Date/Month/Year 21.05.2015

Agreed by *Philippe R. Scholtès*
Managing Director,
Programme Development and Technical Cooperation Division (PTC),
UNIDO GEF Focal Point: 24 / 03 / 2015

Signature Date/Month/Year

Agreed by *Kamal Malhotra*,
UNDP Resident Representative in Turkey: 20 / 03 / 2015

Signature Date/Month/Year

Table of Contents

List of Tables

List of Figures

List of Acronyms

ADR — International Carriage of Dangerous Goods by Road

APC – Air Pollution Control

BEP/BAT — Best Environmental Practice / Best Available Techniques

BOF - Basic Oxygen Furnace

BREF – Best Available Techniques Reference Document

CCME – Canadian Council of Ministers of the Environment

COP – Conference of Parties

CSCS - Contaminated Sites Clean-Up System

CSES - Contaminated Sites Evaluation System

CSIRS - Contaminated Sites Identification and Registration System

DE – Destruction Efficiency

DRE – Destruction Removal Efficiency

EA – Environmental Assessment

EAF – Electric Arc Furnace

EHS – Environment Health and Safety

EIA – Environmental Impact Assessment

EIS - Environmental Information System

EMP - Environmental Management Plan

ENGO – Environmental Non-Government Organization

EOI – Expression of Interest

EÜAŞ - Turkish Electricity Generation Company

EU – European Union

EUR - Euro

FAO – Food and Agriculture Organization of the United Nations

FSP – Full-sized Project

GC – Gas Chromatograph

GDP- Gross Domestic Product

GEB – Global Environmental Benefit

GEF — Global Environment Facility

GHG - Greenhouse Gases

HCH - Hexachlorocyclohexane (lindane)

HTI – High Temperature Incineration

HW – Hazardous Waste

IDB – Islamic Development Bank

IEHS - Integrated Environmental Harmonization Strategy

INC - Intergovernmental Negotiation Committee

IPA - Instrument for Pre-accession Assistance

IPPC – Integrated Pollution Prevention and Control

İSTAÇ - İstanbul Municipality Environmental Protection and Waste Management Company

İZAYDAŞ - İzmit Waste Storage and Incineration Company

MEAs – Multilateral Environmental Agreements

MESS - MESS Integrated Recycling and Energy Inc.

MoFAL – Ministry of Food, Agriculture and Livestock

MoEU – Ministry of Environment and Urbanization

MoFWA - Ministry of Forestry and Water Affaires

MoH – Ministry of Health

MTE and FTE – Mid-term and final evaluations

NIP — National Implementation Plan for the Stockholm Convention

NGO — Non Governmental Organization

OCP- Organochlorine Pesticide

OPs – Obsolete Pesticides

PAH – Polyaromatic Hydrocarbon

PCB – Polychlorinated biphenyl's

PCDD/Fs — Dioxins and furans

PIC - Prior Informed Consent

PIF – Project Identification Framework

PIU — Project Implementation Unit

POPs — Persistent Organic Pollutants

PPP – Public Private Partnership

PPE - Personal protective equipment

REACH – Registration, Evaluation, Authorization and Restriction of Chemicals

SAICM – Strategic Approach for International Chemicals Management

SC – Stockholm Convention

SWM – Solid Waste Management

TIKA - Turkish Cooperation and Development Agency

TL – Turkish Lira

TOR — Terms of Reference

TEDAŞ - Turkish Electricity Distribution Company

TEİAŞ - Turkish Electricity Transmission Company

TÜBİTAK - Turkish Scientific and Technological Research Institution

TÜBİTAK-MAM - Turkish Scientific and Technological Research Institution – Marmara Research Centre

TURKAK – Turkish Accreditation Agency

UN – United Nations

UNDP — United Nations Development Programme

UNEP — United Nations Environment Programme

UNIDO- United Nations Industrial Development Organization

UNOPS – United Nations Organization for Project Services

USEPA – The United States Environmental Protection Agency

U-POPs — Unintentionally Produced Persistent Organic Pollutants

WHO — World Health Organization

I. Situation analysis

General country context and information

The Republic of Turkey is an upper middle income country with a rapidly modernizing industrial economy that is generally on track to join the European Union and to graduate to the status of a fully developed and donor country. However it still has challenges respecting environmental issues and legacies that need to be aggressively addressed as the country moves to this status and is a major motivation behind this project.

Turkey is located in both Europe and Asia. It includes an extension of the European Balkan Peninsula (the region of Thrace) and the Asian Anatolia peninsula with the Dardanelles and Bosporus separating them as well as linking the Black and Aegean Seas. Country is surrounded from 3 sides by Mediterranean, Black Sea, Aegean Sea and Sea of Marmara which is between Black Sea and Aegean Sea. Neighbouring countries are Greece, Bulgaria, Georgia, Armenia, Azerbaijan (Republic of Nakhchivan Aautarchic), Iran, Iraq and Syria. Its capital is Ankara. Turkey is separated to 7 geographic regions. These are Mediterranean, East Anatolia, Aegean, South Eastern Anatolia, Central Anatolia, Black sea and Marmara regions

The country has a total land area of 783,562 km^2 making it the 37^{th} largest country in the world. Average elevation of the country is 1,132 m with the North Anatolian Mountains in north and Taurus Mountains in the south, southeast and east sides of Turkey. The elevation level generally increases from west to east therefore; the highest elevation level is at the east side of Turkey with Mount Ararat on the Armenian border in the East is the highest mountain of the country at an elevation of 5,165 m. The largest natural lake is Lake Van. The Fırat, Dicle, Aras and Kura Rivers rise within Turkey but flow through borders to other countries. The largest river rising within Turkey and flowing entirely with the country is the Kızılırmak River.

The Aegean and Mediterranean coasts are characterized by hot and dry in summer, warm and rain in winter. The Black Sea coast has a temperate climate and with rain distributed throughout the year (2,000-2,500 mm/year). The Marmara Sea coast shores located between Aegean and Black Seas is a transitional area between the two coastal climate regions and the continental climate characteristic of Central Anatolia, Southeast Anatolia and East Anatolia. In these areas wide temperature differences occur between day and night and with the season. It is hot and dry in summer and cold and snowy during winter. The most severe weather conditions are observed in Eastern Turkey. In East Anatolia temperatures can decrease down to -40°C and snow is present at least 120 days in a year. Average temperature in west is 1°C. However, it is hot and dry in summer. All across the country usually the driest months are July and August as the temperature can get over 30 °C during the day, and the most rain occurs in May.

Turkey[1] is the world's 17th and Europe's 6th largest economy and is currently the fastest emerging market in Europe and OECD. Turkish GDP grew by 8.8% in 2011, making the country the fastest growing economy of Europe and the average growth rate in the last decade was 5.1%, the fastest among the OECD countries. Turkey's Purchasing Power Parity adjusted GDP for the year 2011 was $1.1 trillion having more than tripled since 2003. Similarly, GDP

[1] Turkey: Key Facts on Turkey's Economy – May 2013, http://opentoexport.com/article/turkey-key-facts-on-turkeys-economy-may-2013-2/

per capita has nearly tripled since 2002, from $3,500 to $10,504 placing it in the range of newer EU countries.

Turkey is one of the world's biggest markets with a population of 76 million, half of which is below the age of 30, and a labour force of 28 million, giving it the highest youth population and 4th largest labour force relative to EU-27 countries. Turkey's net debt to GDP ratio is 39% as of the end of 2011, which is well below the Maastricht Criterion of 60%. The country has been meeting the Maastricht Criterion on public debt since 2004. Similarly, Turkey's budget deficit/GDP ratio is 2%, one of the lowest rates in Europe. Turkey's export volume was $152bn in 2012, more than quadrupling since 2002. Turkey's major export partners in 2012 were Germany (10%), Iraq (7%), Iran (6.5%) and the UK (5.7%), while major import partners were Russia (11%), Germany (9%), China (9%) and USA (6%).

Turkey is one of the fastest growing energy markets in the world with the demand for electricity estimated to grow at an annual 6% between 2009 and 2023 with investments to meet the energy demand in Turkey over the next 10 years estimated at around USD 130 billion. With respect to renewable energy, it ranks 1st in the world in terms of growth rate in wind energy plants and only 15% of its potential has been utilized. The tourism sector is one of the biggest in the world with more than 31 million visitors in 2012 ranking it as the 6th most visited country in the world. The Mediterranean resort of Antalya is rated as being among the top 5 tourist destinations of the world, Istanbul is the 3rd mostly visited city in Europe, after London and Paris, Turkey has 22 out of the world's 100 best hotels. Turkey has a very large and rapidly growing real estate sector and is among the most attractive land and development investment locations in Europe, something when combined with tourism is creating significant development demand for higher value coastal land currently in industrial use.

With respect to manufacturing, Turkey is the 6th largest ready to wear clothing manufacturer in the world and the 2nd largest supplier to the EU, the 2nd largest producer of footwear in Europe (after Italy) and 4th largest exporter of leather goods and apparel to Europe. 33 Turkish construction companies are among the top 225 contracting companies in the world and overall the country ranked second in the world in 2012 after China. Turkey is the largest commercial vehicle and bus manufacturer in Europe and the 16th largest automobile producer of the world with 1.2 million vehicles being were produced , 67% of which were exported. It is one of Europe's leading home appliances manufacturers with a production capacity of more than 25 million units per year, which is the second largest capacity in Europe after Italy, and is the number one TV manufacturer in Europe with over 50% of European production. The Turkish ICT sector grew by 14% between 2005 and 2010 with rapidly expanding e-commerce markets and high mobile device usage. In the agro business sector, Turkey is the world's 7th largest producer of fruits and vegetables, Europe's largest and the world's 3rd largest frozen fruit exporter, and has the largest milk and dairy production in its region. Turkey is Europe's 2nd largest iron and steel maker and the world's leading producer of construction iron and is the world's 4th largest mega-yacht manufacturer and 5th largest shipbuilding country.

Turkey is a democratic, secular, constitutional republic based on a democratically elected parliament and President. The President is elected by direct vote for a five year term. The executive government functions under a Prime Minister and Council of Ministers with the Turkish Grand National Assembly holding the legislative responsibilities and Courts judicial responsibility. Turkish Grand National Assembly consists of 550 parliamentarian and they are elected for 4 year terms. Below the national level there are 81 provincial administrations.

Within a province there are local governments at the city, county and villages within counties. The executive branch appoints Governors who are in charge of administration and execution in a province.

Turkey is a member of the United Nations, with most of its agencies having active programs in the country, and other global organizations including the World Trade Organization and Organization of Economic Cooperation and Development (OECD). Regionally, it is a member of the Council of Europe, the Organization of Black Sea Economic Cooperation and Islamic Collaboration Organization. It is also a member of NATO Membership is also held in several International Financial Institutions (IFIs), including the International Monetary Fund (IMF), International Bank for Reconstruction and Development (IBRD), International Finance Corporation (IFC), European Bank for Reconstruction and Development (EBRD), Asian Development Bank (ADB) and Islamic Development Bank (IDB). Additionally, Turkey hosts delegations and active programs from the Organization for Security and Cooperation in Europe (OSCE) as well as many bilateral assistance organizations through national diplomatic delegations. Turkey has been an associate member of European Economic Community since 1963, a member of the European Customs Union since 1995, and is in the process of negotiating to be a full member of European Union.

Turkey participates in the multilateral economic dialogue with the EC and Member States to prepare the country for participation in multilateral surveillance and economic policy coordination under the EU's Economic and Monetary Union. Bilateral trade between the EU and Turkey totaled €123 billion in 2012. Turkey continues to be the EU's sixth biggest trading partner, while the EU is Turkey's biggest. 38% of Turkey's total trade is with the EU and almost 71% of foreign direct investment in Turkey – with a strong high-technology component – comes from the EU.

Approximately €903 million in overall financial assistance have been earmarked for Turkey for 2013 from the Instrument for Pre-accession Assistance (IPA). The next Financial Framework (2014-20) for the overall IPA program is currently being finalized and implemented with an emphasis on a more sector integrated approach to programming IPA financial assistance. The government and the EC are currently preparing a comprehensive Country Strategy Paper for the period 2014-2020, which will provide a coherent and strategic framework for financial assistance under the new Instrument for Pre-Accession Assistance (IPA II). Part of this process in relation to the environmental sector has involved integration of EU assistance with other international assistance, particularly that of the GEF-5 and GEF-6 with the current project serving as both stimulus and a synergistic pillar in developing new initiatives and guiding those currently under implementation.

As it is indicated in the 10th Development Plan of Turkey, "Despite these achievements, pressure on environment caused by economic growth, population growth, production and consumption patterns continues. Planning, implementing, monitoring and supervising in environmental and natural resources management should be enhanced. There is a need for removal of authority overlapping and strengthening of cooperation among institutions. Improving financial sources for environmental investments, using these sources efficiently and strengthening the mechanisms that will ensure prevention through evaluating the impacts of projects and programs that may have serious effect on environment, are needed. R&D and innovation on environment friendly method and technologies are also important, especially in terms of supporting economic growth" (par. 1030). Additionally, as part of the land management objectives, the 10th Development Plan recognizes that, "Use of land resources in

line with their capabilities and land use planning are still important. Effective implementation of prepared strategy documents and action plans on combating desertification and drought, enhancing efforts for combating erosion, prevention of pollution, strengthening of coordination in land management and thereby protection and rational use of land are priorities" (par. 1046).

Strategic environmental policy

Consideration of environmental matters was first introduced in Turkey's 1982 Constitution under Article 56 that prescribes that living in a balanced and healthy environment is a right with improving environmental conditions, protecting environmental health and preventing environmental pollution being the duty of both the government and citizens. This led to the enactment of the Environmental Law (No. 2872) on August 11th 1983. This Law aimed to establish a legal framework on protecting the environment, prevent pollution, rehabilitate the environment from any former pollution, improve environmental conditions, use natural resources and energy efficiently, reduce of the waste amount at the source generated as a result of an activity and recovery of the waste generated via using environmentally sound technologies, regulate and take measures to sustain good environment conditions for the next generations. The Environmental Law was updated in 2006 (Law on Amendments on the Environmental Law, No. 5491, issued May 13th 2006). This specifically placed more emphasis on environmental management, public awareness and education on environment as well as establishing a linkage respecting compatibility with international agreements and with current concepts related to sustainable development. It also expanded the scope of regulations to be enacted and definitions that were not addressed in original Environmental Law.

Turkey has a 5 year economic development planning cycle with 10 such plans having been put in place since initiation of this process in 1963 including the current development plan that came into effect in 2014. Integration of environmental policies and issues was limited in the early plans although acknowledged and in the third Plan (1974-78) included a dedicated chapter on environmental issues with mention of the importance of public awareness and the assessment of environmental issues but retention of an emphasis on environmental policy not conflicting with industrial development. However, the fourth plan explicitly indicated that Turkey's National Environmental Policies are to be compatible and in coherence and compliance with the international decisions and responsibilities. As it is indicated in Turkey's 10th Development Plan (2014 - 2018) rapid population increase, urbanization, economic activities, diversified consumption patterns increase the pressure on environment and natural resources. Environmental pollution, climate change, desertification, deforestation, water scarcity and problems caused by global warming remain on the global agenda. Development policies in Turkey show a progress towards development. Turkey contributes to the solutions of global environmental problems under the "common but differentiated responsibilities" and "comparative advantages" with an understanding of country's realities. The National Rural Development strategy for Turkey (2006) also prioritizes management of natural resources, which it states is a key to overcoming rural and urban disparities**.**

National environmental policy and strategies are now also substantially guided by National Environmental Strategy adopted for the years 2007-2023 and associated EU Integrated Environmental Harmonization Strategy (IEHS) which are both designed to be consistent with and integrated with the prevailing Development Plans. The IEHS in particular contains detailed information on the technical and institutional infrastructure, compulsory environmental amendments and regulations that have to be addressed to implement and comply

with EU environmental acquis which is a prerequisite for Turkey to join EU. To achieve this, IEHS states the goals to achieve, strategy and activities planned on control of water, soil, air pollution originated from wastes and industries, protection of nature and environment all of which are to be integrated into any development activity. In this framework, the total amount of investment is estimated as 59 Billion Euro in environmental protection to fully comply with EU environmental standards excluding specific investment requirements for the chemicals sector and regulation of POPs. This gap in the IEHS is being addressed in current planning of harmonization initiatives, specifically the updated EU IPA program noted above with the leveraging GEF programs provide. The 20% of the total investment is considered to be invested by the private sector and the rest is considered to be by the public sector.

With regard to Turkey's participation in multilateral environmental agreements (MEAs) associated with sound handling of dangerous chemicals and wastes, the following table provides information on participation, signing and ratification status by the Government of Turkey:

Table 1. International conventions and multilateral agreements signed, ratified and acceded to by Turkey

Multilateral Environmental Agreement	Participation/ Signing Status	Ratification/ Accession (a)	Responsible National Institution
Stockholm Convention on Persistent Organic Pollutants	May 25/2001	Oct. 14/2009	MoEU
Basel Convention on the Trans-boundary Movement of Hazardous Waste and their Disposal	Mar. 22/1989	June 22/1993	MoEU
Rotterdam Convention on Prior Informed Consent for Certain Chemicals and Pesticides in International Trade	Sept. 11/ 1998	Pending	MoEU
Minamata Convention on Mercury	Pending		MoEU
Vienna Convention	n/a	Sept 20/1991(a)	MoEU
Montreal Protocol	n/a	Sept. 20/1991 (a)	MoEU
– London Amendment to the Montreal Protocol	n/a	April 13/1995	MoEU
– Copenhagen Amendment to the Montreal Protocol	n/a	Nov. 10/1995	MoEU
– Montreal Amendment to the Montreal Protocol	n/a	Oct. 24/2003	MoEU
– Beijing Amendment to the Montreal Protocol	n/a	Oct. 24/2003	MoEU
Development of a National Profile on chemicals management, (SAICM implementation)	n/a	n/a	MoEU
Convention on Trans-Boundary Effects of Industrial Accidents	n/a	n/a	MoEU
UNECE European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)	n/a	Feb. 22/2010 (a)	MoT
UNECE Convention on Long-Range Trans-boundary Air Pollution	Nov. 13.1979	April 18, 1983	MoEU
– Aarhus Protocol on Persistent Organic Pollutants	n/a	n/a	MoEU

– Aarhus Protocol on Heavy Metals	n/a	n/a	MoEU
Convention on Access to Information, Public Participation in Decision Making, and Access to Justice in Environmental Matters	n/a	n/a	MoEU
– Protocol on Pollutant Release and Transfer Registers	n/a	n/a	MoEU
ESPOO Convention on Environmental Impact Assessment in a Trans-boundary Context	n/a	n/a	MoEU
– Protocol on Strategic Environmental Assessment	n/a	n/a	MoEU
UN Framework Convention on Climate Change	n/a	Feb. 24/2004 (a)	MoEU
– Kyoto Protocol	n/a	April 25/2003	MoEU
UN Convention to Combat Diversification	n/a	May 28/2009 (a)	MoFWA
Convention on Biological Diversity	June 11/1992	Feb.14/1997	MoFWA
– Cartenga Protocol on Bio-safety	May 24/2000	Oct. 24/2003	MoFWA

National institutional and legislative framework - chemicals management, hazardous waste management, and releases to air and water

The principle institutional responsibility for chemicals and hazardous waste management as well as releases to the environment, all including POPs lies with the MoEU at the national level and through its regional enforcement arms at the provincial level. The overall responsibilities of MoEU relevant to chemicals and hazardous waste management in the context of POPs elimination include: i) coordination of policies and strategies regarding prevention of environmental pollution; ii) developing standards and benchmarks; iii) preparing programmes on pollution mappings, education, research, planning and action plans; iv) determination and monitoring implementation on the above; v) organisation of work and process on climate change; vi) determine and assess the environmental impacts of facilities or activities that have or may have solid, liquid and gas waste releases to the environment; vii) monitoring of the environment; viii) permit and audit such facilities or activities; and ix) provide control of the noise release from the relevant activities.

Other national institutions having a role in chemicals and hazardous waste management in the context of POPs elimination are:

- Ministry of Forestry and Water Management (MoFWA) –- Co-ordination and control related to national water resources management; policies for protecting water resources for sustainable use of water; monitoring of water discharges and water bodies as well as related standards setting. In addition, the GEF Operational Focal Point is resident in MoFWA.
- Ministry of Science Industry and Technology - Determination of industrial strategies and aims by constituting industrial committees and monitor the studies on these subjects.
- Ministry of Economy - Ensuring high level legislative harmonization between the product safety, technical regulations, technical obstacles, technical suitability assessment and monitoring of the applications and adapting technical legislation in coordination with relevant institutions all in the context of foreign trade.

- Ministry of Energy and Natural Resources - Supervision of the equipment and associated chemical wastes used in distribution and production of electricity and ensuring implementation of relevant precautions.
- Ministry of Food Agriculture and Livestock (MoFAL) - Control, regulation, licensing and monitoring of registration, production, import, export, sales, use and storage of agricultural chemicals.
- Ministry of Customs and Trade - Consumer protection related to goods that pose or may pose a hazard to the environment; preparing quality control and quality checking systems to raise the quality of food; control of the chemicals that are coming in and going out of the country; and enforcement of relevant legislation with respect to the import and export of the chemicals.
- Ministry of Development - Development of public investment policies and plans; integration of environmental consideration into these; approval of specific public sector investment related to chemicals and hazardous waste management and site clean-up.
- Ministry of Health- Development of sectoral health policies, implementation of national health strategies, investigation of the effects of chemicals on human health after short and long term exposure.
- Ministry of Labour and Social Security - Monitoring of occupational health and safety issues, auditing, policy development and planning, developing health and safety units and certifying the practices, all inclusive of handling of hazardous materials and wastes.

Table 2 below provides a list of legislation and regulatory measures governing chemicals and hazardous waste management as well as related air and water releases.

Table 2: Legal Acts and Regulatory Measures Governing Chemicals Management, Hazardous Waste Management, and Air and Water Releases

Legal Act Name	Adoption date/ No.	Responsibility	Application to POPs and Chemicals Management
General Environmental Legislation			
Environmental Law	No. 2822, August 11/1983	MoEU	Article 2: defines the hazardous chemicals. Article 13: MoEU authority determines the principals of identification, production, import, export, areas and amounts of use, labelling, classification, storage, risk assessment and transport of the hazardous chemicals. Article 20 subparagraph (y): Penalties to be paid when the hazardous chemicals or article containing hazardous chemicals are produced, used, imported, exported, labelled, packaged, transported, stored, sold or put on market not carried out as stated by the related legislations or regulations. Provisional Clause 2: Chemicals importation is subjected to MoEU's approval before the effective date of legislation.

Legal Act Name	Adoption date/ No.	Responsibility	Application to POPs and Chemicals Management
Law on Amendments on the Environmental Law	May 13.2006, No. 5491	MoEU	No amendments related to chemicals
Law on Stockholm Convention on POPs ratification	April 4/2009. No. 5871	MoEU	Stockholm Convention on POPs is approved
Chemicals Management			
Regulation on Chemicals' Inventory and Control	December 26/2008, No. 27092	MoEU	Provides for reporting on collection on chemicals' production, import and information sharing along with the assessment of the risk caused by the chemicals.
Regulation on Classification, Labelling and Packaging of Hazardous Substances	December 26/2008, No. 27092	MoEU	Management and control of classification, labelling and packaging of hazardous substances
Regulation on Preparation of MSDS Forms and Distribution	December 26/2008, No. 27092	MoEU	Principles on MSDS Form preparation and distribution for protection of environment and public health
Regulation on Production, Sale and Use of Some Hazardous Substances and Articles	December 26/2008, No. 27092	MoEU	Restricts and bans various chemicals production, use, import and export including PCB and PBBs
Regulation on Control of Major-Accident Hazards in Industries Involving Dangerous Substances	August 18/2010, No. 27676	MoEU/MoT	Basic principles and methodologies to prevent major accidents involving dangerous substances including those associated with chemicals and POPs
Regulation on Control of Plant Protection Products	May 5/2011, No. 27939	MoFAL	Article 26 of the regulation states that the pesticides which have non-verified certificates cannot be produced, imported or exported. The POP-Pesticides are listed or continued to be listed under the regulation which are subjected to either being phased out or banned.
Regulation on Retail, Wholesale and Storage of Plant Protection Products	March 10/2011, No. 27870	MoFAL	Article 15 bans the wholesale, retail and storage of all banned pesticides including POP-Pesticides.
Law on Veterinarian Services, Plant Health, Food and Animal Feed	June 6/ 2010, Law No. 5996, No. 27610	MoFAL	Article 18 bans the production, import and sale of pesticides if any adverse effect on human, plant, animal and environment. Banning or phasing out of the pesticides listed or will be listed in Stockholm Convention are under the provision of this Law.
Turkish Food Codex 2008/26 numbered Declaration on Food Contaminants Maximum Limit Values	March 17/2008, No. 26879	MoFAL	Annex 6 of the Declaration sets limit on food contamination including chemicals and specifically PCDD/F and dioxin like PCB levels
Regulation on Cosmetics *	May 23/2005, No. 25823	MoH	Article 7 bans the use of α-HCH in cosmetic products

Legal Act Name	Adoption date/ No.	Responsibility	Application to POPs and Chemicals Management
Declaration on Control of import of Chemicals which are monitored to protect the Environment	December 31/2013, No.28868	MoH	Annex 1 lists the chemicals to be controlled including PCBs
Waste Management/Hazardous Waste Management			
Regulation on Hazardous Waste Control	March 14/2005. No. 25755	MoEU	Basic principles of hazardous waste regulation including POPs and chemicals waste
Regulation on Control of Equipment containing PCB-PCT	December 12/2007, No. 26739	MoEU	Regulation of identification, use and disposal of Articles containing PCBs.
Regulation on Waste Oil Control	July 30/2008, No. 26952	MoEU	Limiting the amount of PCB in the waste oil, prevention of firing of these oils and disposal of the oil in an environmentally sound manner
Regulation on Control of Soil Pollution and Sites Contaminated by Point Sources	June 6/2010, No. 27605	MoEU	Sets basic principles, limits and methodologies to determine the possibly contaminated or contaminated sites, cleaning methodologies and monitoring of the sites.
Regulation on Control of Waste Electric and Electronic Equipment*	May 22/2012, No. 28300	MoEU	Controls methods and principles of disposal of the waste electric and electronic equipment including consideration of POPs chemicals contained in them.
Regulation on Principles of Waste Management	July 5/.2008, No. 26927	.MoEU	States the basic principles of waste management including chemical and hazardous waste
Regulation on Landfilling of the Wastes	March 26/2010, No. 27533	MoEU	Regulates the landfilling of waste generally including hazardous waste
Regulation on Incineration of Waste	October 06/2010, No. 27721	MoEU	Regulates the incineration of waste including hazardous waste
Air and Water Releases			
Regulation on Control of Pollution in Aquatic Environment Caused by Hazardous Substances	Nov. 11/2005, No. 26005	MoEU/MoFWA	Governs water pollution including that caused directly by chemicals, POPs and POPs contaminated waste and its reduction
Regulation on Air Pollution Caused by Industries	July 3/2009, No. 27277	MoEU	Control of air pollutant emission limits including of PCDD/F and PCB from various industrial applications
Regulation on Management of the Quality of Surface Waters	November 30/2012, No.28483	MoFWA	Sets the limit values of pollutants in surface waters (environmental quality standards) including hazardous chemicals and POPs, covers monitoring in water and sediment.
Regulation on Monitoring of Surface Waters and Groundwater	February 11/2014, No. 28910	MoFWA	All surface and ground water are to be monitored for quality and quantity according to the monitoring

Legal Act Name	Adoption date/ No.	Responsibility	Application to POPs and Chemicals Management
			programmes prepared with this Regulation

Current Situation with respect to POPs and the Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs) was opened for signing in May 2001 with the objective of protecting human health and the environment from annexed POPs chemicals and wastes. It entered into force in May 2004 and has been subject to a number of amendments since that time including the addition of a number of annexed POPs to the original twelve. According to Article 7 of the Convention, Parties are required to develop National Implementation Plans (NIP) to demonstrate how they intend to implement obligations assumed under the Stockholm Convention. According to existing rules, each Party should develop and submit the NIP within two (2) years from ratification and update NIPs within every five years thereafter taking into account amendments and additional listed POPs.

Turkey signed and ratified the SC in 2001 and 2009 respectively. The first NIP, prepared with GEF assistance[2], addressing the inventories and strategic action plan for the initial twelve (12) POPs, was developed by the Ministry of Environment and Forestry[3] in the period 2007-2010, and officially transmitted to the Stockholm Convention's Secretariat on April 5, 2011[4]. Currently Turkey has developed draft of updated NIP with GEF assistance along with UNIDO to reflect the current status of POPs management and address the new annexed POPs included in the amendments to the SC that came into force in 2010. The updated NIP has been completed in final draft form[5] and is in the formal national endorsement process. Submission to the Convention Secretariat is expected in 2015. The draft NIP update contains a comprehensive concordance table correlating SVC provisions and obligations with current Turkish legislation (Table 2) as a well as an action plan to fill any gaps that exist. Turkey does not hold any specific exemptions nor has registered for any declared acceptable purposes under the provisions of the SC. The country is current with SC second round reporting requirements[6].

With respect to Multi-lateral Agreements (MLA) related to waste and chemicals management, Turkey signed and became a party to the Basel Convention on May 5, 1992 and June 22, 1996, and has actively exported wastes including POPs in accordance with the Basel Convention since that time. In that regard, it has also acceded to the UNECE European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). The Rotterdam Convention was signed in 1996 but has not been acceded to, although draft legislation adopting it and allowing accession has been a drafted and is being reviewed by Turkish Grand National Assembly for anticipated approval in 2014. The country has been active in the INC process leading up to the finalization of the Minamata Convention on Mercury and is proceeding toward its signing with a recommendation on this currently before the Government.

[2] http://www.thegef.org/gef/project_detail?projID=1873

[3] Now MoEU

[4] http://chm.pops.int/Implementation/NIPs/NIPSubmissions/tabid/253/Default.aspx

[5] "Draft Stockholm Convention on POPs – National Implementation Plan", Ministry of Environment and Urbanization, February 2014. The Draft NIP has not been approved officially there it may reflect the personal opinions of the experts who has been involved in the development phase.

[6] Turkey was not a Party during the first reporting round.

The priority POPS issues identified in the original NIP and addressed by the project are: i) elimination of POPs and other obsolete pesticide stockpiles, specifically lindane stockpiles, ii) completing the elimination of PCB stockpiles and undertaking a PCB phase out plan; iii) addressing U-POPs release reduction through implementation of BAT/BEP; iv) identification and clean-up of POPs contaminated sites, and v) strengthening national capacity to address POPs. The NIP itself is an integrated part of two broader public policy initiatives, namely expanding the implementation of sound chemicals management and the harmonization of national environmental policy, legislation and regulation with that of the EU. These are being reinforced in the current NIP update referenced above along with extension to cover the additional annexed POPs.

Implementation activities related to the current NIP action plan and its maintenance that have or are being undertaken, in addition to the currently presented programme on POPs legacy elimination and release reduction[7], include several other GEF supported projects as follows:

- GEF Project No. 4919: Enabling Activities to Review and Update the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs)[8] This project was executed by Ministry of Environment and Urbanization between 2012 – 2014.
- GEF Project No.5000: Life Cycle Management of Pesticides and Disposal of POPs Pesticides in Central Asia and Turkey[9]. This project is being executed by Ministry of Food, Agriculture and Livestock between 2014-2018.

A third GEF regional framework project (No. 2600) entitled "Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem – Regional Component: Implementation of agreed actions for the protection of the environmental resources of the Mediterranean Sea and its coastal areas" (known as the UNEP/MAP project) also has a linkage to POPs in the Turkey. This project that started in 2008 has a component directed to the disposal of PCBs, originally targeting several vulnerable low income countries in the region (i.e. Syria, Egypt, Albania, and Libya). Due to political and institutional issues, the GEF approved the substitution of Turkey, and Bosnia and Herzegovina in 2013, recognizing the termination of this project at the end of 2014.

In addition, there have been a number of bi-lateral international initiatives on or linking to POPs management in the country, mainly in relation development of expanded institutional, regulatory and technical support capability. These are predominately involve EU assistance where harmonization related to chemicals management, POPs and associated emission control and monitoring activities is a major focus of achieving compliance with the comply with EU environmental acquis. These bi-lateral assistance initiatives include:

- EU Special Waste Twining Project (Germany), 1.55 million EUR (2005-2007)
- EU IPPC Twinning Project (Spain-Poland-Turkey), Completed 2013
- "Technical Assistance for Implementation of the Persistent Organic Pollutants Regulation" EU IPA TR2010/0327.03, 1.0 million EUR, 2013-2015

[7] http://www.thegef.org/gef/project_detail?projID=4601

[8] http://www.thegef.org/gef/project_detail?projID=4919

[9] http://www.thegef.org/gef/project_detail?projID=5000

- "The REACH Chemicals Project", EU IPA Program TR0802.02, 2.5 million EUR, (2010-2014).
- "Implementation of Export and Import of Dangerous Chemicals Regulation", EU IPA ProgramTR2011/0327.21.07,1 million EUR (2014-2016)
- "Capacity Building on E-PRTR in Turkey", EU IPA Program 2.41 million EUR, (2014-2016)
- "Institution Building on Air Quality in The Marmara Region", EU Project TR 0702.07, 2010-2014 (7.08 million EUR)
- "IPPC-Integrated Pollution Prevention and Control" EU IPA Program TR0802.04, 2010-2014 (2.415 million EUR)
- "Improving Emissions Control", EU IPA Program TR0802.03, 2.05 million EUR, (2010-2014)
- "Control of Industrial Volatile Organic Compound Emissions", EU IPA program, TR2009/0327.01, 2.85 million EUR (2010-2014)
- "Better Air Quality By Transposing The Large Combustion Plant Directive" EU IPA Program TR2010/0327.04, 1 million EUR, (2014-2016)

Within the country, a major on-going commitment has been made to ambient environmental monitoring including a wide range of chemicals and specifically POPs which can form the basis for regulatory action and broader reporting such as provided for under the Stockholm Convention and Global POPs Monitoring Network. This includes a number of current and continuing projects by the Ministry of Forestry and Water Affaires (MoFWA) in partnership with the Turkish Scientific and Technological Research Institution (TÜBİTAK) and other organizations.

Three current specific projects as follows are highlighted:

- Control of Hazardous Substances Pollution 2011-2014 (2,165,000 TL) – Development of a sectorial hazardous pollutants release inventory applicable to water correlated with hazardous substance production and use, associated direct monitoring of water basin and point source discharge, and development of a web based Hazardous Materials Information System.
- Detection of Hazardous Substances in Coastal and Crossing Water and Ecological Coastal Dynamics 2012-2014 (:3,350,000 TL) – Monitoring program over a three year period (2012-2014) of hazardous substances including a wide range of chemicals and specifically POPs in urban and industrial wastewater release and general water quality in selected coastal areas along the Mediterranean, Aegean, Black and Marmara Seas This allowed the creation of an inventory of sectoral hazardous substances, the determination of the specific pollutants, and follow up studies in relation to environmental quality standards.
- Basin Monitoring and Reference Points Determination Project (10,850,000 TL) – Monitoring of 12 water basins (Kızılırmak, Küçük Menderes, Antalya, Marmara and Konya Closed Basin, Asi, Seyhan, Ceyhan, Western Mediterranean, Eastern Mediterranean, West Black Sea, Yeşilırmak) for 149 parameters including 18 POPs chemicals in surface waters. Additionally, the realization of monitoring of the remaining seven basins (North Aegean, Burdur, Aras, Coruh, Van Basin, Eastern Black Sea, and Tigris-Euphratesn) is planned between 2015 and 2016 years. Ultimately the programs will cover 25 basins are simultaneously.
- Determination of the water pollution arising from the use of the plant protection product and associated environmental quality standards 2012-2014 (Budget: 3,811,000 TL) –

Monitoring and program for pesticides in the basins of Euphrates-Tigris, Seyhan-Ceyhan and the Büyük Menderes and Amasya, Bursa and Manisa river systems and the determination of environmental quality standards. This includes inventory studies in order to determine the amount of plant protection products used in the past, particularly POPs pesticides, and currently used.

Another monitoring initiative with an international linkage is a study under the Global Passive Air Monitoring Network (MONET) project by Department of Environmental Engineering (Middle East Technical University) and Research Centre for Toxic Compounds in the Environment (Czech Republic) to identify atmospheric background levels of PCBs, PAHs and OCPs. This has been operating since 2010 with results anticipated to be published in 2014.

In general, Turkey is well advanced in addressing POPs management issues, particularly for water, notwithstanding its relatively late accession to the Convention. It is effectively current with its principle Convention obligations and has the policy and institutional framework in place to sustain this. Policies directed to harmonization with EU environmental standards and its substantial progress to the status of a developed industrialized country operating in global and particularly European markets have provided significant incentives in this positive progression. Consistent with the original NIP and what the current NIP update will indicate, the current priorities are to address several key residual POPs elimination and legacy issues (namely remaining PCB and POPs pesticide stockpiles and associated land contamination) as well as pursue prevention, capture and reduction of potential POPs releases from more diffuse sources such as PCB cross contaminated equipment and POPs contaminated soils as well as U-POPs and management of new POPs.

Situation respecting POPs pesticides and other obsolete pesticides

Turkey like most similar countries has history of synthetic organo-chorinated pesticide (OCP) use generally dating from the 1940s including significant use of POPs pesticides particularly DDT but also including aldrin, heptachlor and lindane among others. As would be anticipated, this has led to a finding of the presence of a variety of POPs pesticides in the general environment. The results of monitoring of POPs pesticides work since in the 1980's has been comprehensively reviewed in Section 2.3.6 of the draft NIP update with the results showing the presence of most major POPs pesticides in a number of major rivers, large inland water bodies in Central Anatolia and Black and Aegean Sea coastal waters. Soil studies in the Göksu Delta show a continuing presence of DDT and HCH. Ongoing water monitoring programs such as those referenced above include a wide range of OCPs including POPs pesticides.

As reported in the original NIP and subsequently in the current draft updated NIP, the country's situation is generally well advanced with respect to addressing POPs pesticides and obsolete pesticide stockpiles in general. All the annexed POPs pesticides were licensed and most used to at least some extent in Turkey with the exception of Micrex. Lindane and DDT were manufactured in the country until 1983 by a predecessor company of Koruma Tarim A.S. in the Sirintepe district of Kocaeli. However, application, production and import of all the original and currently annexed POPs pesticides were banned in the 1970s and 1980s except Endosulfan which was banned in 2009. Lindane, other HCH isomers and DDT were restricted in 1978 and banned in 1985. All significant stockpiles except as noted below have been eliminated including a small stockpile of old DDT (approximately 11 t) that was reported held by the then Ministry of Agriculture and Rural Affairs but disposed of in 2008 as part of the NIP implementation program. In general obsolete pesticides and POPs pesticides in particular in

the form of stockpiles are considered hazardous waste (HW) under relevant Turkish regulations.

With respect to general non-POPs obsolete pesticide stockpiles, consultation with the responsible officials in the Ministry of Food, Agriculture and Livestock (MoFAL) indicate that there are not significant historic stockpiles in the country except for is a widely distributed inventory of approximately 30 t of expired pesticides collected from small distributors and users. This is apparently under MoFAL control and has been accumulated by the local branches of the ministry as a public service program for these small generators.

As it is indicated in the NIP prepared in 2011, the only remaining designated POPs pesticide stockpile that has been identified exists in the country is one held by a private chemical distributor (Merkim Endüstri Urünleri A.S) at a storage warehouse in the Derince District of Kocaeli in Izmit province adjacent to the Marmara Sea south west of Istanbul. The stockpile has been generally reported to consist primarily of y-HCH and other HCH congeners but with possibility of some DDT residues. Some uncertainty exists as to the origin of this material. The 2010 NIP indicates that this material was commercial lindane imported by Agricultural Protection Chemicals Co. for agricultural purposes in early 1980s. Other reports suggest that this material was accumulated during the production of DDT and Lindane at nearby production facility during 1983-85 when both these POPs pesticides were banned in Turkey. The production facility subsequently changed hands and under this ownership went into bankruptcy in 1994. The assets were sold with the warehouse site, structure and contents ending up in the hands of Merkim, the current owner.

The Merkim site is located in a water front industrial area on the north side of a long bay on the eastern end of the Marmara Sea approximately 500 m from the waterfront. The general location and configuration in two views is illustrated in Figure 1. The site covering an area of 2,500 m^2 is oval shaped, fenced and surrounded by local public roads serving the surrounding industrial installations. The area immediately to the west, east and south (extending to the waterfront) is occupied by industrial facilities primarily petroleum and chemical storage and handling facilities. Immediately to the north is a main highway and further industrial development. The nearest residential/commercial development is approximately 1,000 m to the northeast. A small recently constructed mosque is located about 100 m immediate to the west of the site opposite the Merkim site's a main access gate apparently to service the employees of the neighbouring industrial complex.

The overall warehouse facility consists of six interconnected buildings (designated Warehouse #1 thru 6) having corrugated steel and masonry block walls, concrete slap floors and a corrugated roof. There are four interconnected rectangular 20 m by 25 m warehouse structures (Warehouse #3-#6) with two smaller annex buildings (Warehouse #1 and 2) on the north end. Each of warehouse structures is 500 m^2 and the two connected annex buildings are 408 m^2 and 135 m^2 respectively for a surveyed surface area of 2,543 m^2. When first visited during the development of the PIF, the site facility while nominally secure with adequate fencing and a locked gate and main entrance door but was otherwise in generally poor condition with breaches in walls and roof, evidence of water accumulation inside at low points particularly in the building interconnecting areas. Warehouse # 1, 2 and 3 contained a variety standard metal and HDPE barrels (220 and 120 l respectively) some containing powder pesticides and others empty, along with bagged pesticides presumed to be the original packaging (50 kg) on pallets or piled randomly. Warehouse #2 also contained packaging equipment apparently used to transfer bagged material to barrels. Warehouse #4 through #6 contained bagged pesticides

randomly stacked, many of which were broken and spilling contents. Figure 2 provides a selection of illustrative pictures of the warehouse and its interior at that time.

An independent survey report[10] from 2005 provided a detailed breakdown for each designated warehouse building (Warehouse #1 to #6) with respect to the area occupied and estimated volume of material stored in barrels, bags and their status as to being on pallets or otherwise. The total estimate of the volume of pesticides is 2,967 t (+/- 10%) which appears to exclude additional volumes that would be associated with cleaning up residuals and waste packaging. A more recent survey undertaken by the same surveyor in December 2011 indicated that the volume remaining in the warehouse was 2,340 t with waste materials and occupied 1,260 m^2 of a total floor area of 1,635 m^2. The difference in volumes reflects disposal activities undertaken by Merkim on its own initiative where material was packaged and exported for high temperature incineration in Germany from 2007 through 2010. Merkim records show that 313 t were disposed of through 2010. Since that time an additional 238 t of material has likewise been packaged and exported, again to licenced German facilities. As a consequence of raising the issue during PIF preparation and the prospect of GEF financing, Merkim have also undertaken substantial facility renovations including the following i) replace side wall panels/masonry and seal with foam ii) repair major roofing deficiencies; iii) seal secondary doors around the facility with concrete barriers and reinforce the main gate and access door: iv) clear and package rubble and waste material to establish a secure internal working area; and upgrade signage. The facility is now considered reasonably air tight and water proof to mitigate any potential external contaminant transfer which likely occurred historically (see below).

With respect to analytical verification of the materials in the warehouse the enterprise has generally identified it as all lindane although Basel Convention notification documents for previous disposal shipments identify the material as HCB/Lindane and HCB. During the PPG, a general sampling program was undertaken by TUBITAK[11] that confirmed the material in the warehouse (at least that which was readily accessible) was 33 to 40% HCH (the remainder being inorganic material) in four congeners with alpha-HCH being predominate (26 to 39% total weight and y-HCH (lindane only being 4 to 13%). Sampling was also done on residues on floors and internal walls. This showed significant total OCP contamination in the form of HCH but also 4.4-DDT, 4.4-DDE and 4.4.-DDD. The total OCP from these substances ranged from just above the low POPs content level of 50 ppm to over 17,000 ppm. These results confirms that the stockpiled material is a high concentration POPs waste but also that it was more likely a process by-product potentially associated with OCP production rather than a commercial expired or obsolete pesticide in the form of a final product. It also shows that there is a significant amount of residuals contamination associated with the structure that is also POPs waste. The one anomaly noted is the presence of DDD, DDE and DDT as well that may suggest the presence of these substances historically.

Additionally during the PPG stage as part of same TUBITAK study referenced above, a preliminary soil sampling program around the site was undertaken. These results based on composite samples covering the top 25 cm of soil indicated that there was detectable contamination of total OCP in a range from less than 1 ppm to as high as 2,700 ppm. This consisted of the same four congeners of HCH in roughly the same proportion found in the stockpile but also noted the presence of DDT, DDE and DDD often in higher concentrations

[10] Inspection Report No: GL-1212/05, Link Inspection Expertise Services Co. Ltd, November 21, 2005

[11] "Chlorine Pesticide Analysis Studies in the Samples (Raw Material, Soil, Wall and Water) of Merkim Endüstri Urünleri a.ş., TUBITAK Marmara Research Centre, December 2013.

than the HCH congeners. The sampling points that were distributed around the warehouse showed that most areas the contamination levels were relatively low (0.3 to 22 ppm), albeit potentially requiring action depending on the future land use of the site. However, a number of "hot spots" with relative high levels of soil contamination (up to 2,700 ppm) were identified generally correlating with access building points and locations were the integrity of the structure had deteriorated before the 2011 renovations to secure the structure. This suggests that there has been historic contamination from operational activities over the years and likely airborne distribution from breaches in the structure itself due to air flow effects. The other observation made from examining this data was the high and in some cases dominance of DDT, DDE and DDE relative to HCH congeners in this contamination. This in combination with the observations on inside residues suggests the possibility that a wider variety of POPs pesticide related chemical waste may be or have been historically stored in the facility.

The Merkim site is well known in the Kocaeli area having been the subject of extensive press, local government, NGO, and national regulatory attention since at least 2000. Within the immediate industrial area the neighbouring enterprises and their staff are understood to be well informed of the purpose and contents of the Merkim warehouse which is also signified by appropriate signage. The continuing existence of the legacy involved has made addressing it a major public priority nationally, for the region and locally.

Figure 1: Location of the Merkim Site

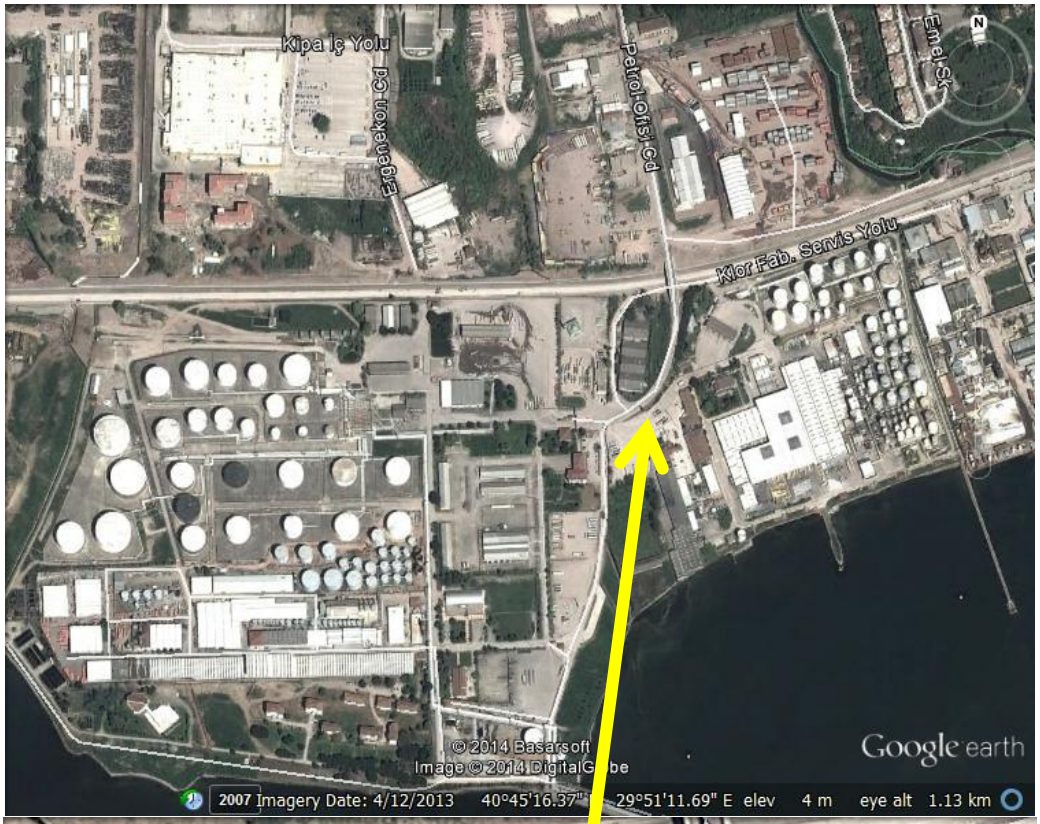


Figure 2: Merkim Site Conditions



YENİLMEZ
İÇİLMEZ





Situation respecting PCBs

As documented in the NIP, there has been extensive study of PCBs in the environment (air, water, soil and sediment) and in human receptors. PCBs have been detected in a wide range of biological media including breast milk, human tissue, mussels, and other marine life. This suggests that PCB release represents a continuing issue and supports addressing remaining concentration sources. This has been the subject of a recent comprehensive review[12].

PCBs were never produced in Turkey but like most countries was extensively used in the whole spectrum of common applications, dominated by use as a dielectric material in electrical equipment, primarily transformers and capacitors that were both imported and produced in the country. The new use of PCB based equipment occurred up to 1993 at which time it stopped in part because of the almost universal international phase out of production and manufacturing use, and administrative measures taken in Turkey to prevent import. No detailed records exist in relation to the amounts of PCBs or PCB based equipment that was imported into the country prior to 1993.

Regulatory attention to the control and elimination of PCBs started in the early 2000s culminating in current regulatory framework[13] enacted in 2007 and now administered under the authority of MoEU. This regulation establishes obligations for the PCB holders and the institutions. MoEU has the obligation to: i) create and maintain the PCB inventory; ii) prepare the national PCB management plan; and iii) issue licenses for PCB disposal / decontamination. The Provincial Directorates of MoEU are empowered to: i) identify holders of used PCBs, materials and equipment containing PCBs; and ii) enforce requirements imposed on PCB holders related to PCB Inventory form notifications, and equipment labelling. These regional authorities also enforce the operational HW regulatory functions applicable to PCBs (issuing licenses for transportation, storage facilities, and treatment and disposal facilities). Industries that are PCBs holders have the obligation to: i) perform sampling and analysis of their equipment to detect possible contamination exceeding 50 ppm; ii) label and register PCBs and PCB containing equipment; iii) implement labeling / signage of areas containing PCBs; and iv) provide notification of PCB storage locations and facilities.

Prior to 2007, no systematic inventories of PCBs or PCB equipment had been done and estimates of the amount and distribution of PCB based equipment, either as stockpiled waste or in-service equipment were absent except for some theoretical estimates that were extrapolations of German experience done under an EU program. Under the above regulations, provisions are in place for registration and reporting of such information but at the time of the PIF preparation progress in its implementation was limited. However, more recently, MoEU has established an on-line database accessible to register holders of equipment were equipment that are possibly contaminated by PCBs. This listing provides for entering information related to their equipment, including the

[12] Kadir Gedik, IpekI˙mamogˇ lu, "An Assessment of the Spatial Distribution of Polychlorinated Biphenyl Contamination in Turkey", Clean 2010, 38 (2), 117 – 128.
[13] Regulation on Control of Equipment containing PCB-PCT, No. 26739, December 12, 2007

concentration of PCBs. However, the database is still in an early stage of development and no information related to PCB contaminated equipment may be found on it.

A preliminary PCB equipment inventory of stockpiled out of service equipment and oils, and PCB containing equipment remaining in service was developed in the 2010 NIP, primarily with respect to that found in the national electrical utilities and major private sector enterprises. In general it is apparent that substantial amounts of PCB based electrical equipment were at one time used but since 2001, much of this has been retired and disposed of. The estimates provided indicated that 19,000 t of PCBs (equipment and oil) had been disposed of primarily by export to Western Europe (15,000 t), and 4,000 t handled by domestic hazardous waste management facility. With respect to remaining equipment, the 2010 inventory primarily addressed inventories from the three main utilities indicated that there were 2,145 capacitors in-service, off line or held as replacements and only 6 PCB transformers remained in service and 6 were stockpiled awaiting disposal. Since 2003 EUAS (Turkish Electricity Production Company) has disposed of 196 PCB transformers.

According to the inventory prepared by MoEU (Regulation on Control of Equipment containing PCB-PCT (Official Gazette, 12 Dec.2007, No: 26739) a total of 1,080 tons of pure PCB containing materials and equipment was recorded. This involved 177 PCB based transformers (912 t), and 2,782 PCB based capacitors (138 t). It also recorded 30 pieces of PCB cross contaminated equipment with a weight of 30 t that is assumed to be cross contaminated mineral oil equipment. Separately this document reports that PCB containing waste is also inventoried in MoEU's Environmental Information System (EIS). In 2009, the amount of PCB containing equipment or waste registered in the system was approximately 129 tons. While waste oils containing PCBs were reported to constitute 81% of this amount, 19% resulted from PCB transformers or capacitors. There was an increase in the amount of transformers or capacitors containing PCBs in 2010, namely, 89% of 555 tons. In 2011, 450 tons of PCBs were registered and 52% of this amount was PCB containing waste oil and 48% was from PCB transformers or capacitors.

In a joint effort undertaken with PPG resources and UNIDO/UNDP guidance with the UNEP/MAP project a direct survey using site visits and a screening sampling program was undertaken in 2013-14. This provides the most current validated inventory of PCBs and PCB containing equipment available and a reasonable reference for the current project. Table 3 provides the current verified inventory of PCBs and PCB containing equipment stockpiles. This indicates a total disposal weight of 490 t exists including 93 PCB based transformers and 684 capacitors accounting for 454 t, 7 transformers that would likely be considered cross contaminated mineral oil transformers (22 t) and 14 t of PCB or PCB contaminated oil. It is understood that the UNEP/MAP project and MoEU have committed to the collection consolidation and destruction through export of up to 500 t of this currently stockpiled PCBs and equipment by the end of 2014 Table 4 provides the parallel inventory of currently identified in-service PCB based equipment. This consists of 95 transformers and 2,118 capacitors with an overall disposal weight of 674 t which will have to be phased out, and either retired and destroyed or otherwise treated to eliminate PCBs. It is understood that the majority of this is pure PCB equipment likely approaching the end of its service life hence the likely disposition is environmentally sound destruction. .

Additional work has been done in relation to the broader issue of cross contamination and opportunities for on-line decontamination of transformers in the course of the PPG and joint work with the UNEP/MAP project. Relevant baseline information available is summarized as follows:

- The total number of distribution transformers in Turkey is estimated to be 335,000.
- PCBs transformers /capacitors and non-PCB equipment are reported to be or have been maintained at common sites and maintenance facilities which suggests a potential source of general cross contamination.
- UNEP/MAP survey data involving screening analysis has identified 25 mineral oil transformers out of 249 sampled accounting with cross contaminated mineral oil over 50 ppm.

Historically, it has been demonstrated in a number of countries that low-contaminated (i.e. PCB concentration ranging from 50 ppm to several thousand ppm) generally exist along with PCB based electrical equipment. In North America, the data concerning the PCB inventory[14] show that near 10% mineral oil transformers are contaminated by PCB with a concentration greater than 50 ppm, and that near 1% of the mineral oil transformers are contaminated with a PCB concentration greater than 500 ppm. The overall number of transformers so contaminated in the United States has been estimated in the order of 28 million with a ratio of transformers to electricity production being in the order of 7000 transformers for each TWh produced. In Italy, the overall number of PCB contaminated transformers was approximately 100,000 pieces, i.e. nearly 14% of the overall number of transformers were found to be PCB contaminated. In the same period the national PCB inventory in France at that time listed 546,610 PCB containing equipment (July 2002). This number is considered not exhaustive, and further collection of data has been performed after that date. The overall mass of PCB contaminated equipment (with a PCB concentration > 0.05%) was estimated as 33,462 t.

Although the actual numbers are not enough for any statistical inference applicable to the situation in Turkey as yet, it is evident that the problem of cross contaminated PCB does exist. Based on the latter, it is reasonable to assume that the number of cross contaminated transformers may range from 5% to 15% of the overall transformers inventory in the country currently estimated to be 335,000. As a consequence this problem will have to be adddressed in the near future to comply with the Stockholm Convention requirements and with the national regulation on PCBs. Additional work continues with specific enterprises to broaden and increase the accuracy of this information base on cross contamination and develop viable business solutions to accomplish this. It is taking a primary but not exclusive focus on electrical utilities and particularly distribution utilities where a large number of potentially cross contaminated transformers may exist based on general global experience. On this basis the following provides a brief overview of the structure and nature of electrical utilities in Turkey

The Turkish Electricity Authority (TEK), a state-owned vertically integrated company that controlled generation, transmission, and distribution of electricity in Turkey prior to economy-

[14] CEC. 1996. Status of PCB management in North America. Commission for Environmental Cooperation, Montreal, Canada, and RPC. 1988. Estimated 1988 PCB equipment inventory, Appendix A. Resource Planning Corporation. October., 1996

wide reforms in the 1980s. The government passed the first law to set up private participation in 1984 and began unbundling the Turkish public electricity sector in 1993.

In 2001, the government enacted the Electricity Market Law to set up a comprehensive electricity reform program. Under the law, the state-owned Turkish Electricity Generation and Transmission Corporation (TEAS) was split into separate generation, transmission, distribution, and trade companies, with a goal of eventual privatization of the generation and trade companies. Turkey has taken steps to create competitive wholesale trading and retail sales markets and plans to open the market for all customers by 2015. In addition, retail tariffs were changed to reflect the cost of generation, transmission, and distribution without subsidies.

The 2001 law also created the Energy Markets Regulatory Authority (EMRA) as the regulator of the electricity market. It is tasked with issuing licenses for all market activities related to the electricity market, determining and approving regulated tariffs, and setting the eligibility limit for market opening. In addition, it is involved in drafting legislation affecting electricity markets, resolving disputes, and applying penalties. In March 2013, the Turkish government passed a new Electricity Market Law, establishing an independent regulatory and auditing mechanism for the electricity market.

The largest generation company is the state-owned Electricity Generation Company (EUAS), which controls about half of all generation in Turkey. The remainder of generation comes from independent power producers and firms given special state concessions to build and operate power plants. Turkish Electricity Transmission Company (TEIAS) is the publicly owned enterprise that owns and operates the transmission system and is legally unbundled.

The electricity distribution system in Turkey is owned by TEDAS (except Kayseri), a corporation created from the restructuring of TEK, an integrated electricity utility, in 1993, and operated by 20 regional distribution companies under transfer of operating rights (TOOR) contracts. TEDAS was shifted to the "privatization program" of the Privatization Administration (PA) in April 2004 and was restructured into 20 regional companies in 2005. In addition to TEDAS, eligible consumers are supplied by IPPs, auto-producers, wholesalers and other private producers. One region, Kayseri, is operated by a separate company in which the municipality holds the largest stake. TEDAS sales made up about 75% of total consumption of electricity in Turkey in 2005, with the remaining attributable largely to auto-producers eligible consumers. TEDAS sold about 93 TWh in 2005 to about 28 million consumers. About 30% of total consumption was by industrial consumers in 2005, with residential consumers making up another 30%.

In the last decade, significant investment has been made to reverse the declining condition and system reliability of the electric distribution sector. In 2005, in many regional distribution companies, the urban distribution network was still posing a safety risk. Turkish towns and cities have urbanized rapidly, and in several places, urban housing and commercial developments have expanded with little regard for environmental or safety considerations vis-a-vis existing

distribution networks. In 2007, a World Bank project [15] aimed at supporting the rehabilitation of the Turkish electric network was launched.

[15]World Bank. Proposed loan in the amount of euro 205 million (US$269.4 million equivalent) to the Turkiye Elektrik Dagitim A.S. (TEDAS) with the guarantee of the Republic of Turkey for an electricity distribution rehabilitation project March 26, 2007

Table 3: Inventory of Stockpiled PCBs and PCB Containing Equipment

Category/Use	Number of Equipment	Weight of Equipment (Tons)
Transformer	93	418
Capacitor	684	36
Contaminated Equipment	7	36
Total	**784**	**490**

Table 4: Inventory of Identified PCB Based Equipment in Service

Equipment Type	Total Number	Total Weight (kg)
Transformer	**95**	**515,194**
Capacitor	**2118**	**105,900**
Total	**2213**	**621,094**

Situation respecting U-POPs release

The primary legal and regulatory related to U-POPs in Turkey is provided for under the current version of the Regulation on Control of Industrial Air Pollution (Official Journal No: 27277, Date: 03.07.2009). Under the 2004 version of regulation, PCDD/F air emissions were classed as "very dangerous substances" and through the course of several amendments, sets an emission limit value of 0.1 ng/Nm^3 for PCDD/F emissions and requires all relevant measures to be taken in order to meet this limit value. Additionally it applies the same limit individually to other annexed POPs and similar chemical releases, namely PCBs, polybromated dibenzodioxins, polybromated dibenzofurans, polyhalogenated dibenzodioxins and polyhalogenated dibenzofurans.

The first U-POPs inventory for PCDD/F developed in the NIP (covering the 2004-2006 period) was carried out applying the UNEP Chemical Standard Tool Kit. The 2006 inventory was updated with new data in 2010. The total annual release was estimated as 2,005 g TEQ (emission into air, water and soil) of which the greatest part was released in the atmosphere.

According to that inventory, the largest sector for air release was the ferrous and non-ferrous metal production (624.7 g TEQ/year) with over half coming from copper production and a quarter from iron and steel production. Other significant major contributors were the production of mineral products, primarily cement kilns (245.6 g TEQ/year), power generation or heating (143.3 g TEQ/year), uncontrolled combustion process (151 g TEQ/year), waste incineration (62.8 g TEQ/year) and transport (21.5 g TEQ/year). Main releases via solids originate from the metal industry mainly in ashes (675.4 g TEQ/year).

No inventory data was available for unintended release of other POPs in the 2006 and 2010 work although PCBs and HCH emissions are identified for future investigation. In particular elevated levels of PCB in ambient air in areas where waste oil was used as a heating fuel in intensive greenhouse operations has been identified for further investigation, something noted for investigation in the PIF.

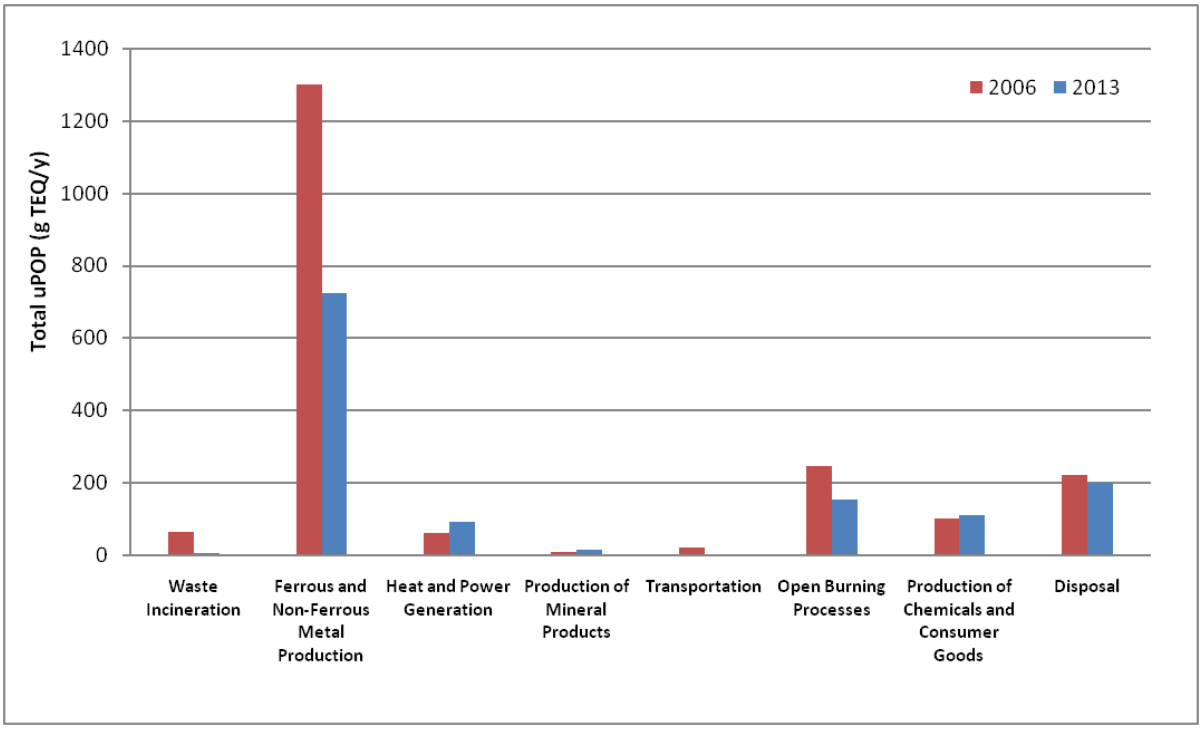
An updated inventory study using the latest version of the Tool Kit and attempting to account for other POPs has now been completed within UNIDO NIP Update Project (2014) based on input data from an industrial survey conducted in 2013. Table 5 summarizes the results of this project for each source category compared to the NIP. This shows that, the total PCDD/F emissions have reduced significantly. Emissions to air which had the highest portion in 2010 survey results has also reduced significantly from 929 g TEQ/a to 309.1 g TEQ/a. In the updated survey results, residues have the highest PCDD/F annual release, ferrous and non-ferrous metal industry being the majority of it. The ferrous and non-ferrous metal industry is responsible for the majority of the emissions to air comprising 50% of the total emissions to air and approximately 12% of the estimated total PCDD/F emissions.

Table 5: 2010 (revised) and 2013 U-POPs Inventory Results for Turkey

Category	Source Category	Annual Releases in 2010 (g TEQ/a)					Annual Releases in 2013 (g TEQ/a)				
		Air	Water	Land	Product	Residues	Air	Water	Land	Product	Residues
1	Waste Incineration	62.8	0.0	0.0	0.0	1.3	0.0	NA	NA	NA	2.8
2	Ferrous and Non-ferrous Metal Production	624.7	0.0	0.0	0.0	675.4	156.2	0.1	NA	NA	567.4
3	Power Generation and Heating/Cooking	59	0.0	0.0	0.0	13	60.5	ND	NA	NA	31.2
4	Production of Mineral Products	10	0.0	0.0	0.3	0.1	11.2	NA	NA	0.2	2.7
5	Transportation	21.5	0.0	0.0	0.0	0.0	2.6	NA	NA	NA	NA
6	Uncontrolled Combustion Process	151	0.0	96	0.0	0.0	78.4	ND	76.8	NA	NA
7	Production of Chemicals, Consumer Goods	0.0	5.3	0.0	72.5	23.3	0.3	7.5	ND	87.4	15.3
8	Miscellaneous	0.0	0.0	0.0	0.0	0.1	NA	NA	NA	NA	0.1
9	Disposal/Landfilling	0.0	6.5	0.0	2.2	180	NA	6.1	NA	1.6	193.2
10	Identification of Hot Spots	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	13.7	NA
Total		**929**	**11.8**	**96**	**75**	**893.2**	**309.1**	**13.7**	**76.8**	**102.9**	**812.7**
Sum Total		**2005**					**1315**				

Comparison of two inventories shows that there is an estimated decrease of 36% in total U-POPs emissions from 2010 to 2013. The change in U-POPs releases with respect to source categories is given in Figure 3.

Figure 3: Change in U-POPs releases with respect to source categories



Since the year 2000, studies related to the EU-IPPC Directive have been carried out in Turkey with the intention of building an institutional capacity and through these initiating initiatives for U-POPs reduction measures. Institutionally, this has included the formation of an IPPC Branch within the Air Pollution Control Unit of MoEU who has carried out pilot studies in selected industrial sectors in addition to those carried out with direct EU assistance. The following summarizes some of this activity:

- BREFs have been made available in Turkish for selected industrial sectors since 2004 (textiles, cement, iron and steel, large combustion plants).
- A draft Regulation on Integrated Permitting (covering Chapter I and Chapter II of the EU's Industrial Emissions Directive (2010/75/EU) was a product of the EU IPPC Twinning Project (Spain-Poland-Turkey)
- MoEU is targeting shifting to the integrated permitting system by year 2015 and to the full implementation of the IPPC Directive by 2018.
- The Integrated Environmental Approximation Strategy (UÇES) (2007-2023) estimated 13 billion EUR investment need for IPPC compliance (out of 59 billion EUR estimated for the whole environment related investments)
- The EU Technical Assistance Project on IPPC (finalized in 2014) estimated 20-40 billion EUR investment need for all operators under IPPC.
- National sectorial BAT guidelines for selected sectors (Textile Industry, Electric Arc Furnace I&S Installations, Refineries, Large Combustion Plants (coal and lignite burning) and a guidance document on integrated permitting for both the operators and the MoEU experts were also products of the EU IPPC Twinning Project (Spain-Poland-Turkey).

Sector Analysis – Iron and Steel

The Iron and Steel industry in Turkey consists of 30 steelmaking facilities concentrated in 4 regions as illustrated in Figure 4. Total capacity is 50 million t/year. By process, three are fully integrated plants with basic oxygen furnace (BOF) technology, 24 are electric arc furnace (EAF) steelmaking plants, and 3 facilities are based on induction furnace technology. The crude steel production was 35.8 million t/year in 2012, up from 20.9 million t/year in 2005, making the country the 8th largest global producer. Projections suggest production could reach 70 million t/year by 2023.

Overall the sector is considered both efficient and having a high level of environmental performance relative to global indicators as a result of having undergone major modernization and new investment, particularly through utilization of EAF technology which accounts for 75-80% of production capacity. In terms of carbon foot print, the average CO_2 emission for producing 1 ton of crude steel in Turkey is 0.62 tons. This compares favourably with the global average of 1.7 tons, and with China's average of 3.1 tons.

While the low carbon foot print is attributable to the bias to EAF technology, this also has implications in relation to U-POPs emissions, particularly PCDD/F. Ferrous scrap exports from

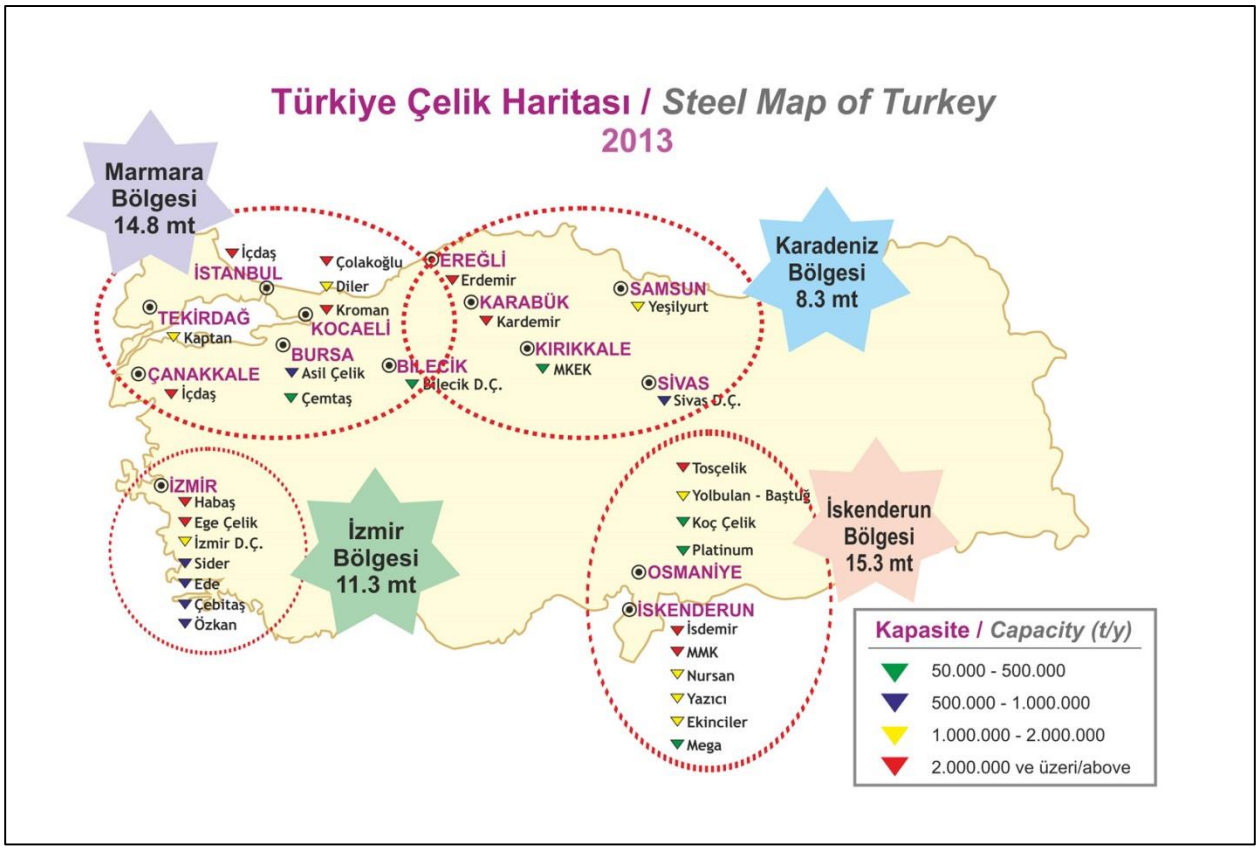
the EU to third countries reached a record high in 2012[16]. The 27 member states exported around 19.22 million tonnes of iron and steel wastes and scrap of which 11.05 million tonnes at a value of €3.3bn and around 58% of all extra-EU ferrous scrap exports went to Turkey. EAF plants are a significant source of PCDD/F emissions which increase with scrap volume and are also a function of scrap quality and segregation practice. This represents a U-POPs reduction opportunity through BAT/BEP emission controls and adoption of regulatory policies related to scrap quality such as in the EU Regulation No 333/2011 which establishes criteria determining when certain types of scrap metal cease to be waste under the Waste Directive.

The sector is one of the strategic sectors which is subject to compliance with key applicable EU Environmental Acquis Directives – Industrial Emissions Directive (2010/75/EU) being one of the most important ones and in order to be competitive with EU producers has prioritized environmental investment and associated R&D with a particular focus on enhancing productivity and resource efficiency. More than $1bn of investment was made in environmental technologies between 2002 and 2007 with an additional $1.5bn being projected by 2015.

Figure 4: Steelmaking facilities in Turkey[17]

[16] World Steel Association, "Steel Scrap: a world-traded commodity", 18/06/2013 (http://www.worldsteel.org/media-centre/Steel-news/Steel-scrap--A-world-traded-commodity.html)

[17] Turkish Steel Producers Association, http://www.tcud.org/tr/page.asp?id=12)



Non Ferrous Metallurgy Sector

Production of ferrous and non-ferrous metals is the largest source of PCDD/F release in Turkey as confirmed in the latest updated version of the U-POPs inventory. Based on the revised draft NIP (2014), the following characterizes this sector:

- Copper production is very common in Turkey. According to the SPO 9th Development Plan Specialized Expert Committee Report in 2005, 35,000 t of primary and 627,700 t of secondary copper was produced in Turkey. A significant portion of blister copper production in Turkey is realized through the flash melting method, which is a new technology.
- Copper production using scrap copper is accomplished by different plants located in Istanbul, Izmir, Ankara, Balıkesir, Eskisehir and Mersin. The annual production is estimated to be around 50,000 t. Due to lack of information, all the plants in this sector are considered to have only the basic technology for emission factors.
- Aluminium is mainly produced as a primary aluminium at a plant in Konya. Aluminium production from waste aluminium scrap is mainly accomplished by bigger plants located in Istanbul, Izmir, Ankara and Mersin. Some of these firms have good process control technologies and some of them have only simple dust removal systems. Approximately 40,000 tons of aluminium scrap is provided from external resources. Imports are mainly made from Russia, CIS and North European countries.

- In the cast aluminium sector, especially as a result of development of the domestic motor vehicles industry and increases in the cast aluminium exports, a significant progress is anticipated. As of 2005, a total of 250 enterprises (ranging from small to large scale) have realized a total annual production of 35,000 tons.
- Lead and zinc are mainly produced by small and medium enterprises in Turkey. The total lead production in Turkey is about 500,000 tons and 69,000 tons for zinc in 2002 and there is only one plant in Ankara which produces lead from waste lead. There are 15 zinc recovery plants in Turkey which produce zinc from waste materials.
- Magnesium production is very limited in Turkey, there are 3 registered magnesium producers in Turkey that are located in Istanbul, Tekirdağ and Balıkesir but no production information are available.
- There is yet no nickel production in Turkey except for a pilot establishment.

Situation respecting contaminated sites

Turkey like all rapidly industrializing countries has developed a legacy of contaminated sites, including sites associated with general chemicals and POPs contamination. Up until recently attention paid to such legacies has been limited and no systematic inventories or prioritization, or actual process for addressing them has existed. However, there has been increasing attention paid to the issue since 2000 largely at a local level by individual enterprises and local authorities. The initial efforts reported above in relation to the Merkim site are an example. Similarly there has also been an increasing body of largely academic work on the subject as well as investigations by international NGOs.

This situation started to change at the institutional level over the same period and culminated formally in 2010 with the introduction of a formal national regulatory framework in the form of the Soil Pollution Control and Point-Source-Contaminated Sites Regulation[18]. This regulation has been developed using international precedents, particularly from the EU and North America. It establishes a mandatory system of identifying and registering contaminated sites in a broad range of industrial and public utility sectors, a process for its staged evaluation and initiation of corrective action. The comprehensive regulation itself is supported by an extensive guidance manual detailing detailed procedures and formats as well as various technical responses for specific contaminate situations.

In general terms the process set out in the regulation is based on a number of steps, starting with the mandatory filing of an assessment statement of industrial properties of all major sites, categorized by sectors. Based on this, sites are categorized as not subject to further attention or not, with the latter then being subject to staged site assessment including risk assessment that would ultimately determine clean up and future allowable land use. Functionally this process feeds three main component information management systems that for the basis for inventory and control mechanisms, namely the: Contaminated Sites Identification and Registration System (CSIRS), Contaminated Sites Evaluation System (CSES), and Contaminated Sites Clean-Up

[18] "Soil Pollution Control and Point-Source-Contaminated Sites Regulation", No. 27605, June 8, 2010.

System (CSCS). Administratively, the process is directed from the national level in MoEU in terms of policy and process guidance but operationally its implementation will devolve to the regional level. More specifically it will involve the establishment of a Polluted Area Assessment and Monitoring Committee as a permanent structure within governorate in every province for the purpose of certifying Field Sampling and Analysis Plans, evaluating Preliminary and Final Field Status and Risk Assessment Reports, and monitoring studies for cleaning of polluted areas. Committee is to be presided over by the Provincial Manager and constituted by the representatives of Provincial Directorate of Agriculture, Provincial Directorate of Health, Provincial Directorate of Industry and Trade, District Directorate of State Hydraulic Works, Special Provincial Administration, and university and other institutes and organizations thought appropriate by the Committee.

One feature of the regulation and its application is adoption of a formal system whereby who is allowed to undertake site assessment and actual clean up design and work is to be controlled and limited to firms and organizations specifically approved and authorized by MoEU. This covers the various formal steps, activities and reporting required under the regulations including such things as the Field Sampling and Analysis Plan, Field Status and Risk Assessment Preliminary and Final Reports, Cleanup Activity Planning and Assessment Report, and Cleanup Activity Implementing, Monitoring, and Finalizing Report. The regulations provides for a qualification criteria and establishment of principles and procedures covering the issuing Qualification Certificate, controlling authorized institutions and organizations, and renewing or terminating the certificate. At the present time, MoEU have issued certificates to nine nationally based firms and currently have an additional two under consideration.

While the regulations have been in place since 2010, formal implementation is not planned until mid-2015. The intervening period is being used to strengthen the administrative and technical capacities of the related institutions specifically within MoEU and the regional authorities who have implementation responsbility for it as well as further develop the various detailed procedures required for such implementation. MoEU plans to initiate the roll out of the regulations in 2014 and through the period 2015 -2018 the framework will tested, fine tuned and largely be implemented as a priority national policy initiative.

Notwithstanding the significant progress and positive direction now apparent in addressing contaminated sites from a regulatory perspective, development of a comprehensive knowledge and action on the issue is uneven. Table 6 summarizes information, largely collected in the course of the PPG activity of the current project, on chemicals and/or POPs contamination. However, at this point there is no formal or even formal regulatory data that would form an inventory of these. What physical clean-up work that is being done in the country is generally unregulated as yet, largely being undertaken voluntarily by individual owners (often international companies applying home country due diligence based environmental policies), and otherwise generally limited to relatively superficial clean-up activities to allow sale and/or continuing industrial use.

Table 6: Identified Potential POPs/Chemicals Contaminations

Contamination Type	Background/Description/Status
OCP (HCH)	• Storage facility containing up to 3000 t of OCP stockpiles, mainly HCH by-product from pesticide production slated for removal and destruction as POPs stockpiles. • Buildings also to be cleaned and demolished in preparation for future site industrial. Moderate surficial OCP soil contamination found on the site around the buildings. • All of the above along with surface soil removal to be undertaken under Component 1 of the current project.
PCBs	• Located adjacent to a marsh declared environmental protection area. • Facility operated as a main electrical equipment repair/maintenance operation from 1978-1995. • Extensive evidence of PCB contamination in adjacent water, sediments including hot spots>50 ppm. Limited on site soil contamination data available (464 PPM)[19]. • No verification on-site assessment has been undertaken and to date the owner has declined to consider further assessment or action until the regulations are implemented and/or a possible disposition of the site to another party.
PCBs	• Possible general and PCB contamination currently being investigated • Likely largely associated with maintenance of mineral oil equipment but may reflect historical use of PCB equipment and cross contamination. • No verification on-site assessment has been undertaken and to date the owner has not made a decision on further action pending implementation of the new regulations.
Tri/tetrachlorinated ethenes/etylenes Possible PCBs	• Contamination from mineral cutting oils used historically (1970s) on a now modern manufacturing facility (6 ha, site) • Assessments have been undertaken but have not been made available in the form of data and reports. • Ground water contamination (5-10 PPM), higher soil levels for tri/tetrachlorinated ethenes and etylenes plus suspected PCB contamination • An active corporate program is under development and clean-up options including in-situ steam stripping under study. • Interest expressed in project participation in principle and active technical discussions continuing respecting a partnership upon project implementation. • Preliminary discussion indicates an active corporate program. • To date while general contamination is found no major chemicals/POPs hot spots identified.
	•
PCBs/ Hydrocarbons/other organics and heavy metals	• Substantial oil dumping from automotive scrap. • Also transformer dismantling area with reported direct land dumping of transformer oil including PCBs • Facility slated for re-location with site redevelopment for park land in land exchange between site owner and municipality.

[19] Filiz Karakas, Kadir Gedik, Ipek Imamoglu; "Apportionment of PCB Sources Near a Transformer Maintenance and Repair Facility in Ankara, Turkey", Bull Environ Contam Toxicol (2013) 91:141–147.

Contamination Type	Background/Description/Status
	• Strong municipal interest in project participation but reluctance from current owner who has declined to allow any further investigation pending implementation of new regulations.
PCB	• Transformer dismantling and possible oil dumping • No verification on-site assessment has been undertaken and to date the owner has declined to consider further assessment or action until the regulations are implemented.
OCPs	• Currently an active OCP production facility formally used for DDT and HCH production • Site contamination implied by international NGO published investigation[20] • No verification on-site assessment has been undertaken and to date the owner has declined to consider further assessment or action until the regulations are implemented.
PCB, PAH, hydrocarbons, heavy metals	• Limited assessment by international NGO[21] and academic investigators[22] • No verification on-site assessment has been undertaken and to date the owner has declined to consider further assessment or action until the regulations are implemented
PCB	• Presence of site contamination implied by high PCB (up to 20 pm in sediments downstream from scrap year[23] • No verification on-site assessment has been undertaken and to date the owner has declined to consider further assessment or action until the regulations are implemented.

[20] http://www.ipen.org/ipepweb1/library/ipep_pdf_reports/1tur%20turkey%20kocaeli%20pesticide%20stock%20turkish.pdf

[21] http://www.greenpeaceweb.org/shipbreak/shipsforscrap5.pdf

[22] Elife Kaya, Yetkin Dumanoglu, Melik Kara, Hasan Altiok, Abdurrahman Bayram, Tolga Elbir, Mustafa Odabasi, "Spatial and temporal variation and air–soil exchange of atmospheric PAHs and PCBs in an industrial region", Atmospheric Pollution Research 3 (2012) 435–449

[23] Kadir Gedik & İpek İmamoğlu, "Chemical Mass Balance (CMB) Evaluation of Polychlorinated Biphenyl (PCB) Sources in Sediments of Kızılırmak River, Turkey, Near a Scrap Yard", Environmental Forensics, (2012) 13:1, 39-44,

Technical capacity assessment respecting hazardous waste and contaminated sites management

An assessment of a number of key areas related to national technical capacity specifically related to HW and contaminated site management was undertaken during the PPG, recognizing such capacity is required both to undertake the current project and more importantly sustain progress in managing POPs, HW, contaminated sites generally under a sound chemicals management framework. The aspects assessed and results are as follows:

- General Assessment*:*

In general Turkey has a developing capacity for the management of hazardous waste and provision of the supporting technical services capability. This is resident both in international firms operating in the Turkish market, often in partnership with Turkish firms and institutions, as well as a growing domestic environmental services sector. Overall the country is well serviced with qualified commercial capability in the general areas of environmental assessment, analytical services, geotechnical and civil engineering, and associated project management capability. However, specific to the areas of hazardous waste and chemicals management, and related contaminated sites management the capability while rapidly developing remains somewhat underdeveloped. In the following sections, an assessment of capability currently identified is provided.

- Hazardous waste management infrastructure development: Turkey possesses a growing inventory of hazardous waste management infrastructure being operated commercially by both the private and public sector in response both to increasing effectiveness and enforcement of relevant HW regulations and market drivers associated with corporate environmental responsibility and alignment with EU and OECD country practice. This has been stimulated by several international studies[24,25] in the 2005-2008 period culminating in a MoEU generated Waste Management Action Plan in 2008[26]. Generally these studies suggest a projected mature market for management (treatment and disposal) of between 250,000-350,000 t/year of regulated HW. This includes development of sourced based waste reduction, recycling and treatment capability, storage, transfer station facilities, speciality off-site waste treatment facilities, and larger scale disposal facilities in the form of hazardous waste landfills and incineration facilities. The following provides a brief summary of the specific facilities identified as potentially offering the current project service capability as well as potential for partnership in upgrading capability for POPs management.

    - *İzmit Waste Storage and Incineration Company (İZAYDAŞ)*[27] – This is currently the largest operational HW management facility in Turkey consisting of a 5.4 t/hour (40,000

[24] Technical Assistance for Environmental Heavy-Cost Investment Planning, Turkey - Directive Specific Investment Plan for 2000/76/EC Directive of the European Parliament and of the Council concerning the Incineration of Waste, ENvest Planners, September 2005

[25] "Estimation of industrial hazardous waste quantities in Turkey", EU LIFE06 TCY/TR/292 „HAWAMAN" Project GTZ, September 2008

[26] "Waste Management Action Plan 2008-2012, Ministry of Environment and Forestry, September 2008

[27] http://www.izaydas.com.tr/

t/year) rotary kiln incineration/waste to energy unit, 1 million m^3 engineered hazardous waste landfill as well as a companion industrial/municipal waste landfill (4.25 million m^3) and medical waste sterilization facility. The enterprise also offers supporting secure storage, waste water (leachate) treatment, analytical laboratory capability, and transportation services. It is located in rural area under industrial development on an 800,000 m^2 site in the Kocaeli Municipality, Izmit Province approximately 10 km northeast of Izmit Bay on the Marmara Sea. It was established in 1997 by the Kocaeli Metropolitan Municipality who owns the facility although it operates independently on a commercial basis. The incineration unit was originally designed for waste streams with up to 4% chlorine content and is equipped with a relatively modern air pollution control system and air emission monitoring system which would generally be suitable for processing of chlorinated chemicals waste including POPs wastes when co-disposed with general non-chlorinated HW. However, with the exception of small amounts of DDT and PCBs handled under special permits for regulatory authorities, the incineration facility has to date not handled such wastes on a commercial basis under a restriction of keeping chlorine content less than 1%. Currently, comprehensive air emission evaluations show that the facility would be compliant with the BAT/BEP performance and standards such as the EC Incineration Directive with PCDD/F emissions well below the 0.1 ng TEQ/Nm^3 benchmark level. The enterprise has expressed interest in expanding into this market recognizing the demand created by POPs stockpile s being addressed under the SC. To this end, *İZAYDAŞ* wants to pursue qualification for OCPs and PCB liquid waste streams as well as various upgrading of its materials handling, APC, control and monitoring systems to handle these halogenated waste streams. Additionally, it is considering investment in decontamination of drained PCB transformer shells.

- *MESS Integrated Recycling and Energy Inc. (MESS)*[28]*:* MESS is an enterprise formed and owned by the Turkish Employers' Association of Metal Industries on behalf of its members based on a committed capitalization of 120 million Euro. It has an expressed objective of developing BAT/BEP capability in line with EU standards for its members and the country generally. It currently operates two HW storage and transfer facilities. The Trakya Interim Storage Facility in the Istanbul area has total site area of 9,000 m^2 with 2,500 m^2 covered storage capability. Bursa Interim Storage facility, opened in 2012, is located in the Demirtaş Organized Industrial Zone on a site area of 7,000 m^2 with a 2,000 m^2 covered storage area. A supporting analytical laboratory opened in 2012 at the Trakya facility and licensed transportation services are offered. MESS are currently completing development of a 60,000t/year BAT/BEP rotary kiln HW incineration facility to be located on a closed coal mine site in Kütahya Province at an estimated overall investment cost of 120 million Euros. The feasibility study for this development was completed in 2009 and subsequent given preliminary approval by MoEU. The required Environmental Impact Assessment (EIA) was submitted in 2013 and is currently awaiting MoEU approval (expected in 2015. It is anticipated the facility will be commissioned in 2017. The enterprise has expressed strong interest in pursuing the chemicals waste and

[28] This activity and any government co-finance or GEF finance expenditure for MESS will be realized and kept in the Project Document with condition that Environmental Impact Assessment is approved by the Ministry of Environment and Urbanization.

specifically the POPs market and in partnering with the current project, something that is being strongly encouraged by MoEU officials.

- *Other Incineration Facilities:* There are two other incineration facilities in Turkey nominally handling hazardous waste. One is located at Aliaga, İzmir operated by PETKIM and is a relatively small unit primarily used for flammable liquids and some solid waste. The other is a medical waste incinerator in Kemerburgaz, Istanbul. Neither of these is considered relevant in terms of contributing to chemical and POPs waste destruction capacity addressed in this project. Additionally a second development project involving construction of a large rotary kiln in the Kocaeli-Gebze Industrial Zone exists. This facility involving a 60,000 t/year capacity is being proposed by KİPLASMA Endüstriyel Atık Entegre Bertaraf San. Ve Tic. A.Ş. (Industrial Waste Integrated Elimination) and a foreign partner has proceeded through the feasibility study stage but is on hold pending resolution of siting issues and preparation of an EIA.

- *İstanbul Municipality Environmental Protection and Waste Management Inc. (İSTAÇ)*[29]**:** İSTAÇ is large multi-service waste management enterprise created in 1994 by the greater Istanbul municipality and providing a wide range of solid waste management (SWM) and industrial waste management services including transportation, recycling, landfill disposal and various pre-treatment options. They are currently developing a large waste to energy SWM incineration facility. Additionally the enterprise has developed a range of basic HW management services including a transfer station and storage facility with a current area of 1,000 m^2 and annual capacity of 2,500 t. An additional 1,500 m^2 is to be added. Class 1 landfill capacity of 1.9 million m3 capacity was opened in 2010 with a supporting waste pre-treatment capability (stabilization/solidification). This HW capacity is being expanded in 2014-15 with addition of tank farm and a physical chemical plant (oil recovery units, oxidation / reduction unit, chemical neutralization unit, chemical precipitation unit, sludge dewatering unit). A major overall focus is the preparation of hazardous and industrial waste streams to serve as resource derived fuel for facilities such as cement kilns. Overall İSTAÇ offers limited chemicals and POPs waste management capability but has offered services to the UNEP/MAP project as a staging and transfer location for PCB stockpiles being handled for export by that project.

- *Chimirec Avrasya:* Chimirec, an international HW management company based in France, has a storage/transfer station operation in the Izmir region that handles PCB equipment and other hazardous waste essentially as an export brokerage operation although it does undertake draining, separation and packaging of PCB wastes as well as handling other chlorinated chemicals waste. Currently, PCB equipment is exported for decontamination at a facility in France with and destruction of PCB oil and other POPs waste through partner EU incineration facilities. The enterprise has developed a proposal for a domestic PCB decontamination facility along with mineral oil treatment capability and has indicated it would proceed with this provided a sufficient market to support it. This is understood to depend on full implementation and enforcement of national PCB regulations.

[29] http://www.istac.com.tr/corporative/history.aspx

- *AŞUROĞULLARI Tehlikeli Atıklar Ön İşleme Ara Depolama Nak. ve Hurda San. Dış Tic. Ltd. Şti.:* AŞUROĞULLARI is a general waste management company offering collection, transportation and storage services for municipal and industrial wastes nationally. This includes licensed capability for interim storage of hazardous waste generally and though arrangements with international firms operate as a broker for the export of hazardous waste.

- *Süreko Integrated Waste Management and Waste Energy Generation Incorporated Company:* Süreko is part of a large group pursuing recycling and waste to energy investment in Turkey. Relevant to this project, the company licensed operates collection, transportation, and interim storage in the Aegean and Anatolia regions as a well as an industrial/hazardous waste Class I engineered landfill in Kula, Manisa. The company also provides waste related laboratory services.

- *Anel Doğa Integrated Recycling Inc:* This enterprise operates in the Kocaeli area as a waste manager offering hazardous waste transport and interim storage and pre-treatment capability, primarily related to preparation of waste derived fuel. It also offers brokerage services for the export of hazardous waste.

- *EKOVAR Geri Dönüşüm Makina İnş. San. ve Tic. Ltd. Şti.*: EKOVAR provides industrial and hazardous waste collection, interim storage and recycling services nationally from a base in the Ankara region.

- Technical service provider capability assessment: Another technical capacity aspect investigated during the PPG involved an assessment of engineering and environmental services capability specifically as might be used for site assessment, design, environmental impact assessment (EIA), recognizing the substantial intellectual and technical education capacity the country offers. Turkey has very strong civil engineering and infrastructure design capability that works domestically and internationally. Similarly it has strong industrial and process engineering capability required for construction and upgrading of industrial sectors that may need to be addressed with respect to U-POPs. This is supported by a capable and growing general environmental services sector both with national and branches of international firms. However it generally lacks integration between the two that is characteristic of international capacity when applied to HW and contaminated site management issues, and major environmental industrial modernization. The environmental services capacity is largely oriented toward general EIA and environmental study support but increasingly there is developing capability specific to HW, chemicals and contaminated sites management. Evidence of this is the formal pre-qualification of 9 firms by MoEU for undertaking contaminated site assessment and clean up with additional firms being considered. However, further strengthening of this sector is needed, specifically in relation to site and risk assessment, as well as managing the related institutional and stakeholder consultation and awareness process.

- Field sampling and laboratory capability assessment: Turkey currently has a well-developed system of formal laboratory certification administered by the Turkish Accreditation Agency (TURKAK) which effectively provides equivalency with international certification standards through its international agreements and affiliations. For various Annexed POPs, a total of 98 laboratories are so accredited for various POPs chemicals inclusive of the government/public sector, academic institutions and the private sector. The latter generally provide either internal corporate services or act more broadly as commercial service providers. In some cases both government research establishments such as TÜBİTAK and academic institutions also provide commercial services. Table 7 provides a summary breakdown of the numbers of laboratories accredited in each general sector for analysis of various POPs chemicals of interest. The overall conclusion of this assessment is that there is substantial direct basic capability for provision of analytical support to POPs HW issues, site assessment and site monitoring as well as expanded POPs, HW and chemicals related analytical services. Historically, MoEU has required that all official environmentally related analysis considered for regulatory purposes be undertaken with TÜBİTAK's supervision and approval. However, it is now recognized that given the broad basic capability now available and increasing demand for these services this policy requires re-assessment and greater use of independent laboratories, particularly in the private sector is required, subject to a process of ensuring any gaps related to qualification and training are addressed, something that is identified by MoEU as a priority and which could be assisted by GEF and international experience.

Table 7: Summary of state, academic and private organizations with relevant laboratory capacities related to POPs sampling, monitoring and analysis

POPs Chemical	Government Laboratories	Academic Laboratories	Private Sector Laboratories	Total
POPs pesticides	20	2	36	58
PCBs	9	3	22	34
PCDD/F	1	1	2	43
PBDE	0	0	2	2
PFOS	1	0	0	1

II. Barriers

The main barriers which presently exist in relation to eliminating POPs legacies and reducing POPs releases in Turkey as well as addressing hazardous waste and chemicals management issues generally are identified as the following:

Institutional barriers: Not withstanding Turkey's substantial progress in developing mature effective institutions to address environmental issues, the size and complexity of the country and its political environment inevitably create institutional barriers.

At a policy level these primarily relate to maintaining the appropriate balance between sustaining the country's economic development priorities and social support systems with the increasingly evident need for greater attention to environmental protection generally and particularly dealing with environmental legacies. This demands significant coordination efforts particularly between MoEU and to some extent MoFWA with the primary economic planning authorities, particularly Ministry of Development.

Cordination and communication respecting environmental legacy issues within the framework of the project, remains a periodic challenge across the various stakeholders, at the national level as well as downward through the provincial and local jurisdictional levels involved.. As discussed both above and below in the stakeholder analysis a number of other national ministries have a stake in the project's implementation and will have to be consulted and involved.

Legal and regulatory barriers: The reasonably well developed and developing regulatory framework governing the project and its scope generally facilitates the project's implementation. In the PCB and contaminated sites inventories limited implementation of regulatory measures may present barrier, The project will facilitate expediting this process.This will involve facilitating national PCB phase out plan and in the case of contaminated sites supporting the multiyear implementation cycle. In both cases, an issue that has arisen across MoEU departments that has and will continue to have to be managed is confidentiality of data such as inventories, a restriction that has to some degree inhibited development of project scope and could affect project effectiveness.

Information and awareness barriers: There is an increasing but still limited awareness among stakeholders on environmental legacy issues in Turkey. On the positive side private sector started torecognize historical legacies and deficits in environmental performance as reflected by a number of opportunities the project identified in all its components. Having said that in the Kocaeli Region the interests of the general population regarding pollution issues, HW stockpiles and the performance of processing facilities has been expressed and is noted by both municipal and enterprise officials. In both cases, increasing public information and understanding of solutions is considered important.

Technical capacity and supporting infrastructure barriers: As illustrated in the situation analysis on technical capacity above, there are a number of specific deficits in technical capacities that could present barriers to effective project implementation and achievement of its objectives. While the Project could be implemented using contracted international expertise in these areas, the opportunity also exists to use the project to foster development of sustaining expertise and infrastructure in the country through effective national/international partnerships, particularly with the private sector.

Financial barriers: Financial barriers to addressing the POPs issues are existing in most of the countries.; therefore, there are limitations to efficiently mobilize financial resources to deal with legacy issues. In some cases this is associated with assigning financial liabilities for historical HW stockpiles and contamination between current owners and those originally involved in their creation. Overall, Turkey has not developed a sufficient menu of economic instruments, particularly those involving public private partnerships or legal instruments governing environmental liabilities that have proven effective in addressing such issues in developed countries.

III. Stakeholder analysis

The project has a wide range of national stakeholders as defined along with potential interests and roles in the following. Initial stakeholder analysis and follow up consultation on the project was undertaken during the preparation of the PIF as reported therein and has continued after that time under the auspices of MoEU. During the PPG stage this analysis was updated addressing both institutional stakeholders in the context of their statutory involvement in the project, and more broadly for non-government stakeholders including affected publics. Two major workshops were also held during the PPG, namely: i) Inception Workshop (June 2013), ii), and Final Stakeholder Consultation Workshop (June 2014). Additionally, extensive informal stakeholder consultation was undertaken by national consultants and IA representatives in the course of undertaking PPG study and development work. The following Table 8 details the principal institutional and external stakeholders identified as being involved in the project and their various roles and responsibilities.

Table 8. Roles and functions of principle institutional stakeholder

Ministry/ department/subsidiary organization	Roles and Functions (in accordance with adopted legislation and regulations)
Ministry of Environment and Urbanization (MoEU)	• The overall coordination of policies and strategies regarding prevention of environmental pollution, HW and chemicals waste management, contaminated sites • Developing standards and benchmarks related to the above • Preparing programmes on pollution mappings, education, research, planning and action plans related to the above • Determination and monitoring implementation • Determine and assess the environmental impacts of facilities or activities that have or may have solid, liquid and gas waste releases to the environment • Permitting and audit facilities or activities • Conducting dissemination and awareness rising activities on environmental problems and their solutions • Making collaboration with international bodies, regional centres and other countries on information exchange activities regarding to environmental issues
Ministry of Forestry and Water Management (MoFWA)	• Co-ordination and control related to national water resources management; • Policy for protecting water resources for sustainable use of water; • Monitoring of water discharges and water bodies • Development and application of water quality and discharge standards setting • Acting as GEF Operational Focal Point.
Ministry of Food Agriculture and Livestock	• Control, regulation, licensing and monitoring of registration, production, import, export, sales, use and storage of agricultural chemicals
Ministry of	• Development of public investment policies and plans

Ministry/ department/subsidiary organization	Roles and Functions (in accordance with adopted legislation and regulations)
Development	• Integration of environmental consideration into these • Approval of specific public sector investment related to chemicals and hazardous waste management and site clean-up

External Non-government Stakeholders

In addition to the institutional stakeholders above, a number of non-government stakeholders exist and should be actively aware and engaged in the project. Given the nature of the project and its investment focus, industrial partners are major stakeholders in the project. This includes enterprises holding POPs stockpiles and the associated liabilities as well as the growing community of environmental service providers investing and operating hazardous and chemicals waste management infrastructure and/or providing technical knowledge based services. Additionally this includes the local communities that will be affected by the project and within them ENGOs who would be valuable and knowledge assets for project implementation. Table 9 below provides a general list of such stakeholders and potential interests and roles.

Table 9. Roles and functions of external (non-government) stakeholders

Stakeholder Category/Organization	Interests and Potential Roles
Enterprises either holding POPs, having custody of contaminated sites or are responsible for U-POPs release	• Fulfil the national legislation related to POPs (disposal of POPs and clean-up of contaminated sites; ensure emissions are limited to the given standards; ensure EIA, Environmental Permits are received before start-up of operations). • Increasing recognition and value of addressing environmental legacies for legal, marketing and financial (liability) reasons. • Roles as project beneficiaries, partners and co-financiers.
Local communities and land holders affected by project activities - Neighbouring the Merkim site - Neighbouring Izaydas and other treatment and disposal facilities - Public along HW transport routes - Neighbouring contaminated sites addressed by the project	• Concerns related to impact and risk associated with project related facilities recognizing • Ensuring appropriate environmental benefits are achieved and negative impacts are compensated for. • These communities need to be fully informed of these benefits and potential risks in transparent manner with provision for their informed input and active participation as the project is implemented.
Environmental service	• The project will offer opportunities for a range of

Stakeholder Category/Organization	Interests and Potential Roles
providers - Environmental/engineering consultants - Civil contractors - Transportations firms - Analytical laboratories - Operators of HW handling and storage facilities - Operators of HW treatment and disposal facilities	environmental service providers both in terms of being the primary beneficiary of the project's technical capacity strengthening activities and through business opportunities it may offer, all of which should improve national environmental management capacity and export potential in the future. • To optimize national involvement the project needs to proactively make these stakeholders aware of the project and its potential, as well ensure they are a primary target of training and technical capacity strengthening.
Civil society organizations/ENGOs -	• Concerns and interests of responsible environmental protection and associated public advocacy. • Role in proposing solutions, options and approaches to local issues and concerns • Advocacy for responsible utilization of public resources • Potential roles as partners and service providers in public consultation and awareness initiatives.
Industry associations	• Key focal points for discussion with the private sector • Involvement In activities under components 2 and 3 • Advocacy for industry and trade associations particularly in facilitating awareness and increased sensitivity to legacy issues and technical understanding of solutions.
Academic institutions • Universities/higher education institutions • Non-government research institutes • Primary and secondary schools	• The project offers both a teaching and possible niche R&D stimulation opportunity relative to hazardous waste and contaminated sites management, which have broader long term value to the country, beyond the short term priority of OP management addressed in the project. • Involvement as peer reviewers and potentially direct participants can be fostered by ensuring they are aware of the project's activities. • Involvement as key partners and beneficiaries in national R&D initiatives related to the issue.
General public	• The public generally have both a role and an interest in the project and the broader issues of hazardous waste, chemicals and contaminated sites in recognition of the need to "mainstream" these issues in the overall social consciousness as well as raise their profile for public policy makers. • This should be supported by general public awareness both about the project and the broader long term issues with linkages to more mainstream issues such as SWM being highlighted.
International Organizations International Financial	• The international community, particularly those resident and active in the country, represent stakeholders largely through

Stakeholder Category/Organization	Interests and Potential Roles
Organizations Multi-lateral agencies Bi-lateral assistance agencies International NGOs/civil society organizations	their role in providing key and coordinated international assistance as they have to date. • As such it is important that the project fully acknowledge these past contributions and provide well defined ongoing opportunities for continuing support.

The overall conclusion of the national stakeholder's analysis was that there is uneven awareness and interest of external non-government stakeholders. Associated with this was the conclusion that some technical and management deficits in all stakeholder organizations exist that should be addressed through training and information provision. Finally, a priority should be attached to targeting awareness and consultation initiatives at the local level to those where real or perceived potential impacts may be felt, particularly among those who may have direct exposure to POPs or contaminated sites and that consultation with them on measures being implemented to protect them be emphasized.

IV. Linkages with ongoing projects and country drivenness

The Government of Turkey places a high priority on addressing the reduction of pollution and eliminating related anthropogenic pressures and impacts to the natural and human environment, particularly those associated with historical legacies. This is reflected in the development and implementation of national environmental policies and programs as described above particularly in the context of integration with the national economic development planning cycles and the focus on harmonization with EU policies and practice. It particularly prioritizes waste management both solid waste management (SWM) and hazardous waste management as is reflected in the legal and regulatory framework that is implemented for the country.

Relevant to this project, government commitment relative to hazardous waste, chemicals and contaminated sites management is evidenced by the country's ratification of the all relevant MEAs, notably the Stockholm (2009), and Basel (1993) Conventions, its pending accession to the Rotterdam (1998) Convention, current processing for signing of the Minamata Convention and its participation the SAICM initiative where it has an active designated focal point for coordination of such activities in relation to the international obligations assumed under these MEAs.

Also reflective of the country's commitment and forward view of global chemicals issues is the emphasis placed in the current project in exploring using the expanding national expertise for furthering support on addressing them globally. This is specifically reflected in the development of nationally financed international assistance programs for developing countries in this area and targeted research and development.

In terms of other project linkages, the current project does constitute one of the principle international and national initiatives in the country with respect to hazardous waste, chemicals and contaminated site management. However it has direct and indirect synergies with a number of current and pending international projects as described below and which the project has and will continue to develop cooperative and coordinated ties.

- *EU initiative on regulatory and institutional harmonization:* The project has direct synergy with the ongoing series of initiatives undertaken jointly between Turkey, the European Commission and various member states related to preparing Turkey to EU accession. This is particularly reflected in the extensive and well developed menu of targeted joint national/EU initiatives identified above including the current major initiative related specifically to POPs regulatory harmonization, application of IPPC concepts, the adoption of EU chemicals management approaches and contaminated sites management, all of which constitute major technical assistance co-financing directly complementary to the present investment oriented project, noting the combination of and synergy between these is fundamental to the country's aspirations to move forward as a developed and donor country.

- *Other GEF financed POPs projects:* As described above a number of current GEF projects are active in Turkey. These are all administered through MoEU which ensures overall coordination and linkages that may be productive. Of particular importance in the preparation of this project document is the draft NIP update, completed by UNIDO and the UNEP/MAP project which may serve to address readily available PCB stockpiles noting the substantial increase in these determined by cooperative efforts between the two projects.

- *National Environmental Monitoring Programs:* The project also links to a number of broadly based and targeted government and academic programs monitoring environmental media for chemical and specifically POPs pollutants noted above. These assist Turkey's substantive participation in the GEF/UNEP Global POPs Monitoring Program which the project will facilitate.

V. Strategy and Project Design

The overall strategy and resulting project design detailed herein is consistent with Project's stated objectives related to elimination of principle POPs legacies, namely POPs stockpiles and waste and contaminated sites as defined in Article 6 of the SC, and reduction of POPs release from major source long term sources (Article 5 of the SC). It also recognizes the need for targeted national capacity strengthening to support this strategy and place the country in a position to maintain its long term obligations under the SC, essentially as a fully developed country and prospective EU member state participating in the issue globally as a donor country in the relatively near future. The latter point related to taking Turkey along the final steps to graduation to fully developed status with respect to managing its POPs legacies is the basic strategic principle underpinning the proposed project.

This strategy is implemented through a project design involving five principle project components in addition to the normal Project Monitoring and Evaluation component provision as was defined in the approved PIF and are:

Component 1: Elimination of Current POPs Stockpiles and Waste which directly addresses the management through to elimination of remaining identified POPs pesticides and currently available (existing or being phased out) PCB stockpiles and wastes in the country. This includes in particular a very large single stockpile of essentially pure POPs pesticides (HCH) with the intent of elimination of a globally significant volume of POPs. Additionally, the component supports the qualification of POPs destruction infrastructure in Turkey, specifically HTI facilities that are required for the country to deal with the growing amounts of chemical and particularly chlorinated waste being generated in Turkey.. The Component is defined by three major Outcomes described in detail below corresponding to the POPs pesticides elimination, PCB stockpile elimination, and POPs/Chemicals destruction infrastructure development and qualification. Overall, the successful completion of this component represents a substantial material step in placing Turkey in a similar position to most developed countries with respect to dealing with these types of POPs legacies and in respect to fulfilling the requirements of Article 6 of the SC.

Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpile which covers the planning required for Turkey to complete phase out of PCBs in the country and particularly in regards to addressing the need to deal with residual PCB contamination in non-PCB equipment through demonstration of required de-halogenation technology, all consistent with country obligations under the SC. The general objective of this Component is to support the longer term management of PCBs in Turkey recognizing the ultimate national obligation under the SC to eliminate PCBs in use by 2025 and have them destroyed by 2028. To this end, Component 2 is designed with: i) three primarily TA oriented Outcomes directed to regulatory strengthening, identification of remaining PCBs for management, specifically targeting as yet unaddressed cross contaminated transformers , and development of a national PCB phase out plan; and ii) two investment oriented outcomes intended to develop and demonstrate the physical capacity to cost effectively manage cross contaminated transformers as part of the national phase out plan implementation. These are described in more detail below. Component 2 is co-financed by the firms of the power generation and distribution sector (Bedas, Etimaden, Igdas, Sedas) as well as by manufacturing industries (Turk Sugar Factories) which are large electric consumers and hence manage large numbers of electric equipment containing dielectric oil, which may be potentially contaminated by PCBs.

Component 3: Unintended POPs Release Reduction covers point source identification, facility evaluation, U-POPs releases assessment and monitoring, and BAT/BEP abatement investment demonstration activities related to primary sectoral sources of U-POPs release as identified in the NIP and the UNIDO NIP Update Project (2014). According to the results of the completed UNIDO NIP Update Project (2014), the ferrous and non-ferrous metal industry is responsible for the majority of the emissions to air comprising 50% of the total emissions to air and approximately 12% of the estimated total PCDD/F emissions. BAT/BEP will be demonstrated in priority sectors with the general purpose to show their effectiveness and their cost. Addressing U-POPs release reduction through implementation of BAT/BEP has been one of the priority POPs issues identified in the NIP. The demonstration will follow an experimental design, based on the thorough characterisation of operational conditions, emission sampling and analysis for both the "business as usual" and BAT/BEP conditions. At the time of project preparation, participation of two sinter plants (Kardemir ISP and Isdemir ISP) from the iron and steel sector has been secured whilst industries from other priority sectors (non-ferrous metals and others) although declared their interest, were not able to ratify an agreement due to current uncertainties in their investment plans. Therefore, for the industrial sectors which will join after project approval, a specific financial mechanism based on eligibility criteria and partnership conditions will be established as detailed in this document. Additionally it will support this with targeted TA aimed at achieving long term progressive U-POPs release reduction in the country and the knowledge base needed to monitor this reduction.

From the technological point of view, the Component also has an objective to enable Turkey to move towards widespread utilization of BAT/BEP in the iron and steel sector so as to ensure the reduction of U-POPs emissions according to the requirement of the SC.

From the point of implementation strategy, the Component will also make an important contribution to the promotion of mechanisms which can increase awareness and education about U-POPs, to the development, support and strengthening of technical capabilities in processes, techniques and practices that avoid the formation and release of such chemicals in the iron and steel sector, and to provide the basis for the development of further research and monitoring programs, in co-operation with the national authorities that have primary responsibility for the implementation of the SC.

Component 4: *Management Capacity for Contaminated Sites* covers supporting the implementation of the regulatory framework now being put in place to deal with contaminated sites, particularly those related to chemical and POPs waste. This target support for key technical management tools along with undertaking demonstration assessment, clean-up design, containment, and monitoring of several priority POPs and chemicals waste contaminated sites and analysis of potential sites and implementation of remediation studies in pilot scale.. This targeted technical assistance delivered in complementarilywith extensive support from private sector in this area.

As described above in Section I, Turkey has embarked on an ambitious program that will begin to systematically deal with the contaminated sites issue on a comprehensive basis. This component of the project will link to the implementation of this program and specifically the regulatory framework being introduced through two principle Outcomes and associated Outputs/Activities as described below.

Based on the above, the Component has been designed with two components. Outcome 4.1 will provide technical assistance with partners focus at the national level.. It is aimed at providing key technical support in some specific areas involved in thetesting , namely operationalizing the key

systems provided for by the national regulations, development of site clean-up through pilot applications; supporting awareness, and training in several key subject areas where capacity strengthening is needed... Outcome 4.2 will involve a combination of general support related to site assessment, clean up design and technology studies administered through MoEU during implementation of its regulations and more targeted specific pilot clean up initiatives that will serve to demonstrate the application of a variety of priority POPs and chemical contaminate situations which can potentially be replicated. The scope of GEF support will focuson the site specific demonstration activities on selected priority sites under agreements with site holders, with resources directed to the required front end detailed site assessment/clean up design work as well as initiation of clean-up work, largely through immediate containment and monitoring measures. The parallel private resources and committed from BOSCH and MOEU's in kind contributions would provide substantive support for more the general site assessment, technology study, supervision and technical clearance activities being undertaken directly through MoEU's implementation process associated with the new regulations.

Component 5: Institutional and Regulatory Capacity Strengthening for Sound Chemicals Management covers supporting technical assistance related to improvement of the general legal/regulatory framework and technical capacity for hazardous waste and contaminated sites management within the developing national chemicals management framework. This Component encompasses the final stage of Turkey's efforts to be become fully compliant with the SC from an institutional and regulatory perspective. It is based on a strategy that adopts a path of harmonization of the national legal and regulatory environmental framework for sound chemicals management with that of the EU. The development of the current GEF project, starting in 2011, with its emphasis on dealing with POPs and chemical waste legacies underpins this strategy and substantively facilitates its effectiveness. This is accomplished through operationalizing the evolving advanced legal and regulatory framework and strengthened practical technical capacity required to support it, all allowing achievement of primary SC compliance on the ground. These technical capacity aspects generally reflect the focus of GEF resources as reflected in the other components of the project detailed above.

The detailed project design inclusive of cost estimates is elaborated by Component against each outcome and output/activities in Table 10 below. Within the context of GEF projects, "in-kind co-financing" refers to goods, services and transactions not involving money. Examples are when a government entity and other co-financing partners provide office space, vehicles, staff time, physical facilities/buildings, land, etc. as additional resources which can be used by the project to achieve its objectives. "Cash co-financing" is relevant in projects that deal with private sector entities which benefit from the GEF grant. In such cases the GEF expects that, in addition to benefitting from the GEF grant which covers various pilot technology demonstrations, private sector entities can also co-finance such demonstrations by contributing their companies' resources that are invested in their enterprises by their owner(s) and/or shareholder(s). In financial terms it is invested money that, in contrast to debt capital, is not repaid to the investors in the normal course of business[30].

Detailed descriptions follow in this Section. This is further defined in Annex A in the Project Results Framework in terms of indicators, corresponding baseline and project cycle targeted outputs.

[30] UNIDO-GEF Cooperation, Project Operating Manual, Version 2.0, 17 December 2014.

Table 10: Elaborated project design framework and cost estimate by Outcome and Output/Activity

Outcome	Activity/Output		Co-Financing (USD)				
		GEF grant	Cash	In-Kind	Parallel	Subtotal	Total
Component 1 - Elimination of Current POPs Stockpiles/Wastes							
Outcome 1.1 Elimination and infrastructure removal from remaining POPs pesticide storage sites	1.1.1 Detailed site assessment operational planning, EIA and tender documents for Merkim site POPs pesticide stockpile	200,000	20,000 (Merkim)	15,000 (MoEU/ 5,000)		35,000	235,000
	1.1.2 Removal and destruction of Merkim POPs pesticides and waste.	3,292,000	3,058,000 (Merkim)	335,000 (MOEU, 25,000)	-	3,393,000	6,685,000
	1.1.3 Demolition, removal and disposal of Merkim site infrastructure	-	570,000 (Merkim)	35,000		605,000	605,000
	1.1.4 Remediation of the Merkim site.	50,000	100,000 (Merkim)	10,000	-	110,000	160,000
	1.1.5 Supporting Training.	25,000	-	25,000	-	25,000	50,000
	1.1.6 Supporting Public Awareness and Consultation	24,000	-	30,000 (MoEU, 20,000)		30,000	54,000
	1.1.7 Obsolete pesticide stockpiles elimination	54,000	120,000 (MoFAL)	30,000 (MoFAL)		150,000	204,000
	Outcome 1.1. Sub-Total	**3,645,000**	**3,868,000**	**480,000**	**-**	**4,348,000**	**7,993,000**
Outcome 1.2 Elimination of high concentration PCBs and PCB containing equipment stockpiles.	1.2.1 Packaging, transport and disposal of available PCB stockpiles	700,000	4,456,935 (Private Sect.)	364,000		4,820,935	5,520,935
	Outcome 1.2. Sub-Total	**700,000**	**4,456,935**	**364,000**	**-**	**4,820,935**	**5,520,935**
Outcome 1.3 Qualification of existing and developing national POPs destruction facilities.	1.3.1 Facility Upgrades at İZAYDAŞ	750,000	1,171,000 (İzaydaş)	1,207,000	1,850,000	4,228,000	4,978,000
	1.3.2 Test burns at İZAYDAŞ	100,000		491,000	376,000	867,000	967,000
	1.3.3 Supporting public consultation	25,000	25,000 (İzaydaş)	35,000 (MOEU, 10,000)		60,000	85,000
	1.3.4 Test burns at MESS	100,000		450,000	10,500,000	10,950,000	11,050,000
	1.3.5 Supporting public consultation	25,000	25,000 (MESS)	35,000 (MOEU, 10,000)		60,000	85,000
	Outcome 1.3. Sub-Total	**1,000,000**	**1,221,000**	**2,218,000**	**12,726,000**	**16,165,000**	**17,165,000**
Component 1 - Totals		**5,345,000**	**9,545,935**	**3,062,000**	**12,726,000**	**25,333,935**	**30,678,935**
Component 2 - Planning/Capacity Building for Environmentally Sound Management of Future PCB Stockpiles							
Outcome 2.1: Implementation of national PCB regulation	2.1.1 Technical annex and guidance documents to the existing PCB regulation developed and implemented.	30,000		20,000 (MOEU)		20,000	100,000

	2.1.2 Capacity of the relevant authority for monitoring, measuring and reporting the implementation of the existing PCB regulation enhanced.	50,000					
Outcome 2.2: Systematic approach for the analytical determination of PCBs in electrical equipment, labelling and inventory	2.2.1 Training on PCB equipment identification and labelling.	20,000	629,499 (Private Sect.)	6,739,262		7,368,761	7,628,761
	2.2.2 Sampling and analysis of at least 8,000 transformers in-use or stored for maintenance for checking their contamination by PCBs.	220,000					
	2.2.3. Update of the existing PCB inventory and identification of PCB containing equipment from 50 to 500 ppm and greater than 500 ppm as required by the SC.	20,000					
Outcome 2.3: Development and adoption of a National PCB Equipment Treatment, Phase out and Retirement Plan	2.3.1 Consultation with the main stakeholders from the power generation and distribution sector and large electricity consumers to identify PCB management plan priorities and develop the PCB management plan.	30,000		20,000 (MOEU)		20,000	80,000
	2.3.2 Promotion of adoption and development of an implementation strategy for the PCB management plan	30,000					
Outcome 2.4: Improvement of storage and maintenance of cross contaminated PCB equipment	2.4.1. Standards and Guidance Documents for prioritizing, maintenance, and handling of PCB contaminated equipment in use or under maintenance .	30,000	629,499 (Private Sect.)	5,186,388		5,815,887	7,115,887
	2.4.2. Adoption of physical or operational measures for preventing release of PCB or human exposure to PCB from equipment on-line, in-use or under maintenance.	200,000					
Outcome 2.5: Verification of decontamination technology for PCB contaminated transformers remaining in service and demonstrating it on a pilot basis.	2.5.1 Verification of the technological options for the treatment of on-line or stored transformers for maintenance.	30,000					
	2.5.2 Selection, procurement and testing of equipment for the treatment of PCB contaminated transformers.	200,000					
	2.5.3 Pilot demonstration of the treatment of PCB contaminated equipment	840,000					
Component 2 - Totals		**1,700,000**	**1,258,998**	**11,965,650**	**-**	**13,224,648**	**14,924,648**
Component 3 - Unintended POPs Release Reduction							

Outcome 3.1: Determination and verification on an enterprise level of source and technology specific U-POPs emissions	3.1.1 Determination of current PCDD/F emission factor – Iron and steel industry (sintering plants) and/or Electric Arc Furnace (EAF) Steel Making Plants) non-ferrous metal industry (copper, aluminium and zinc production) and other priority sectors.	460,000	2,760,000 (Private Sect.)			2,760,000	3,220,000
	3.1.2 Training on PCDD/F sampling and analysis at industrial stacks						
Outcome 3.2: Provision of training and technical assistance on BAT/BEP for priority industrial sectors	3.2.1 Training delivered on U-POPs inventory, sampling and analysis	50,000		50,000 (MoEU)		50,000	180,000
	3.2.2 Training of at least 50 technical professionals on BAT-BEPs in 10 priority industrial sectors	80,000					
Outcome 3.3: Development of a national U-POPs Release Reduction Plan	3.3.1 Assessment of the regulatory gaps with reference to SC requirement and EU-IPPC regulation and proposed amendments	20,000		100,000 (MoEU)		100,000	160,000
	3.3.2 Identification of areas with the highest priorities and cost/effectiveness in term of U-POPs reduction	20,000					
	3.3.3 Development of the national U-POPs release reduction plan with risk-based and cost/effectiveness priorities.	20,000					
Outcome 3.4 Demonstration of BAT/BEP in industrial priority source categories	3.4.1. Demonstration based on assessment of BAT/BEP in the iron and steel sector (sintering plants and electric arc furnace) and in the non-ferrous metals sectors (copper, zinc, aluminum))	1,350,000	17,960,000 (Private Sect.)			17,960,000	19,310,000
Component 3 - Total		**2,000,000**	**20,720,000**	**150,000**		**20,870,000**	**22,870,000**
Component 4: Management Capacity for POPs Contaminated Sites							
Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	4.1.1: Technical support provided for implementation and administration of the three primary systems under the regulation and supporting policy - Contaminated Sites Identification and Registration System (CSIRS), Contaminated Sites Evaluation System (CSES), and Contaminated Sites Clean-Up System (CSCS)	100,000		525,000		525,000	625,000
	4.1.2 Technical support in developing mechanisms for financing contaminated site clean-up under the regulations.	50,000		625,000		625,000	675,000
	4.1.3 Stakeholder awareness and support in regulation and	50,000		425,000		425,000	475,000

	associated component system delivered						
	4.1.4 Training program development and delivery for site assessment including application of risk assessment methodologies, remediation technology demonstration and selection.	100,000		550,000		550,000	650,000
	Outcome 4.1. Sub-Total	300,000		2,125,000 (MOEU)		2,125,000	2,425,000
Outcome 4.2: Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	4.2.1: Funding initial site assessment, clean up design and technology option analysis for prioritized regulatory action	100,000	500,000 (Private Sect.)	50,000	1,000,000	1,550,000	1,650,000
	4.2.2: Undertaking demonstration contaminated site clean ups.	300,000	1,200,000 (Private Sect.)	50,000	1,100,000	2,350,000	2,650,000
	Outcome 4.2. Sub-Total	400,000	1,700,000	100,000 (MOEU)	2,100,000	3.900,000	4,300,000
Component 4 -Totals		**700,000**	**1,700,000**	**2,225,000**	**2,100,000**	**6,025,000**	**6,725,000**
Component 5 : Institutional/ Regulatory Capacity Strengthening for POPs and Sound Chemicals Management							
Outcome 5.1: Legislative framework updated consistent with Convention obligations adopted	5.1.1 Harmonization of POPs related legislation and regulation with current SC obligations and relevant EU Directives	25,000	50,000 (MOEU to EU)	50,000	1,260,000	1,360,000	1,385,000
	5.1.2 Implementation of Rotterdam Convention supported through enabling activities.	25,000	140,000 (MOEU to EU)	25,000	1,260,000	1,425,000	1,450,000
	5.1.3 Identify national capacities and potential cooperation for POPs and chemicals management and develop a national POPs and chemicals waste management capacity needs assessment.	100,000	100,000 (cash-MOEU)	25,000		125,000	235,000
	Outcome 5.1. Sub-Total	150,000	290,000	100,000 (MOEU)	2,520,000 (EU)	2,910,000	3,070,000
Outcome 5.2: Strengthened technical capacity including operational POPs monitoring, supporting analytical capability, and planning related research and development capability	5.2.1 Operational POPs monitoring and participation in the Global POPs network	75,000	9,290,000 (MoFWA)	75,000 (MOEU)	-	9,365,000	9,440,000
	5.2.2 Qualification undertaken with additional laboratories for regulatory purposes related to POPS and contaminated sites activities	150,000	530,000 (Private Sect.)	828,000		1,358,000	1,508,000
	Outcome 5.2. Sub-Total	225,000	9,820,000	903,000	-	10,723,000	10,948,000
Outcome 5.3: Development and implementation of modern tools for a	5.3.1 Delivered training on sound chemicals management to 200 institutional and industry professionals and stakeholders	25,000	40,000	25,000		65,000	90,000

national sound chemicals management framework	5.3.2 Delivered general chemicals management awareness materials to the general public in the form of information products and public events	50,000	50,000	110,000		160,000	210,000
	Outcome 5.3. Sub-total	**75,000**	**90,000** (MOEU to EU)	**135,000** (MOEU)	**-**	**225,000**	**300,000**
Component 5 Totals		**460,000**	**10,200,000**	**1,138,000**	**2,520,000**	**13,868,000**	**14,318,000**
Component 6 - Project Monitoring and Evaluation		100,000		388,000		388,000	**488,000**
	Project Sub-Totals	10,305,000	43,774,933	16,778,650	19,146,000	79,709,583	**90,004,583**
Project Management Costs		510000		830000		830,000	**1,340,000**
	Total Project Costs	**10,815,000**	**43,574,933**	**19,608,650**	**17,346,000**	**80,529,583**	**91,344,583**

Component 1: Elimination of Current POPs Stockpiles and Wastes (GEF Finance - US$5,345,000 ; co-finance - US$25,333,935)

This component is designed to address the two remaining traditional POPs stockpiles in the country, namely a global significant POPs pesticides stockpile and to accelerate dealing with the PCB equipment removed from service to stockpiles during the project. Additionally, the component supports the qualification of POPs destruction infrastructure in Turkey, specifically HTI facilities that are required for the country to deal with the growing amounts of chemical and particularly chlorinated waste being generated, as well as potentially offer such capability for the region generally. The Component is defined by three major Outcomes described in detail below corresponding to the POPs pesticides elimination, PCB stockpile elimination, and POPs/Chemicals destruction infrastructure development and qualification. Overall, the successful completion of this component represents a substantial material step in placing Turkey in a similar position to most developed countries with respect to dealing with these types of POPs legacies and in respect to fulfilling the requirements of Article 6 of the SC.

Outcome 1.1 (Elimination and Infrastructure removal from remaining POPs pesticide storage sites): This outcome covers activities to be undertaken primarily in relation to elimination of POPs pesticides and related POPs wastes at the Merkim storage site. This will involve an initiating detailed assessment and planning phase, followed by packaging and removal of the POPs stockpiles and their transport for environmentally sound destruction. This will be followed by industrial cleaning of the structure interior and the similar off-site destruction of these materials, the demolition of the structure and its removal for disposal, and finally the physical clean-up of the overall site to a state suitable for future industrial/commercial land use. As a separate activity, the elimination of a minor stockpile of obsolete pesticides in the hands of public sector agencies will be provided for. It is anticipated that all activities will be completed and outputs delivered with the first two and half years of project initiation with the principal variable being the rate at which the contracted disposal facility or facilities can accept the highly chlorinated POPs waste, and potentially at one or more qualified competitive facilities in Turkey subject to their availability in Turkey (Outcome 1.3).

- *Output/Activity 1.1.1 – Detailed site assessment, operational planning, EA, and tender documents for Merkim site POPs pesticide stockpile*: This activity involves undertaking the necessary detailed work to plan, obtain required approvals, and prepare the tender documents to proceed with the contracting of the work involved in dealing with the stockpiled material on the Merkim site as well as undertake works associated with removing the structure and cleaning up site contamination. This activity will be primarily GEF financed and undertaken by a qualified, competitively selected, consultant combining both international and national expertise, and the scope of the contract will extend to provision of implementation supervision in association with Merkim's staff. It is currently understood that no formal EIA is required for this work under Turkish regulation but an Environmental Assessment (EA) and associated Environmental Management Plan (EMP) will be developed consistent with international safeguards practice. Oversight involvement of local environmental authorities is also anticipated.

- *Output/Activity 1.1.2 – Removal and destruction of Merkim POPs pesticides and waste:* This activity covers the packaging, removal and destruction of the POPs pesticides stockpiles and associated internal clean up residuals in the Merkim warehouse as follows:

    - Onsite packaging, removal and internal decontamination: Recognizing the potential for external contaminated particulate release during this kind of an operation the conceptual approach would involve the following: i) sealing of the building; ii) provision of secure air tight entrance and exit points for materials and labour; iii) organization of the internal space into a separate packaging and container/trailer loading area with particulate transfer barriers between them (i.e. designated clean and contaminated areas with the clean area having vehicle and materials handling access); iv) similar designations applied for workers with change room and transitional space provided; and v) filtered air exchange. The packaging configuration would depend on the selected disposal contract but a preference would exist for packaging in 1 m^3 UN approved "big bags" with an alternative of HDPE barrels. It is anticipated packaged POPs waste will be placed in standard water proof shipping containers placed in the decontaminated area and removed by roll on/roll off vehicles, either directly to final destination, a transhipment point, or potentially secure interim storage. Internal cleaning of residues from floors, walls and the structure generally would be accomplished with industrial vacuum equipment. The process of packaging and decontamination would work through the building systematically with designated areas (inclusive of transitional barriers) being reclassified from contaminated to decontaminated categories. After completion of removal of all materials, a final industrial cleaning would be undertaken to all areas now designated as decontaminated. To the extent practical the above operations would be mechanized with appropriately scaled equipment operating in the contaminated areas but would also involve substantial manual labour. All labour within the areas designated as contaminated would require full body and face PPE including a respirator. In nominally decontaminated areas all labour would require full body HazMat suits, appropriately rated fabric month/nose masks, gloves and safety glasses and hard hats. Appropriate training (Activity1.1.5) and coverage with a contractually binding comprehensive health and safety system procedure manual would apply.

- Transport and interim storage: Licensed hazardous waste/dangerous goods vehicles and operators will be employed to remove the containerized material from the site to one of a number of optional destinations depending on logistics and contracting arrangements. These could range from direct transport to the designated destruction facility, to dockside storage for sea /export transport to the designated destruction facility, or to an interim storage licensed location.
- POPs waste destruction: Environmentally sound disposal of the POPs waste extracted from the building is anticipated to be undertaken by high temperature incineration (HTI) at pre-qualified facilities located in Western Europe and potentially in Turkey. The selection of the facility or facilities used will be in accordance with a proven performance based technical specification whose requirements will be consistent with the prevailing international guidance documents issued by the Basel Convention[31] and the GEF STAP[32]. The principle performance specifications will include a demonstrated capability to achieve a destruction efficiency (DE) of 99.99%, destruction removal efficiency of 99.9999%, and a maximum PCDD/F emission limit of 0.1 ng TEQ/Nm^3. Assurance of a complete accounting and tracking of all material from source through to final destruction, supported by appropriate documentation and legally binding certification will be provided for.

The contracting of this activity and its various aspects is anticipated to be undertaken under a turnkey contract with a firm or joint venture experienced in undertaking this kind of integrated hazardous waste management activity inclusive of both the on-site, transportation, interim storage (as required) and final destruction. A two stage internationally advertised tendering process in accordance with established UNDP procedures and having a turn-key scope will be used. The first stage will involve submission of an Expression of Interest (EOI) inclusive of technical and execution capability qualifications. The second stage would involve a detailed technical and execution proposal as well as a commercial proposal based on a composite guaranteed all in a price expressed in $/t. The cost estimates for the work used in this document (assuming 2,800 t of stockpiles POPs pesticides and residual POPs wastes) are based on national estimates obtained by Merkim for onsite and local transportation, and current on UNDP and other IA experience on recent GEF projects involving packaging and export of similar wastes for destruction in Western Europe.

- *Output/Activity 1.1.3 – Demolition, removal and disposal of Merkim site infrastructure:* Following the completion of POPs pesticide removal and final decontamination of the warehouse structure, the intention is to clear the site by demolition of the buildings and removal of this material for environmentally sound disposal. The total quantity of such material has been estimated to be 4,000 t. It is anticipated that the decontamination of the building materials would be comprehensive enough to permit the residual materials to be consider non-hazardous demolition waste suitable for disposal in a commercial industrial waste landfill or where feasible be recycled. This will be determined analytically and subject to environmental authority approval. However, in the absence of this determination, a conservative approach to estimating these costs has been taken and it is assumed that the material will instead be directed to a licensed, engineered hazardous waste landfill using a current commercial tipping fee

[31] http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tg-POPs.pdf

[32] http://www.stapgef.org/selection-of-persistent-organic-pollutant-disposal-technology-for-the-gef/

(US$130/t). This activity will be entirely financed by Merkim, including contracting of demolition, transport and disposal as well as supervision.

- *Activity 1.1.4 – Remediation of the Merkim site:* Following clearing of the site, a detailed site assessment will be undertaken, recognizing that preliminary work undertaken during the PPG has shown the presence of surficial soil contamination. This would be followed by remediation measures, implementation of a monitoring program and site restoration all subject to national and local regulatory approvals. It is premature to fix a specific approach to the site remediation but based on present knowledge, a simple approach would be the removal of a surface layer to a depth where the levels are below current soil quality standards for commercial/industrial development. This material would generally be suitable for land disposal in licensed engineered HW landfill, although areas identified as hot spots might be packaged and disposed of by HTI. For cost estimating purposes the removal and replacement of 200 m^3 of soil is assumed. The site would then be covered and restored to a natural state pending re-development in an appropriate land use with the installation and operation of a ground water monitoring capability. In terms of financing, GEF funds have been allocated to support site assessment, clean up design and establishing a monitoring capability. Merkim will finance the remediation works and long term operational monitoring according to national regulations.

- *Output/Activity 1.1.5 – Supporting Training:* This activity provides for operational and safeguards training applicable to hazardous waste and contaminated site management including site excavation, packaging and restoration operations, all based on current national and international standards. It is estimated that 20 national technical staff will be trained for work on or related to the site at various levels including performance of required works and its supervision. Individuals receiving training will primarily be local contractor's staff and Merkim staff but would also extend to staff from local environmental and other regulatory authorities. GEF funds will be used to support preparation materials and international inputs to this training program using standard manuals and reference documents such as those available from the Basel Convention and FAO. This will be matched by participant organizations covering participants DSA, transportation etc..

- *Output/Activity 1.1.6 – Supporting public awareness and consultation:* This activity covers the public consultation and awareness work with local stakeholders in the immediate area of the Merkim site and local authorities. It is proposed that this work would be locally contracted with a neutral public interest and/or independent academic organization. It would administer a program in advance of and throughout the period of work on the site and be would be closely coordinated with Merkim, the site contractor(s) and local authorities. The contracting of activity this work locally will be GEF funded with MOEU in-kind and other contributions from Merkim.

- *Output/Activity 1.1.7 – Obsolete pesticide stockpiles elimination:* This activity will involve coverage of disposal costs applicable to up to 30 t of expired pesticides using GEF funds to be consolidated and packaged by a program administered by the MoFAL. This material will be

included in the disposal contracting for POPs pesticides from the Merkim site. MoFAL will finance all other costs.

Outcome 1.2 – Elimination of high concentration PCBs and PCB containing equipment stockpiles: This Project outcome covers activities and outputs associated with the collection, packaging and export of PCBs and PCB contaminated equipment surrendered as a result of phase out activities in the course of the project. This is separate but complementary to the stockpile elimination program involving an estimated 500 t of existing stockpiles planned to be handled using GEF funds under the UNEP/MAP, Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem (MedPartnership), component 2.3, related to PCB removal, in 2014, and the work directed to addressing mineral oil transformers cross contaminated with PCBs under Component 2. As noted below, based on commitments made during the PPG stage 507 t of PCB based equipment has been identified as slated for phase out and elimination over the life of the project and would be the primary focus of this Outcome.

- *Output/Activity 1.2.1 –Packaging, transport and disposal of available PCB stockpiles:* Based on work undertaken during the PPG, this activity will focus on work in 2 major enterprises who have come forward with PCB based equipment that they are in the process of phasing out and replacing from their operational and/or spares inventories. These enterprises are Erdemir and İsdemir. Annex H provides a summary of the PCB based equipment these enterprises have identified for phase out and replacement. In total 507 t of PCB based equipment, inclusive of approximately 180 t of PCB di-electric oil is available for packaging, collection and environmentally sound destruction under this activity. The arrangement between the project and these enterprises will be based on the allocation of US$700,000 in GEF funds to cover all or a portion of packaging, transportation and destruction costs for such equipment. The primary co-financing obligation of the enterprises will be the replacement costs inclusive of removal, secure storage, and purchase/installation of replacement equipment. Based on a conservative estimate of current market pricing for environmentally sound destruction costs the above GEF allocation is would account for at least 350 t of this equipment. While this remains less than the equipment available for disposal, if lower unit disposal costs are obtained commercially, this quantity would increase. Likewise, where an enterprise wants to increase the amount eliminated, they will be offered the option of adding equipment to the project contract and contributing additional co-financing to cover the disposal. The basic incremental co-financing available through the replacement of PCB based equipment is estimated to be US$4,820,935 for replacement and removal and re-installation of new equipment, as well as various relatively minor activities such as sampling and record keeping.

  With respect to contracting arrangements, it is anticipated that a competitively bid turnkey contract will be established under UNDP procedures. This will cover the collection of the equipment as available at secure interim storage facilities at the selected enterprises, transport for processing, and environmentally sound PCB destruction. Destruction will likely involve export to qualified facilities in the EU capable of decontaminating equipment components suitable for subsequent recycling, and providing for environmentally sound destruction of PCB based dielectric oil and other contaminated materials to the same standards referenced above for POPs pesticides. The alternative of doing some of these activities in Turkey would not be excluded where qualified capability is developed and demonstrated during the project.

Outcome 1.3 – Qualification of existing and developing POPs destruction facilities: This Project Outcome covers activities and outputs associated with technical qualification and upgrading to international standards of the existing İZAYDAŞ HTI facility in Izmit, and qualification of the MSG facility that is under development in Kütahya.

- *Output/Activity 1.3.1 – Facility Upgrades at* İZAYDAŞ*:* As described in Section I, İZAYDAŞ is the principle HW destruction facility in the country having well-developed infrastructure and generally employing BAT/BEP appropriate for its current waste market. However, the facility has operated with limitations on chlorine content that have limited its ability to handle a full range of chemical waste streams, particularly POPs wastes. To address this and further enhance its capacity and environmental performance, the enterprise will undertake a major investment program in association with the project such that it will be able to offer a competitive commercial capability to destroy POPs and chemical wastes generally. This will be primarily financed by the enterprise with some selected GEF investment in key aspects that will directly further this capability, particularly in relation to ensuring environmentally sound handling of POPs wastes and on further reducing potential U-POPs emissions, particularly PCDD/F. Additionally, the enterprise will also undertake a significant amount of additional general upgrading and investment that furthers its capability and fully maintains its status respecting the application of BAT/BEP, a portion of which should be considered incremental in terms of enhancing the POPs and Chemicals HW capability targeted by the project. Table 11 summarizes the various investment items involved along with the proposed allocation of GEF funding, including the assumptions used to allocate incremental investment associated with the GEF Project. Additional investment in a shop intended to drain and decontaminate PCB transformers is understudy and is anticipated to be an addition enterprise investment, although not accounted for in the current co-financing.

Table 11: İZAYDAŞ Investment Program including GEF investment support.

Investment Activity	Estimated Costs (US$)				Notes
	Total	Enterprise[33]			
		Enterprise Total	Project Allocation	GEF	
Speciality storage area upgrade	560,000	460,000	460,000	100,000	• Development of dedicated segregated secure storage for chlorinated/POPs waste to allow stockpiling for maximizing feed utilization within new chlorine limits. • GEF contribution in speciality handling, safety and fire protection equipment • Project allocation approximately 100% of total investment

[33] In the table only the POPs related financial figures of the Enterprise is reflected as project allocation in order to distinguish POPs related investment from the overall Enterprise investment figure. Only the POPs related investment figures are reported in Table 10.

Investment Activity	Estimated Costs (US$)				Notes
	Total	Enterprise[33]			
		Enterprise Total	Project Allocation	GEF	
Feed system and associate materials handling upgrade	505,000	70,000	70,000	435,000	• Installing independent liquid and solid waste feed systems for POPs to avoid operational cross contamination • GEF contribution for tankage, flow metering and custom piping. • Project allocation approximately 100% of total investment
Programmable Logic Control (PLC) upgrade	706,000	606,000	360,000	100,000	• System upgrade for chlorinated waste blending and APC control. • GEF contribution for speciality equipment • Project allocation approximately 60% of total investment
Granulated Activated Carbon (GAC) saturation monitoring system	91,000	41,000	41,000	50,000	• Added capacity for PCDD/F emission control. • GEF contribution to equipment purchase Project allocation approximately 100% of total investment
APC system upgrades for PCDD/F and other emission reduction	120,000	55,000	55,000	65,000	• Added capacity for PCDD/F emission control. • GEF contribution to equipment purchase • Project allocation approximately 100% of total investment
Independent environmental performance evaluations 2012-13	100,000	100,000	50,000	-	• Monitoring program to establish PPG qualification performance baseline • Project allocation approximately 50% of total investment
Aerosol treatment system	275,000	275,000	100,000	-	• Installation for destruction of chemical residuals in aerosol cans classed as HW (paint solvents, ODS propellants, isobutene) Project allocation approximately 35% of total investment
Upgraded explosion protection system	20,000	20,000	10,000	-	• Safety related investment associated with expanded and higher risk chlorinated waste streams • Project allocation approximately 50% of total investment
Laboratory upgrade investment	70,000	70,000	35,000	-	• Addition of equipment for POPs pesticide and PCB feed analysis • Project allocation approximately 50% of total investment
Energy recovery turbine upgrade/optimization	914,000	914,000	275,000	-	• General investment but accelerated with addition of

Investment Activity	Estimated Costs (US$)				Notes
	Total	Enterprise[33]			
		Enterprise Total	Project Allocation	GEF	
					higher end chlorinated waste market • Project allocation approximately 30% of total investment
Annual flue gas monitoring (4 years)	110,000	110,000	65,000	-	• Incremental costs due to additional monitoring • Project allocation approximately 50% of total investment
PCDD/F column renewal (4 years)	366,000	366,000	185,000	-	• Incremental cost associated with higher chlorine feed • Project allocation approximately 50% of total investment
Incremental Refractory renewal (4 years)	1,052,000	1,052,000	525,000	-	• Incremental cost associated with higher chlorine feed • Project allocation approximately 50% of total investment
Incremental GAC materials for added system (4 years)	1,600,000	1,600,000	800,000	-	• Incremental cost associated with higher chlorine feed • Project allocation approximately 50% of total investment
Upgraded waste water treatment unit	2,514,000	2,514,000	1,257,000	-	• General investment but accelerated given addition of chlorinated waste streams • Project allocation approximately 50% of total investment
Totals	**9,113,000**	**8,363,000**	**4,288,000**	**750,000**	

- *Output/Activity 1.3.2 – Test burns at İZAYDAŞ:* This activity covers a test burn program intended to qualify a POPs pesticide waste stream (HCH by product materials from Merkim) and high concentration PCB dielectric oil. The conceptual design of the test burn program is based on the unit being run on a steady state basis using a baseline waste stream generally representative of a normal commercial waste mix for the unit. This is generally approximately 23% flammable liquids (typically waste hydrocarbons), 72 % mixed industrial solid HW and 5% various non-chlorinated chemical wastes. During the initial baseline run, a full set of baseline emission (including PCDD/F) will be undertaken in accordance with the adopted national test burn procedure[34] which will involve period of 24 hours to accommodate the necessary sampling periods (three samples at 8 hour intervals). Additionally this will include PCDD/F analysis of all solid waste residuals and wastewater. The POPs waste will then be introduced at a pre-set feed rate for the target chlorine content for co-disposal with the baseline waste stream and run for similar 24 hour period after steady state operating conditions are established. During in this period, the standard stack sampling plus PCDD/F and the subject waste stream POPs will be done along with PCDD/F Similarly all solid waste residue release points will be sampled, particularly bottom ash, GAC materials and bag filter particulate, as well as waste water for the subject POPs and PCDD/F. Upon conclusion of this the unit

[34] "Regulation on Waste Incineration" No, 2772, October. 6, 2010

system will continue with the baseline waste stream. Once a steady state is reached, the process will be repeated with the other POPs waste stream. The order these will likely be first the POPs pesticide which will be fed in the solid waste feed system and the second would be PCB liquid using the PCB feed system. The target chlorine content for the HCH waste stream will be 1.22% with a feed rate of approximately 70 kg/hour. For the PCB waste stream the target chlorine content is presently envisioned as 3.23% and a feed rate of 20 kg/hour. Depending on results these may be adjusted upwards to test ultimate capacity limitations. The overall cost of the test burn is estimated to be US$967,000 with the GEF contribution being US$100,000 for laboratory services and independent data analysis. The enterprise contribution covers all other costs associated with the test burn including loss of business due to the interruption involved.

- *Output/Activity 1.3.3 – Supporting public consultation:* Discussions with local officials, İZAYDAŞ, and the municipality owning the facility have all identified that there are concerns respecting the potential to introduce POPs wastes at the facility. At the same time there is strong local recognition that this heavily industrialized region is a major source of such wastes and should assume responsibility for its environmentally sound management. This activity will focus on ensuring that a high level of public consultation and awareness exists as this initiative proceeds in a transparent manner. GEF funds will support this along with those of the enterprise.

- *Output/Activity 1.3.4 – Test burns at MESS[35]:* As noted in Section I, MESS are in the process the developing a modern HTI unit in the Kütahya/EGE region, a development that adds much needed overall hazardous waste destruction infrastructure to service Turkey's rapid industrialization. This involves a significant overall investment (currently estimated to be at least US$132 million for the actual incineration facility within an overall investment of US$164 million) of which a conservative estimated of US$10,500,000 is considered incremental in terms of additions to ensure the facility has a broad capability to handle chemical and particularly chlorinated waste streams such as POPs. These incremental investments to allow chlorine feed rates offering high utility in processing such waste streams involve: i) segregated storage and waste handling infrastructure; ii) enhanced post combustion chamber design to maximize resident time and temperature; and iii) enlarged and enhanced APC systems (duplicate bag houses, expanded wet scrubber and dedicated dioxin filter (GAC)). The role of GEF involvement will be to support a test burn program on POPs wastes, like PCBs and POPs pesticides during the facilities qualification and regulatory approval stage. The scope of this work will be essentially the same as described above for İZAYDAŞ with a comparable amount of co-financing for the test burn provided by MESS (US$450,000).

- *Output/Activity 1.3.5 – Supporting public consultation:* This activity parallels that described above for the MESS development respecting ensuring a well informed and consulting public.

[35]This activity and any government co-finance or GEF finance expenditure for MESS will be realized and kept in the Project Document with condition that Environmental Impact Assessment is approved by the Ministry of Environment and Urbanization.

Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles (GEF finance - US$1,700,000; co-finance - US$13,224,648)

The general objective of this Component is to support the longer term management of PCBs in Turkey recognizing the ultimate national obligation under the SC to eliminate PCBs in use by 2015 and have them destroyed by 2028. To this end, Component 2 is designed with: i) three primarily TA oriented Outcomes directed to regulatory strengthening, identification of remaining PCBs for management, specifically targeting as yet unaddressed cross contaminated transformers , and development of a national PCB phase out plan; and ii) two investment oriented outcomes intended to develop and demonstrate the physical capacity to cost effectively manage cross contaminated transformers as part of the national phase out plan implementation. These are described in more detail below. Component 2 is co-financed by the firms of the power generation and distribution sector (Bedas, Etimaden, Igdas, Sedas) as well as by manufacturing industries (Turk Sugar Factories) which are large electric consumers and hence manage large numbers of electric equipment containing dielectric oil, which may be potentially contaminated by PCBs.

Outcome 2.1-Implementation of national PCB regulation: In Turkey, a PCB regulation, compliant to the Stockholm Convention and inspired to the EU PCB directive is already in place. However, the implementation of this regulation is still at a relatively low level for a number of factors, including lacking monitoring and enforcement capacity, and lacking of clear guidance to the existing regulation. It will be supported by US$80,000 GEF funds and US$20,000 in-kind from MoEU. The objective of this Outcome is to address these gaps as achieved by means of the following activities and outputs:

- *Output/.Activity 2.1.1- Technical annex and guidance documents applicable to the existing PCB regulation developed and implemented:* A technical guidance document, detailing formal requirements and technical aspects for the management of PCB contaminated equipment will be developed and disseminated, with the substantial involvement of local enforcement authorities and potential PCB owners.
- *Output/Activity 2.1.2- Capacity of the relevant authority for monitoring, measuring and reporting the implementation of the existing PCB regulation enhanced:* Training involving 50 operational and regulatory staff and professionals on dielectric oil sampling, analysis, labelling and reporting, with focus on technical, strategic and socio-economic impacts for the electric sector will be delivered.

Outcome 2.2.- Systematic approach for the analytical determination of PCB in electrical equipment, labelling and inventory: This effort expands the initial effort carried out during the PPG stage, by identifying a significant number of cross-contaminated PCB equipment, either online or offline for better quantification of this issue. This outcome will be achieved by the following activities and outputs with all co-financing coming from potential holders of PCB contaminated equipment:

- *Output/Activity 2.2.1- Training on PCB equipment identification and labelling:* Technical staff from the electrical sectors will be trained on the identification and labelling of equipment either based on PCBs or potentially cross contaminated with PCBs. The training anticipated to

involve at least 50 people will also include maintenance recommendations to avoid cross contamination of transformers.

- *Output/Activity 2.2.2 - Sampling and analysis of at least 8,000 transformers in-use or stored for maintenance for checking their contamination by PCBs.* At least 8,000 transformers, suspected of being PCB contaminated, will be sampled. Based on available information on testing results in the country to date and frequency of PCB contaminated transformers in other countries, it is expected that at least 400 transformers contaminated by PCBs will be identified and sufficient data on probable total amounts and distribution can be obtained. In the course of this activity enterprises will be instructed on the regular use of screening test kits and verification analytical practice for use on a routine basis during routine maintenance and inspection work, thus providing a wider and ongoing sample for statistical analysis in estimating the scale and distribution of cross contamination
- *Output/Activity 2.2.3: Update of the existing PCB inventory and identification of PCB containing equipment from 50 to 500 ppm and greater than 500 ppm as required by the SC:* In addition to being compliant with the Stockholm Convention requirements on PCB, the PCB inventory has three main purposes: traceability, management, and emergency response. Traceability, because PCB equipment have to be identified and tracked during their residual lifetime to make sure that they will be properly managed and decontaminated or disposed of ensuring the destruction of PCBs as required by the SC; management, because an up-to-date database containing the relevant information (size, power, location, role in the network, age, PCB content) on PCB contaminated transformers represent a strategic asset – both for the country and enterprises - for designing a sustainable PCB management plan which take into account financial needs, logistic, disposal or decontamination technology, energy demand; and thirdly emergency response because it is essential to know, in case of accident (fire, flood, earthquake) whether or not a PCB contaminated equipment is involved, to adopt the necessary and urgent countermeasures. As at the MoEU a database for PCB equipment, not yet containing information on PCB containing equipment, is already available, the project will fill this database with the information gathered during the implementation of Output 2.2.2 and upgrade the functionality of this database, as necessary, to ensure its compliance with the above purposes.

Outcome 2.3- Development and adoption of national PCB equipment treatment, phase out and retirement plan: For the manufacturing and the power generation industry, transformers are expensive and strategic asset. Therefore, to treat or phase out PCB contaminated equipment in compliance with the national regulation and the Stockholm Convention requires a sound planning, based on technical and economic consideration with time and financial committment related to targets culminating their phase out by 2025 and elimination by 2028. The options to be considered will be the treatment (by means of chemical de-halogenation) of PCB contaminated transformers or their dismantling, with recovery of scrap metal (copper, iron, aluminium) after proper decontamination and disposal of highly contaminated oil. The choice of option involves a complex analysis on a case by case basis ultimately justifying a business decision. This outcome will be achieved by means of a consultative approach with the industry and the government: and will encompass the following activities and outputs with in-kind co-financing from the MoEU:

Output/.Activity 2.3.1- Consultation with the main stakeholders from the power generation and distribution sector and large electricity consumers to identify PCB management plan priorities and develop the PCB management plan. The consultation will be carried out through interviews,

questionnaires and site surveys. Questionnaire forms will be therefore developed under this activity. A workshop addressed at introducing the consultation objectives, and to disseminate questionnaires will be held. The consultation will include a follow up by means of e-mail exchange and telephone interviews with all the stakeholders contacted. Based on the result of the consultation and of the updating of the existing PCB inventory, a national PCB management plan will be developed. The national plan will include the specific PCB management plans for the largest potential PCB owners (electric production and distribution companies and large industries with large electricity consumption) and more generally major industrial sectors. The national plan will provide the amount of electric equipment (transformers, capacitors) to be phased out or decontaminated by year; classification of these equipment by PCB concentration range and age; estimated PCB management plan cost by year, region and stakeholders; recommendation on the most suitable technologies, all phased to allow a realistic schedule to meet SC compliance requirements.

- *Output/Activity 2.3.2 - Promotion of adoption and development of an implementation strategy for the PCB management plan:* A strategy for the implementation of the PCB management plan will be drafted. That will include draft regulation for the adoption, enforcement and monitoring of the management plan, and proposal for the financial sources aimed at sustaining the PCB management plan.

Outcome 2.4.- Improvement of storage and maintenance of cross contaminated PCB equipment: This outcome will group activities aimed at strengthening the country's capacity in term of identification, labelling, managing and treating PCB contaminated equipment with a concentration of PCBs exceeding the regulatory limit of 50 ppm, which is currently in use and which is planned for treatment / disposal in the upcoming years. Standards and guidance documents mainly intended for facilitating owners of PCB contaminated equipment will be developed with co-financing provided by holders of the subject equipment.

- *Output/.Activity 2.4.1: Standards and Guidance Documents prepared for prioritizing, maintenance, handling and storage of PCB contaminated equipment in use or under maintenance.:* The following guidance documents will be developed:
    - Guidance document on prioritizing PCB containing equipment based on their residual operational life, use and PCB concentration: This guidance document will address specific methodologies for helping PCB owners in deciding which PCB containing equipment need to be prioritized for disposal or treatment, based on suitable treatment technologies, PCB concentration, intensity of use and risk-related considerations.
    - Guidance for operating, maintenance, handling and storage of PCB contaminated equipment: This guidance is intended to provide owners of equipment containing PCB with instructions aimed at preventing risk for the environment and the operators, and to prevent cross-contamination of equipment with PCB in the course of their operational life.
- *Output/.Activity 2.4.2 - Adoption of physical or operational measures for preventing release of PCB or human exposure to PCB from equipment on-line, in use or stored:* Based on the Guidance developed in the previous sections, containment measures, emergency plans, procedures for handling and maintenance of transformers will be implemented in the places

where these equipment are currently located as necessary to prevent accident and minimize risk deriving from PCB contaminated transformers which are currently in use or under maintenance.

Outcome 2.5 - Verification of decontamination technology for PCB contaminated transformers remaining in service and its pilot demonstration: The applicability of de-halogenation or other chemical technologies for the decontamination of electrical equipment, (destroying PCBs without harming the functionality of that equipment) depends on a few key and interrelated factors, like the concentration level of PCBs in the dielectric oil and the remaining lifetime of the equipment. In addition, local constraints (technological cost and availability, cost of off-line time for equipment to be decontaminated) play a significant role. This outcome will be achieved by activities and outputs encompassing both desk analysis and technology demonstration, as follows with co-financing provided by private sector:

- *Output/.Activity 2.5.1- Verification of technological options for the treatment of on-line or stored transformers for maintenance:* Site-specific and generally applicable technology cost, constraints and benefit will be assessed. A feasibility study will be conducted for the adoption of technologies for the chemical destruction of PCB, to be used for mineral dielectric oil contaminated by PCBs. The feasibility study will encompass considerations related to the PCB concentration, completeness of chemical reaction for PCB destruction, equipment pre-treatment prerequisite (e.g. need for having the equipment off line and / or drained versus continuous and online processes) operational and investment costs, generation of hazardous waste, etc.

- *Output/.Activity 2.5.2- Selection, procurement and testing of equipment for the treatment of PCB contaminated transformers:* A technology for decontamination of PCB contaminated oil and electrical equipment will be procured and tested. A proof of performance test protocol will be drafted and implemented. Testing of the technology will encompass measurement of DE and DRE for the destruction of PCBs, process reliability and disposal cost, resource consumption, waste generation, measurement of the release of pollutants in the environment (air, water). UNIDO has specific experience in projects related to the decontamination of PCB containing equipment using sodium based de-halogenation (either metallic sodium or Na-Poliethylenglicole reagent) for the chemical destruction of PCBs. A large de-halogenation facility has been successfully established in the Philippines, where it is currently operating bringing the concentration of PCB in the oil down to the Philippine regulatory level of 2ppm. In Mongolia, a Na-PEG mobile facility, capable to operate without the need to dismantle contaminated transformers, is currently treating 1,000 tons of PCB contaminated material. A similar facility is being used in Macedonia, with the aim to treat 150 tons of PCB contaminated equipment.

- *Output/.Activity 2.5.3- Pilot demonstration of the treatment of PCB contaminated equipment:* At least 500 tons of PCB contaminated equipment involving between 30 and 150 units depending on their size will be treated using the technology procured under Output/Activity 2.5.2 which being a de-halogenation technology will be suitable to destroy PCB in dielectric oil with a level of contamination up to 10,000 ppm. Reporting of technology demonstration will include both technical and management parameters to facilitate the replication and scaling up of the technology. It may be anticipated that the de-halogenation technologies to be demonstrated will be either based on metallic-sodium dispersion processes (variation of the Wurtz-Fittig reaction) or on variant of the A-PEG reagent process, although other technologies

may be surveyed. This will include an emerging electron-beam technology which UNIDO is currently partnering on development of with IAEA. There are many commercial – scale facilities for PCB de-halogenation available, and the choices among technology depends mainly on the local availability of reagents, on the possibility to destroy PCBs whilst the transformers are online, on the time required for the reaction (being A-PEG reagents usually slower than metallic sodium), and on the different hazards posed by the reagents (metallic Na being more hazardous than A-PEG technologies). Considering that the demonstration will have to provide data for the sustainable treatment of PCB contaminated transformers in the upcoming year, relevant data to be gathered will include: operational cost (including energy consumption, manpower, cost of reagents as a function of PCB concentration, reaction time), reliability (maximum continuous operation time without failure, type of ordinary and extraordinary maintenance operations), destruction efficiency and stoichiometric efficiency. This information will allow a better understanding of the sustainability of these technologies for treatment of PCB contaminated transformers as a function of PCB concentration and residual operational life of the equipment.

Component 3: Unintended POPs Release Reduction (GEF finance – US$2,000,000; co-finance - US$20,870,000)

The overall objective of this component is to define, evaluate and implement on a demonstration basis, a range of options to minimize the generation and the environmental releases of the unintentionally produced POPs (U-POPs) listed in Part I of Annex C of the Stockholm Convention on POPs, specifically PCDD/F, PCBs and HCB, from the iron and steel industry in Turkey which according to the NIP and the results of the completed UNIDO NIP Update Project (2014) is amongst the highest contributors to the PCDD/F emissions to air. Additionally it will support this with targeted TA aimed at achieving long term progressive U-POPs release reduction in the country and the knowledge base needed to monitor this reduction. These objectives are of great relevance given the relative importance of these sectors in term of U-POPs emission and would lead to significant global environmental benefits.

From the technological point of view, the Component also has an objective to enable Turkey move towards widespread utilization of best available techniques (BAT) and best environmental practices (BEP) in the iron and steel sector so as to ensure the reduction of U-POPs emissions according to the requirement of the Stockholm Convention.

From the point of implementation strategy, the Component will also make an important contribution to the promotion of mechanisms which can increase awareness and education about U-POPs, to the development, support and strengthen of technical capabilities in processes, technique and practices that avoid the formation and release of such chemicals in the iron and steel sector, and to provide the basis for the development of further research and monitoring programs, in co-operation with the national authorities that have primary responsibility for the implementation of the Stockholm Convention.

Outcome 3.1: Determination and verification on enterprise level of source and technology specific PCDD/F emissions. Activities leading to this Outcome have two purposes: i) to better clarify the current status of BAT/BEP adoption in the priority U-POPs emitting sectors identified in the NIP

and the results of the completed UNIDO NIP Update Project (2014) and on this basis, and ii) to derive current emission factors for each technology.

Addressing U-POPs release reduction through implementation of BAT/BEP has been one of the priority POPs issues identified in the NIP. According to the results of the completed UNIDO NIP Update Project (2014) NIP, the ferrous and non-ferrous metal industry is responsible for the majority of the emissions to air comprising 50% of the total emissions to air and approximately 12% of the estimated total PCDD/F emissions.

The types of measures that may be promoted or required as BAT to reduce or eliminate the release of Annex C chemicals can be categorized as follows:

- shifting to alternative processes;
- primary measures that prevent the formulation of chemicals listed in Annex C; and
- secondary measures that control and reduce the release of those chemicals.

Source categories by which PCDD/Fs, HCB and PCBs are unintentionally formed and released are given in Part II and Part III of Annex C of the SC and include large point sources (such as waste incinerators and sinter plants) as well as small sources (such as residential combustion sources and crematoria).

Guidelines on BAT and provisional guidance on BEP relevant to Article 5 and Annex C of the SC are available for the source categories included in Part II and Part III of Annex C of the SC.

Currently in Turkey there is not any legal obligation for the industry to be BAT compliant. The draft Regulation on Integrated Permitting (covering Chapter I and Chapter II of the EU's Industrial Emissions Directive (2010/75/EU) the so-called IPPC Directive) which requires permits to be based on BAT has been produced by a recent EU Twinning Project on IPPC (finalized in 2013). However, the drafted Regulation is not in force yet. In addition to the preparation of the draft Regulation on Integrated Permitting, this EU Twinning Project also produced

(i) national sectoral BAT guidelines for selected industrial sectors (iron and steel, textile, refineries, coal and lignite burning large combustion plants) and (ii) guidance on integrated permitting for both the operators and the Ministry experts. Following the EU Twinning Project, an EU TA Project on IPPC (finalized in 2014) carried out surveys to capture the installations that fall under the IPPC and produced a regulatory impact assessment report for IPPC compliance. The GEF project's introduction provided direction for this parallel EU work as it was implemented and with having now established the regulatory basis for IPPC and BAT/BEP implementation the GEF project is providing key factual and sector specific support key to implementation. Having these EU projects where the legal basis is set, sector specific studies capturing the status of BAT/BEP compliance have not been carried out on installation basis. Therefore, this outcome will complement the EU Projects on IPPC providing sector specific analysis on BAT/BEP compliance in priority sectors with PCDD/F emissions.

PCDD/F emissions were regulated as "very dangerous substances" for the first time in 2004 under the Regulation on Control of Industrial Air Pollution. Since then, this regulation has gone through several amendments and the current version of the Regulation on Control of Industrial Air Pollution (Official Journal No: 27277, Date: 03.07.2009) sets an emission limit value of 0.1 ng/Nm^3 for PCDD/F emissions and requires all relevant measures to be taken in order to meet this limit value. Besides PCDD/Fs, this regulation also sets an emission limit value of 0.1 ng/Nm^3 for PCBs, polybromated dibenzodioxins, polybromated dibenzofurans, polyhalogenated dibenzodioxins and polyhalogenated dibenzofurans. In some circumstances, the

PCDD/F emission limit value set in the Regulation on Control of Industrial Air Pollution could be beyond BAT levels.

The first U-POPs inventory for PCDD/F developed in the NIP was carried out applying the UNEP Chemical Standard Tool Kit. The 2006 inventory was updated with new data in 2010. An updated inventory study using the latest version of the UNEP Tool Kit and attempting to account for other POPs has been conducted within the NIP Update Project (2014) completed by UNIDO.

The results will be integrated by sampling and analysis of PCDD/Fs in at least one plant for each priority sector, for a minimum number of 3 plants with the aim of deriving the actual emission factors for the priority sectors. The results of the study will provide a very important feedback for the possible revision of the current PCDD/F emission limit values set in the Regulation on Control of Industrial Air Pollution. Due to the complexity of high volume sampling at industrial sources for the determination of PCDD/F, the derivation of emission factor will be in any case supported by a careful determination of the characteristic of feeding raw materials, cross check with existing emission factors from the literature, and correlation with other contaminants (for instance, dust) and process parameters. As a minimum, emission factors for the following technologies will be evaluated based on both sampling and analysis of PCDD/F, correlation with related contaminants, and technology considerations.

At the time of project preparation, participation of the Iron and Steel sector (sintering plant) has been secured by specific agreements including allocation of co-financing investment, partnership and confidentiality conditions. Specific support to this activity has been committed by I&S sector in terms of:

1. Personnel dedicated to activities related to U-POPs sampling and monitoring during preparation, conduction, and resetting of standard operating condition after sampling;
2. Temporary or permanent installation of equipment or modification of structures for ensuring PCDD/F sampling (i.e. sampling platforms, probe hosing, tubing, lifting equipment, etc.); and,
3. Costs associated to process control, delivery, preparation and analysis of raw material to be used during PCDD/F monitoring, production losses, etc.

Industries from other sectors (non-ferrous metal and other priority sectors) although declaring their interest, were not able to ratify an agreement due to current uncertainties in their investments plans. Therefore, for the industrial sectors which will join after project submission, a specific financial mechanism based on eligibility criteria and partnership conditions will be established. A confidentiality agreement aimed at preventing disclosure of industry's sensitive information will be signed, and monitoring results will be formally considered as outcomes of experimental trials. After evaluation of the eligibility criteria, partnership with eligible industries will be established on a "first come first served" basis. The co-finance under this outcome is thus the contribution from the participating private sector companies.

- *Output/.Activity 3.1.1 Determination of current PCDD/F emission factor – Iron and steel industry (sintering plants) and/or Electric Arc Furnace (EAF) Steel Making Plants) non-ferrous metal industry (copper, aluminium and zinc production) and other priority sectors*. The survey results of the UNIDO NIP Update Project (2014) revealed that the ferrous and non-ferrous metal industry is responsible for 50% of the total PCDD/F emissions to air with iron and steel industry leading in this category. Integrated steel plants are known to have higher energy consumptions and higher specific CO_2 emissions compared to the electric arc furnace steel making technology. The iron and steel industry is one of the strategic sectors in Turkey

which is subject to compliance with key applicable EU Environmental Acquis Directives – the Industrial Emissions Directive (2010/75/EU) being one of the most important ones. This fact is a major driving force for sectoral reform and transformation requiring significant investments in both the short- and long-term. Under this activity, PCDD/F emissions will be measured at the stack of sintering plants in controlled conditions, e.g. in conditions where the operational status of the plant have been accurately measured in terms of amount of material fed to the process, amount of sinter produced, feature of the input material, process temperature, etc. The measures at the stack will be repeated at least 3 times for 2 different sinter plants (Isdemir and Kardemir Integrated Steel Plants). In each plant, at least 3 samples at the stack will be taken in the same operational condition to determine the statistical variability of the sampling. Internationally accepted methods for fume sampling at the stack and PCDD/F determination will be adopted. The mass of PCDD/F emitted will be correlated with input and output streams to derive the emission factors.

The same activity will be carried out for the non-ferrous metal industry (copper, aluminium and zinc production) and other priority sectors. The measures at the stack will be repeated at least 3 times for 3 different plants from the target sectors (copper, aluminium and zinc production and other priority sectors). In each plant, at least 3 samples at the stack will be taken in the same operational condition to determine the statistical variability of the sampling. Internationally accepted methods for fume sampling at the stack and PCDD/F determination will be adopted. The mass of PCDD/F emitted will be correlated with input and output streams to derive the emission factors.

At the time of project preparation, participation of the Iron and Steel sector (sintering plant) has been secured by specific agreements including allocation of co-financing investment, partnership and confidentiality conditions, whilst industries from other sectors (non-ferrous metal and other priority sectors) although declared their interest, were not able to ratify an agreement due to current uncertainties in their investments plans. Therefore, for the industrial sectors which will join after project submission, a specific financial mechanism based on eligibility criteria and partnership conditions will be established. A confidentiality agreement aimed at preventing disclosure of industry's sensitive information will be signed, and monitoring results will be formally considered as outcomes of experimental trials. After evaluation of the eligibility criteria, partnership with eligible industries will be established on a "first come first served" basis.

- *Output/.Activity 3.1.2 Training on PCDD/F sampling and analysis at industrial stacks.* The sampling and analytical determination of PCDD/F at the stack of industrial plants will be taken as an opportunity to deliver a specific training on the matter. The training will include both a theoretical session, where all the specific issue of sampling and analysis will be introduced (isokinetic sampling, positioning of sampling probe, configuration of sampling trains, sampling preservation, and pre-treatment, analytical methodologies, QA/QC) and by allowing a number of at least 10 trainee to participate in sampling and analysis of PCDD/F in the course of the project. The previous sampling and analysis activities will be therefore arranged not only as a service activity, but as a demonstration activity aimed at raising capacity of local technical staff on this complex matter.

Outcome 3.2: Provision of training and technical assistance on BAT/BEP for priority industrial sectors. Experience on other U-POPs reduction projects[36] revealed that there are two sensitive areas which need to be strengthened to obtain reliable estimates and measurement of U-POPs emission: i) the use of proper technological considerations in applying emission factors models; and ii) a good understanding of sampling methodologies (with special reference to high flow or high temperature conditions). Therefore, training will be provided in these 2 main areas, focusing on identified priority sectors (iron and steel, non-ferrous metal, other sectors) and their technological configuration in Turkey. Co-financing for this outcome is provided by MoEU (in-kind).

- *Output/.Activity 3.2.1 Training delivered on U-POPs inventory, sampling and analysis:* The training of 50 professionals will encompass the use of proper emission factor, based on UNEP toolkit or other sources and the knowledge of industrial processes; and practical training on sampling of exhaust gas from industrial sources (high volume and isokinetic sampling) and analytical methods for U-POPs.

- *Output/.Activity 3.2.2 Training delivered on BAT/BEPs in 10 priority industrial sectors*. The EU Twinning Project on IPPC (finalized in 2013) produced national sectoral BAT guidelines for selected industrial sectors (iron and steel, textile, refineries, coal and lignite burning large combustion plants). The EU TA Project on Implementation of the POPs Regulation (project started in 2013) carried out a "training of trainers" activity for BAT/BEP introducing the concept without focusing on specific BAT discussions for the priority industrial sectors. As a follow up, the GEF project will provide training on the most updated knowledge on BAT and BEP for the 10 priority sectors including iron and steel industry (sinter plants and EAF plants), non-ferrous metal industry (copper, aluminium, zinc etc.) and other sectors in Turkey as identified by the NIP and the UNIDO NIP Update Project (2014), based on the EU JRC-IPPC and SC BAT/BEP will be delivered to at least 50 professionals coming from public and industrial sectors, NGOs, and universities.

Outcome 3.3: Development of a national U-POPs release reduction plan. On the basis of the results from Outcome 3.2 above, a national release reduction plan for the priority technologies will be developed. The plan will include a regulatory gap analysis and a proposal for amending the national regulation with secondary level legislation or guidance for the specific sectors, and the identification of technological intervention, business plan and timeframe for the priority areas. A strategic environmental assessment of the proposed plan will be carried out. The following activities will be carried out to achieve this output using co-financing provided as an in-kind contribution (US$100,000) by MoEU:

- *Output/.Activity 3.3.1 Assessment of the regulatory gaps with reference to SC requirement and EU-IPPC regulation and proposed amendments*: Currently in Turkey there is not any legal obligation for the industry to be BAT compliant. The draft Regulation on Integrated Permitting (covering Chapter I and Chapter II of the EU's Industrial Emissions Directive (2010/75/EU) the so-called IPPC Directive) which requires permits to be based on BAT has been produced

[36] GEF 3732 (UNIDO) Demonstration of BAT and BEP in Fossil Fuel-fired Utility and Industrial Boilers in Response to the Stockholm Convention on POPs

by a recent EU Twinning Project on IPPC (finalized in 2013). However, the drafted Regulation is not in force yet. In addition to the preparation of the draft Regulation on Integrated Permitting, this EU Twinning Project also produced (i) national sectoral BAT guidelines for selected industrial sectors (iron and steel, textile, refineries, coal and lignite burning large combustion plants) and (ii) guidance on integrated permitting for both the operators and the Ministry experts. Following the EU Twinning Project, an EU TA Project on IPPC (finalized in 2014) carried out surveys to capture the installations that fall under the IPPC and produced a regulatory impact assessment report for IPPC compliance.

This activity will complement the EU study providing feedback on sector specific BAT/BEP compliance for priority sectors with PCDD/F emissions. In addition, the analysis of the expected development of the regulation in the field will be carried out, including consultation of the authorities in charge and of the main stakeholders. Based on the above, amendments and proposals to the existing draft regulation will be provided.

- *Output/.Activity 3.3.2 Identification of areas with the highest priorities and cost/effectiveness in term of U-POPs reduction*. Based on the results of the updated PCDD/F inventory of the UNIDO NIP Update Project (2014) , the knowledge of industrial processes in the country, and on considerations on the environmental and health effect, a strategic analysis aimed at identifying industrial processes with the largest potential of U-POPs reduction will be conducted. Estimates of the achievable U-POPs reduction for priority sectors will be also carried out.
- *Output/.Activity 3.3.3 Development of the national U-POPs release reduction plan with risk-based and cost/effectiveness priorities*. The updated emission inventory database and the identification of priority areas of intervention will constitute the basis for the development of a national U-POPs release reduction plan, which will have the objective to ensure a consistent reduction of U-POPs within a time-span of 5 years. The national U-POPs release reduction plan will be officially adopted in support or integration of existing pollution reduction strategies in the country.

Outcome 3.4: Demonstration of BAT/BEP in industrial priority source categories: Addressing U-POPs release reduction through implementation of BAT/BEP has been one of the priority POPs issues identified in the NIP. According to the UNIDO NIP Update Project (2014), the ferrous and non-ferrous metal industry is responsible for the majority of the emissions to air comprising 50% of the total emissions to air and approximately 12% of the estimated total PCDD/F emissions. BAT and/or BEP will be demonstrated in priority sectors as identified in NIP and the results of the completed UNIDO NIP Update Project (2014) with the general purpose to show their effectiveness and their cost. The demonstration will follow an experimental design, based on the thorough characterisation of operational conditions, emission sampling and analysis for both the "business as usual" and BAT/BEP conditions. BAT/BEP effectiveness will be however measured not only on the basis of U-POPs analytical results, but also on the basis of other parameters, like process temperature, dust emissions, chlorine content of the relevant streams, energy and water consumption, combustion efficiency indicators (CO, O2, PAH), and, obviously, operating costs. In case the investment cost exceed resources available for the installation of BAT equipment, the comparisons will be carried out among plants equipped with BAT against non-BAT plants. At the time of project preparation, participation of the Iron and Steel sector with demonstration of BAT/BEP for sintering plant has been secured by specific agreements including allocation of co-

financing investment, partnership and confidentiality conditions, whilst industries from other sectors (non-ferrous metals and other priority sectors) although declared their interest, were not able to ratify an agreement due to current uncertainties in their investment plans. Therefore, for the industrial sectors which will join after project approval, a specific financial mechanism based on eligibility criteria and partnership conditions will be established. More specifically, the criteria would be: i.) proposed partnership of industries under this outcome will be aimed at demonstrating technologies bringing a substantial reduction of U-POPs (PCDD/Fs) release in the environment; ii). the overall amount of incremental investment and in kind co-financing related to the adoption of BAT/BEP provided by the industries should be not less than 4 times the amount of grant requested to demonstrate the U-POP reduction technology; iii) the industries will provide the necessary support, access to the plants, and availability of data to ensure monitoring of operational conditions and sampling and analysis activities. In addition to the above, a confidentiality agreement aimed at preventing disclosure of industry's sensitive information will be signed, and monitoring results will be formally considered as outcomes of experimental trials. After evaluation of the eligibility criteria, partnership with eligible industries will be established on a "first come first served" basis. Currently, the substantial declared co-financing has been secured from Kardemir and Isdemir Integrated Steel Plants with additional co-financing with other partners anticipated.

- *Output/.Activity 3.4.1. Demonstration and assessment of BAT/BEP in the iron and steel sector (sintering plants and electric arc furnace) and non-ferrous metals sector (copper, zinc, aluminium).* Demonstration of sintering plant BAT/BEP will mostly encompass the assessment and upgrading related to operational conditions, the effect of residue recycling, and the effectiveness of various APCS in term of reduction of dust and U-POPs. The demonstration will be carried out at the Kardemir and Isdemir Integrated Steel Plant, and will encompass:
    - Primary Measures: i) Stable and consistent operation of the sinter strand (by means of automated system recently bought); ii) Continuous parameter monitoring; iii) Recirculation of off-gases; iv) Feed material selection; v) Feed material preparation; and vi) Urea injection:
    - Secondary Measures: PCDD/F Removal techniques by means of: i) adsorption/absorption and high-efficiency de-dusting; ii) fine wet scrubbing for removal of particulate matter from sinter off-gases, and iii) hooding of sinter strand.

    To assess the global environmental benefit, the potential for the reduction of PCDD/F emissions is assessed roughly for the Kardemir and Isdemir ISPs. Currently in Kardemir ISP, the 2 sinter machines have electro-filters for dust removal. For the recently installed 3rd sinter machine, a SO_2 removal desulphurization plant will be built and planned to be finished in 2015. The investment not only includes SO_2 removal but also dust removal system. The investment will also include the necessary infrastructure investment for the future removal of heavy metals and PCDD/Fs via activated carbon. Depending on the efficiency and effectiveness of this equipment, the same will be installed in the other 2 sinter machines by 2017. The operational cost is currently not known. However, it is known that each sinter machine will use 80 tonnes/day $Ca(OH)_2$. For $Ca(OH)_2$, a lime factory will be built within Kardemir ISP where the CaO produced at the plant will be used as the raw material.

    Based on the above, it is expected that the reduction in PCDD/F will be proportional with the estimates provided in the UNEP toolkit from a situation between class 1 (20µgTeq/T) and class

2 (5µgTeq/T) and a final emission factor in the order of 0.3µgTeq/T. Therefore, assuming a conservative reduction factor of 10 µgTeq/T, and considering that the sintering lines at Kardemir ISP process currently around 900,000 t of sinter /year, the demonstration could achieve a direct reduction of 9gTeQ PCDD/F year, and a potential of 18gTeq/year. In addition, a similar demonstration will be carried out at the Isdemir facility, which has currently a sinter production of 4.15 million metric tons/year, with therefore a potential PCDD/F emission reduction of 41.5 gTeq/year.

The potential for reduction of PCDD/F at EAF plant furnace is very high. Considering that Turkey processed more than half of the overall amount of scrap exported from the EU in 2011, before the implementation of the EU scrap regulation 333/2011, the demonstration of the effectiveness of a better scrap quality on the emission of PCDD/F is of strategic relevance. Demonstration of BAT/BEP in the iron and steel will encompass the assessment for a better segregation of scrap material fed to the furnace, as well – for instance – evaluation of alternative processes like direct smelting or direct reduction. Large EAF furnaces usually have very high volumetric flow rate, in the order of hundred thousand to millions of Nm^3/hr, and may have PCDD/F concentration at the stack of some ngTEq/Nm^3, depending on the quality of the processed scrap and on type of APCS. Even limited reduction of PCDD/F concentration may therefore result in a significant reduction of the mass flow rate of PCDD/F released in the environment. This demonstration is also aimed at understanding the environmental benefits and the incremental cost of implementation of the quality of scrap procedure envisaged by the EU regulation 333/2011 on the scrap metal.

Demonstration of BAT/BEP in the non-ferrous metals sector will mainly include production from secondary raw materials. The main environmental issues associated with the production of non-ferrous metals from secondary raw materials are related to the off-gases from the various furnaces and transfers that contain dust, metals and in some process steps, acid gases. There is also the potential for the formation of dioxins due to the presence of small amounts of chlorine in the secondary raw materials. Eligible technologies and processes for the demonstration of BAT/BEP under the project will be:

- Upstream processes: quality control of scrap materials; modification of the process to accept range of raw materials; optimisation of mixtures fed to the process, automatic feeding systems to obtain the best feeding mixtures;
- Within processes: process control techniques aimed at measure and maintain optimum parameters such as temperature, pressure, gas components, and other critical process;
- Downstream processes: upgrading of APCs, including installation of filters and afterburners; installation of activated carbon columns; increase of dust removal efficiency, catalytic oxidation.

Component 4: Management Capacity for Contaminated Sites (GEF finance - US$700,000; co-finance - US$6,025,000)

As described above in Section I, Turkey has embarked on an ambitious program that will begin to systematically deal with the contaminated sites issue on a comprehensive basis. This component of the project will link to the implementation of this program and specifically the regulatory

framework being introduced through two principle Outcomes and associated Outputs/Activities as described below

Based on the above, the Component has been designed with two components. Outcome 4.1 will provide technical assistance with an institutional partner focus at the national and regional level. It is aimed at providing key technical support in some specific areas involved in the testing and fine tuning of detailed program's implementation, namely operationalizing the key systems provided for by the national regulations, development of site clean-up financing mechanisms; supporting awareness and participation in the program, and training support in several key subject areas where capacity strengthening is identified as being required. All of this would be supported by in-kind MoEU co-financing and BOSCH parallel co-financin.. Outcome 4.2 will involve a combination of general support related to site assessment, clean up design and technology studies administered through MoEU during implementation of its regulations and more targeted specific pilot clean up initiatives that will serve to demonstrate the application of the program for a variety of priority POPs and chemical contaminate situations which can potentially be replicated. The scope of GEF support will be focused on the site specific demonstration activities on selected priority sites under agreements with site holders, with resources directed to the required front end detailed site assessment/clean up design work as well as initiation of clean-up work, largely through immediate containment and monitoring measures. The parallel private resources and committed from BOSCH and MOEU's in kind contributions would provide substantive support for more the general site assessment, technology study, supervision and technical clearance activities being undertaken directly through MoEU's implementation process associated with the new regulations.

Outcome 4.1 Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation": This overall Outcome is directed to providing targeted technical assistance to MoEU and the regional level authorities in various detailed aspects of implementing the three basic component steps and associated information systems that form the basis for a national contaminated sites management program as envisioned in the regulatory framework now in place and being activated. The component parts of this program cover identification/registration, evaluation, and clean up action/monitoring that are to be managed using three corresponding management information systems now being activated, namely the: Contaminated Sites Identification and Registration System (CSIRS), Contaminated Sites Evaluation System (CSES), and Contaminated Sites Clean-Up System (CSCS). Assistance provided by the Project as desribed below will focus on provision of international experience in the practicalities of implementing these aspects of the such programs, ensuring public and site owner awareness of the issue and implications of the newly applied regulations, developing various financing modelatities to overcome barriers to actual action, and providing training in key technical areas. More specifically the sequencing of the GEF assistance will be coordinated with the GEF support providing immediate access to resources timed with the initial roll out of regulatory implementation,

- *Output/Activity 4.1.1: Technical support provided for implementation and administration of the three primary systems under the regulation and supporting policy - Contaminated Sites Identification and Registration System (CSIRS), Contaminated Sites Evaluation System (CSES), and Contaminated Sites Clean-Up System (CSCS):* This activity will focus on the practical implementation of the three systems at the national and most importantly the regional

levels. This includes ensuring that the data acquisition being initiated in 2014-15 through survey declarations from a large number of industrial sectors and within them, a broad range of public and private enterprises, is efficiently handled with the appropriate decision making and actions. More specifically, this will involve developing an effective capacity for requesting declarations through the required "Activity Preknowledge Form", validating its contents in a first stage site assessment as documented in an audit report and formally registering sites according to its classification of being non-contaminated, contaminated, or requiring further assessment to classify. Recognizing the large volume and variety of data that will be generated, effective data management support will be targeted. Additionally support will be provided in developing and implementing capability to effectively prioritize sites which will based on using a full life cycle/cost benefit analysis inclusive of risk based health and environmental impacts. In practice it is recognized that this will require a significant amount of practical judgement and experience development in tailoring the actual work and reporting to the seriousness of the issue and economic constraints that inevitably apply. The overall Project will provide guidance in undertaking this both with front end GEF support.

- *Output/Activity 4.1.2: Technical support provided in developing mechanisms for financing contaminated site clean-up under the regulations:* Traditionally, a major barrier to addressing contaminated sites is the ability to assemble the necessary financial resources to pay for the required actions in a timely manner. This applies at each stage of the process including the assessment and design stages but most importantly for actual clean up and post clean-up remediation care and monitoring provisions. It also involves the investigation of appropriate legal and economic instruments that will serve as drivers for structuring such financing. In this regard, substantial international experience has developed in various options that may be applicable in a range of situations which could potentially be adapted to the issue in Turkey. The conventionally used options such as, the development of sectoral or broadly based environmental levies to create a publicly administered fund, direct budget capitalization of such funds, having equitable but stringent liability provisions in law requiring responsible parties to directly fund clean ups, and various public private partnership (PPP) models involving land re-development will be assessed within the current situation in Turkey and recommendations will be made in a technical report. Again the GEF support will allow both the rapid initiation of this work and capacity to sustain it through the development of tool kit of financial instruments and regulatory tools to address the issues listed above. Additionally a macro financial analysis will be also carried out to assess the financial needs for the land reclamation and clean up activities.

- *Output/Activity 4.1.3: Stakeholder awareness and consultation support in regulation implementation delivered:* A key aspect of successfully implementing these regulations will be developing and sustaining a high level of awareness and acceptance in the industrial community, particularly holders of potentially contaminated sites. These parties need to understand and accept the implications that these regulations may have to their businesses and development plans. This also extends to related stakeholders such as financial institutions, local government development agencies, insurers and ultimately the potentially impacted neighbouring public, all of whom can be expected to have a major influence on how the issue is dealt with. To effectively implement the regulations, anawareness raising program including consultation with relevant stakeholders to ensure its practical implementability. Likewise there needs to be continual consultative follow up through the life cycle of dealing with such sites.

The Project utilizing GEF financing will support MoEU and regional authority in this integration with international experience and presentation materials.

- *Output/Activity 4.1.4: Training program development and delivery for site assessment including application of risk assessment methodologies, for remediation technology demonstration and selection :* The regulations and supporting guidance materials prescribe set methodologies and approaches for site and risk assessment. In order that appropriate human capacity to implement these is available, a training program directed to both private sector service providers and to authority staff is required, including demonstration of how these methodologies and approaches can practically and reasonably be applied in practice, with additional focus on selection and operational aspects of remediation technology options, specifically as applicable to POPs and halogenated chemicals contaminated sites. . The GEF support in this area will be the provision of international experience, particularly related to case studies and similar applications as may be encountered in Turkey. An estimated initial 200 professionals in the listed areas above, from regulatory authorities, site holders and private sector service providers will be trained using GEF funds..

Outcome 4.2: Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation": It has been found in the course of work during the PPG stage that, while a significant number of sites are strongly suspected of having significant POPs and priority chemicals contamination, progress on either undertaking factual initial analytical or risk assessment has been limited and there remains a reluctance for site owners to undertake even this level of preliminary investigation. In the absence of the regulatory framework being implemented the mechanisms for stimulating this are not yet in place. This relatively low level of maturity in addressing the issue is in part associated with traditional conservative fears related to "knowing" what liabilities they may be responsible for, and more immediately a lack of awareness of the implications associated with pending implementation of the new regulatory framework in 2014-15. Effectively a "wait and see" attitude prevails with holders of such sites identified as potential candidates for GEF assistance, something that is also partly a result of traditional avoidance of command and control type regulation. All of this makes it premature to fully develop specific demonstrations projects as originally intended under this Outcome with GEF support during the PPG stage. During the PPG phase preliminary discussion were conducted with BOSCH and the company committed to partner up within this component; however, this partnership will not include the site clean-up activity. Notwithstanding this, several potential priority site holders have engaged in preliminary discussions, and at this point have agreed in principle to participation once the regulatory declaration process is initiated. To this end, UNDP is continuing informal technical and commercial discussions on the scope of assistance, particularly under Output 4.2.2 such that accelerated arrangements for demonstration projects can proceed upon Project approval.

This output s structured with two outputs/activities.

- *Output/Activity 4.2.1 – Initial site assessment, clean up design and technology option analysis for prioritized regulatory action:* This activity is essentially facilitate the technical analysis for a potential contaminated sites that can be accessed under MoEU direction to support targeted investigations of selected sites based on the mandatory declaration returns from initial

implementation of the Soil Pollution Control and Point-Source-Contaminated Sites Regulation. From the defined potential sites, 10 sites will be selected according to suspicion on containing contamination with POPs and will be further assessed with technical analysis and 3 of them will be used as pilot area in Activity 4.2.2. It would support MoEU ordered more detailed site assessment, including risk assessment and then clean up design and remediation technology option studies as required. The site assessment study will be applied according to national regulations.

- *Output/Activity 4.2.2 – Undertaking demonstration contaminated sites clean – ups us.:*
  The intention would be that a minimum of three priority sites be undertaken during the Project period which will represent a variety of contaminated site situations in terms of the POPs or other chemical pollutants involved, the type of sector involved and the type of business model that might be applied in organizing and financing the clean-up The GEF resources will be directed to funding part of the detailed site assessment (including risk assessment) and design of the clean-up operations themselves inclusive of technology selection and demonstration as may be required. Additionally, the GEF support would be provided as appropriate to initial clean up actions, particularly related to containment to eliminate immediate release threats and monitoring of critical pollutant release. However, in all cases the substantive costs of clean up would be assumed by the site holders that will be selected based on the site assessment developed in activity 4.2.1., To this end a pre-condition of participation and disbursement of any GEF funds from the facility would be that a minimum level of co-financing from the site holders and/or responsible parties would be at a 4 to 1 ratio relative to GEF funding. This arrangement with specific financial commitments and suitable guarantees along with details of scope and responsibilities would be formalized in a legal agreement between the site holder(s) and MoEU.

  The selection of specific sites and beneficaries would be based on a selection criteria weighting the following major factors:

  - Substantive POPs or other priority chemical pollutant contamination with significant demonstrated potential health, environmental impacts;
  - Willingness to voluntarily pursue clean-up activities and agreement in principle for providing the 4:1 minimum co-financing level
  - Socio-economic benefits derived from site clean-up in terms of new development and land use planning
  - Pubic demand and support for undertaking clean up, including direct participation and support of local and regional governments.
  - Value as replicable demonstration of a particular type of contaminated site clean-up and/or financing modality
  - Full compliance with the information submission requirements specified by the applicable regulatory framework.

Based on the current implementation schedule planned by MoEU for initial implementation of the contaminated sites regulatory framework, it is anticipated that the selection of priority sites can be made during the inception phase of the project (first half of 2015).

Component 5: Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management (GEF finance - US$460,000; co-finance - US$13,868,000)

This Component encompasses the final stage of Turkey's efforts to be become fully compliant with the SC from an institutional and regulatory perspective. It is based on a strategy that adopts a path of harmonization of the national legal and regulatory environmental framework for sound chemicals management with that of the EU. The development of the current GEF project, starting in 2011, with its emphasis on dealing with POPs and chemical waste legacies underpins this strategy and substantively facilitates its effectiveness. This is accomplished through operationalizing the evolving advanced legal and regulatory framework and strengthened practical technical capacity required to support it, all allowing achievement of primary SC compliance on the ground. These technical capacity aspects generally reflect the focus of GEF resources as reflected in the other components of the project detailed above. This Component builds on a number of completed or completing EU IPA program projects listed in section "Current Situation with respect to POPs and the Stockholm Convention" and serves as synergistic support for a number of similarly substantive EU IPA I program projects.. More related linkages and gaps are listed to the respective activities below. The latter are generally considered as project co-financing. These EU projects along with national resources are generally focused on the institutional, legal and regulatory aspects and the more limited GEF resources are being used to tie these together and facilitate Turkey's anticipated status as a leader regionally in the area of POPs and chemicals management both as a provider of expertise.

Outcome 5.1: Legislative framework updated and adopted consistent with Convention obligations:
This overall Outcome reflects the primary POPs and SC related institutional and regulatory development process being undertaken and as such is primarily based on the recently developed and implemented technical assistance projects being provided under the EU IPA I program. The EU support within the overall Outcome focuses on detailed legislative and regulatory harmonization and on completing the accession process for the Rotterdam Convention while GEF funding will facilitate targeted capacity assessment work related to planning and development of the required infrastructure.

- *Output/Activity 5.1.1 Harmonization of POPs related legislation and regulation with current SC obligations and relevant EU Directives*: This activity is principally funded by the EU IPA I project entitled "Technical Assistance for Implementation of the Persistent Organic Pollutants Regulation" recently implemented and the additional national co-financing. It scope covers developing a series of specific regulatory measures within Turkey's current hazardous waste management regulatory and related contaminated site and chemicals management framework that will allow both full compliance with the SC (including dealing with new POPs) and with requirements of all relevant EC directives and practice. Policy review and recommendation will be carried out and necessary documents to be prepared to be used as reference and guidance for decision makers.

- *Output/Activity 5.1.2 Implementation of Rotterdam Convention supported through enabling activities.*Similar to Output 5.1.1, this Output is also primarily through an EU IPA program project entitled "Implementation of Export and Import of Dangerous Chemicals Regulation" being planned for implementation through 2015, along with national budget contributions.

This will facilitate the final accession and effective implementation in practice of the Rotterdam Convention as well as support the control measures in the form of bans, restrictions and Prior Informed Consent (PIC) required for compliance with the SC, particularly in respect to new POPs. GEF contribution will be made to facilitate participation of Turkish Designated National Authority (DNA), in regional POPs and chemicals waste management activities.

- *Output/Activity 5.1.3 Identify national capacities and potential cooperation for POPs and chemicals management and develop a national POPs and chemicals waste management capacity needs assessment.: this output will support the assessment of the national POPs distruction technical capacities and determination of POPs management infrastructure. These activities will result in two technical reports.* The national capacity in terms of human resoruces and technical infrastructure for management and monitoring of pops will be assessed and determined for a better planning of the usage of the national resources on management of persistent organic pollutants. After determination of the national status of POPs management the potential cooperation areas and topics will be determined for Turkey's future cooperation and technical assistance delivery. These activities will be reported separately in order to be submitted to policy makers.

Outcome 5.2: Strengthened technical capacity including operational POPs monitoring, supporting expanded analytical capability, and planning related research and development capability: As Turkey moves to the status of a developed country it recognizes the need for a well-developed environmental monitoring capability supported by appropriate and broadly based analytical capacity and appropriate research and development programs related to chemicals and specifically POPs. This Outcome supports this with targeted GEF resources providing relevant international experience and facilitating linkages to global information sharing initiatives that further and promote the use of national resources and assets in these areas.

- *Output/Activity 5.2.1 Operational POPs monitoring and participation in the Global POPs network facilitated*: Turkey is embarking on the development and operation of comprehensive ambient monitoring capability for a wide range of pollutants including all major chemicals and a complete range of annexed POPs. This currently focuses on water as detailed above with programs operative or planned for all major coastal and river water basins. While somewhat fragmented data bases are being developed for air, soil and sediment particularly for various POPs chemicals, largely through programs funded through academic institutions; however, additional effort is needed to strenghten the monitoring activities and data collection with a centralized mechanisms. The focus of GEF support in this area will be facilitation of consolidation of this data and linking it to the Global POPs Monitoring Network. This activity will be completed in coordination with the Ministry of Forestry and Water Affairs.

- *Output/Activity 5.2.2 Qualification undertaken with additional laboratories for regulatory purposes related to POPS and contaminated sites activities:* While Turkey has developed extensive fully accedited laboratory capability related to POPs and chemicals analysis, past policy has limited the acceptance of results for regulatory decision making and official monitoring programs to that operated by the national laboratories of TUBITAK. The much expanded requirements now foreseen as the level of regulation and with programs such as that being initiated for contaminated sites and expanded monitoring programs suggests this kind of

service provider base needs to be substantially expanded, particularly with adoption of more internationally accepted practices using competitive private sector capability. This output combines Laboratories and GEF resources to qualify a network of such laboratories and associated field sampling and monitoring capability and to provide appropriate training for staff. MoEU have prequalified 5 commercial laboratories (4 private sector, 1 non-profit foundation) all of whom are fully accredited and who have expressed interest in this program. These are listed below with a brief summary of their current capabilities. Overall they provide national coverage with capability geographically located in all regions and particular capability in the heavily populated north east. GEF resources will support a program of familiarization and training for personal in the laboratories on the analytical and monitoring requirements needed to support regulatory enforcement and national monitoring programs as well as a program of comparative analysis. For their part, enterprises will contribute both direct co-financing for expanded service capability and equipment as well as in-kind contributions through staff and laboratory time. This is considered both in-kind and direct cash co-financing for the project where associated with POPs and chemicals analysis and monitoring.

- CINAR Environmental Laboratory (http://www.cinarlab.com.tr/?page_id=101&lang=en): CINAR is an Ankara based full service laboratory offering air, water and soil analysis as well as field air and water monitoring services. Current capability covers a wide range of OCP including the main POPs pesticides, PCBs and other common organic contaminants. Current investment plans for the expanded participation envisioned under the above regulatory programs are based on expanded utilization of existing equipment and infrastructure with some upgrading but expansion of staff and training. A total incremental investment of US$233,000 is forecast and would generally be classed as in-kind.

- Artek Engineering Environmental Measurement and Consulting Services (http://www.artekcevre.com.tr/environmental_measurements.html): Artek is a full service environmental services and occupational health and safety firm based in Istanbul but with branch office and laboratories in Adana in the south and Samsum on the Black Sea coast. Analysis for air, water and soil covers POPs pesticides, PCBs, PCDD/F and PFOS although sub-contracting abroad is required in some cases. Investment plans in response to expanded regulatory market requirements total US$586,000 including US$375 in direct equipment invest in expanded PCDD/F analytical capability.

- SGS Environmental services (www.sgs.com.tr): SGS is a Swiss based global firm with consulting and laboratory operations around the world. In Turkey it is headquarter in Istanbul and 5 laboratories and 2 regional offices around the country. The laboratories specialize in various sector niche markets such as geology, food, residue research, cement, agro-products and chemical products. The current in-country capability relevant here is for POPs pesticides, noting that SGS has a global centre of excellence in Belgium for POPs and would use this facility primarily. Investment plans in response to the current expansion of POPs related regulatory activity is limited to an in-kind investment in staff, training and support infrastructure estimated to be US$350,000

- Düzen Norwest Environmental Laboratory (www.duzennorwest.com.tr): This private firm operates a well-equipped general analytical services laboratory in Ankara undertaking

environment and food related analysis nationally, as well as a team of field sampling specialists. It is currently nationally accredited and accepted for client based work by MoEU. It has only identified modest investment requirements related to the process of qualification and in-kind training for participation in the GEF supported program of expanding to provide direct regulatory analytical services.

- NEN Engineering Laboratory Services (http://www.nenmuhendislik.com): This is a relatively new full service environmental services private company in Ankara offering full multi-media scope in analytical and field support services on a fully accredited basis. The company has committed incremental investment to qualifying as a supplier of direct services to regulatory authorities in the amount of US$245,000 of which US$155,000 is direct cash investment and US$90,000 is in-kind investment in staff, support infrastructure, certification and training which is considered co-financing.

- Izcev Environmental Laboratory (http://www.izcev.com/default.asp?L=TR&mid=151): This is a well-established environmental services laboratory located in Izmir that is owned by an independent foundation. It provides services to the environmental services sector and a variety of industrial sectors in this heavily industrialized region. It currently has sufficient capacity to participate in the GEF supported qualification program with MoEU to provide direct regulatory services without incremental investment that would constitute co-financing.

Outcome 5.3 Development and implementation of modern tools for a national sound chemicals management framework: This Outcome as originally contemplated in the PIF is now being covered by two significant EU IPA program projects on POPs and PIC that were developed by the MoEU Chemicals Department recognizing the synergy that would exist with the conceptual design of the GEF project. In finalizing the project design it was recognized that this synergy could be enhanced by merging the original companion Outcome related to chemical management awareness and training with the institutionally oriented technical assistance. The now proposed Outcome uses the EU support for the detailed development of the a chemical profile initiative, a national PRTR system, and implementation of the EU REACH regulatory framework with GEF resources being used to support the linked awareness and training support for these initiatives. This ensures that the Outcome remains appropriate within the overall GEF Project framework and linkages to other outcomes within Component 5 and particularly in the case of PRTR to IPPC implementation initiatives in Component 3. Ensuring coordination and synergy with the directly supported GEF activities is substantively facilitated by the overall supervision of this Project within the Chemicals Management Department who also act as the focal point for these EU projects.

- *Output/Activity 5.3.1 Delivered training on sound chemicals management to 200 institutional and industry professionals and stakeholders:* This activity will direct to targeted training of institutional and industry stakeholders in sound chemicals management and specifically the framework being developed in Turkey. As chemicals management legislations and implementation procedures in the country changed with recent developments such as new Turkish REACH regulation and registration system established with this regulation and also

POPs regulation will be published in 2016 the representatives of the industry should be informed by dissemination activities. GEF support will be directed to international inputs with direct and in-kind co-financing provided by the government and other stakeholders.

- *Output/Activity 5.3.2 Delivered general chemicals management awareness materials to the general public in the form of information products and public events:* This activity will be directed to enhancing awarenes related to sound chemicals management in the general population including educational institutions, civil society and the general public. GEF support will be matched by direct MoEU contribution.

Component 6: Project Monitoring and Evaluation (GEF finance - US$100,000; co-finance - US$388,000)

The component aims at monitoring and evaluation of results achieved to improve the implementation of the project and disseminate lessons learnt domestically and internationally. The outputs of the component are:

- M&E and adaptive management are applied to provide feedback to the project coordination process to capitalize on the project needs; and
- Lessons learned and best practices are accumulated, summarized and replicated at the country level.

Further details are provided in Section IX, Covering Monitoring Framework and Evaluation.

Non-GEF Baseline Project (Estimated baseline co-financing US$40,840,000)

The theoretical baseline project developed for the incremental cost reasoning (Section VI) is described in the following by Component, Outcome and major applicable baseline activity involved. This is summarized in Table 12. It is based on the assumption that some portion of national and other international co-financing as committed to herein is available but GEF funding is not. The discounting of baseline co-financing availability is applied in recognition that a portion of this is in fact leveraged by the prospect of GEF financing materializing and might otherwise not be available. It is also recognized that what financing that is available, both from national budgets and enterprises, is likely spread over a longer period in the baseline case. Since all of the activities involved directly or indirectly related to the reduction or otherwise of POPs releases spreading out these activities effectively reduces global environmental benefit than would be achieved with GEF funding.

- *Component 1.0 Elimination of Current POPs Stockpiles and Wastes GEF Finance (Estimated baseline Co-financing US$4,925,000 million):*
    - *Outcome 1.1: Elimination and infrastructure removal from remaining POPs pesticide storage sites:* The general baseline for this outcome would essentially be the status quo

with the Merkim site continuing as it now. It would be assumed to remain under the care and custody of a private sector owner that as a best case would continue exercising appropriate due diligence in maintaining the POPs stockpile as secure. However, there would be no guarantee of this recognizing that the upgraded secure status in place since 2011 was effectively stimulated by the prospect of GEF funding or at least the attention created by the GEF project's appearance. However, apart from the estimated US$560,000 investment made in upgrading the condition of the building and eliminating 280 t of the POPs pesticide material made between 2011 and 2013, no additional direct new investment in the elimination of the stockpile would occur in the medium term baseline case, apart from the in-kind Merkim administrative and supervision costs, and potentially some regulatory expenditures. Noting the Merkim PPG investment stimulated by the project related to the determination of limited soil contamination, it might be assumed that some expenditures related to compliance with the new contaminated sites regulation would be made by 2018-19 but these would likely be nominal. Effectively, the substantial additional direct investment in elimination POPs waste and restoration of the site that has been committed as co-financing through the GEF funding leveraging is purely incremental. Overall a baseline estimate of US$850,000 is assigned. Of this, US$580,000 is Merkim direct new expenditures during the PPG stage on the prospect of the GEF project and should also be considered incremental for purposes of co-financing.

- *Outcome 1.2: Elimination of high concentration PCBs and PCB containing equipment stockpiles.:* The project's contribution to the elimination of PCB stockpiles coming available during the project implementation period is essentially entirely incremental. It covers equipment that would be replaced or is being replaced. It is recognized that the country's basic obligation under the SC would theoretically result in the stockpiling and disposal of this equipment by 2025 and 2028 in any event. However, the GEF investment ensures the rapid and accelerated replacement and environmentally sound destruction in a much shorter time frame with associated reduced risk and improved global environmental benefit (GEB). At best in the baseline situation, some equipment might be replaced but remain stockpiled or disposed of without the benefit of international best practice.

- *Outcome 1.3: Qualification of existing and developing national POPs destruction facilities.:* The baseline case for the two HTI facilities involved in this outcome would be their continued operation in one case (IZAYDAS) and pending development in the other (MESS) without any incremental activities or investment directed to qualifying them for chlorinated HW generally and POPs wastes in particular, which the GEF investment leverages. However in both cases, there will be some baseline investment. In practice it is difficult for some specific investments to readily separate the two, although the methodology used and illustrated in Table 11 above described provides the basis for the detailed baseline estimate made for IZAYDAS in the amount of US$4,075,000 (the difference between Enterprise Total Investment and Project Allocation in Table 11). All other costs associated with the work at IZAYDAS, principally the test burn costs are considered entirely associated with the Project and a result of the GEF investment. For MSG, the overall direct capital investment in the HTI facility itself is currently set at $82,000,000. The enterprise advises that the incremental capital investment in this, primarily in high quality materials and more advanced APC systems would be

US$10,500,000. All of this is effectively considered incremental and in the absence of the baseline investment would not exist unless the full lesser capital investment (US$71,500,000) was included which it has not been for purposes of the baseline estimate. Similarly, the test burn where the GEF funding is applied along with enterprise co-financing to qualify the facility for POPs and other chlorinated chemical wastes is by definition entirely incremental.

Component 2.0 Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles (Estimated baseline co-financing – US$60,000): The management of PCB cross contaminated transformers has not been implemented yet by the main Electrical Power companies or large industries met at the PPG stage, the baseline project is therefore simply the continuation of current management of electrical equipment which basically only included disposal of end of life, PCB based transformers as addressed in Component 1.2. The only attributable baseline activities and expenditures linked to management of cross contaminated transformers relates to in kind activities and expenditures by government regulatory authorities related to the operation and maintenance of the database containing PCB contaminated equipment to ensure compliance with the requirement of the Stockholm Convention on PCBs and with the requirement of the Turkish PCB regulation which has been estimated at US$60,000. Effectively all activities undertaken under this project would not otherwise be occurring and are incremental, as is all the co-financing identified except for this small baseline amount.

- *Component 3.0 Unintended POPs Release Reduction (Estimated Baseline co-financing – US$ 150,000 associated with concluding EU-IPA projects and US$24,815,000 from the iron and steel sector)*

For Outcome 3.1, in addition to future activities which will be possibly carried out by the Government on the monitoring of industrial sources (not quantified), the baseline here is mainly related to the data made available under previous monitoring carried out by I&S industries in the year 2011 and 2012, for a value quantified in US$2,800,000. Most of the baseline expenditures are those borne by MoEU as internal cost relate to the coordination of EU IPA relevant projects:

- "Improving Emissions Control", EU IPA Program TR0802.03, 2010-2014
- "Institution Building on Air Quality in The Marmara Region", EU Project TR 0702.07, 2010-2014
- "IPPC-Integrated Pollution Prevention and Control", EU Twinning Project (Spain-Poland-Turkey), Twinning Number TR 08 IB EN 03, 2011-2013
- "IPPC-Integrated Pollution Prevention and Control" EU IPA Program TR0802.04, 2010-2014
- "Control of Industrial Volatile Organic Compound Emissions", EU IPA program, TR2009/0327.01, 2010-2014.

As most of these projects have been recently concluded or will be concluded before project starting, in the absence of the GEF project the future expenditure is related only to follow up or the remaining activities at the time of project implementation, and on the values of available data and reports which would represent a starting point for conducting training (outcome 3.2) and for the U-POPs release reduction plan (outcome 3.3).

For Outcome 3.4, the investments that have been initiated since 2011 based on the activities stimulated by the EU IPA program have been substantial. Since 2010 the Kardemir and İsdemir integrated steel plants invested in BAT/BEP technologies improvement of their air emissions from sinter plants and coke cracking, via APC system and continuous monitoring. For Kardemir, investments in the period 2010-2013 focusing on the removal of particulate matter from sinter off-gasses, a system for the stable and consistent operation of the sinter strand amounted to US$ 8,240,898 while for İsdemir, investments in the same period related to continuous monitoring systems, removing of particulate matter from sinter plants #1 and #2, retrofitting of sinter plant #1, and improvement of the dust abatement system from the coke plant reached US$ 49,224,000. These figures, which include the US$ 2,800,000 disbursed for monitoring and counted as baseline for outcome 3.1, have not been considered in the co-financing calculation reported in Table 10. Based on the analysis of document provided by Isdemir and Kardemir, it is assumed that around 40% of the above is related to project activities for an overall amount of US$ 24,865,000.

Similarly, for the co-financing reported in Table 10, calculations have been based on the assumption that 40% of the BAT investment declared for the period 2015-2017 by İsdemir and Kardemir ISPs on sinter plant desulphurization including dust removal and future extension with an activated carbon for heavy metal and PCDD/F removal is related to the future extension of activated carbon for heavy metal and PCDD/F removal[37].

- *Component 4.0 Management Capacity for Contaminated Site**s** (Estimated Baseline co-financing – US$1,900,000)*:

    - *Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"*: The baseline scenario for this outcome is that the contaminated sites regulation adopted in 2010 is implemented by MoEU but a significantly slower rate and largely process and administrative in nature in the absence of GEF funding and the associated additional EU IPA program funding that is now under development. For purposes of assigning a baseline cost to this the in-kind contribution planned by MoEU and counterparts at the regional level in doing this is estimated to be US$50,000. The GEF contribution along with additional matching funding for additional targeted support plus the contemplated EU IPA Program funding is considered fully incremental.

      Outcome 4.2: Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation": At present there has been only very limited investment made or contemplated in actual site assessment or actual clean-up related to contaminated sits has been identified that would be considered a baseline. The only one specifically identified during the PPG stage is the site assessment and technology identification study work undertaken on the Bosch Bursa site which is involves an estimated US$1.8 million investment to date and would not be considered project co-financing but is included in the baseline estimate. Similarly, US$50,000 of in-kind MoEU funding allocated to this outcome under the project is considered baseline. In the absence of the GEF project there would be expenditures

[37] Total co-financing amount for the period 2015-2017 amounts to USD 41,150,000 and USD 17,241,731 for İsdemir and Kardemir respectively.

made in this area with the implementation of the new regulations but an estimation of these is not practical at this time, noting that without GEF and EU IPA II support these would like be spread over a longer period. In summary, costs as reflected in Table 10 are considered incremental.

- *Component 5.0 Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management (Estimated Baseline co-financing – US$5,140,000 million)*:

  - *Outcome 5.1: Legislative framework updated and adopted consistent with Convention obligations:* The baseline scenario for this outcome would ultimately be the same result but likely later and rolled out in a piecemeal fashion in the absence of the GEF funding and the substantive EU IPA funding programs directly targeting harmonization and enhanced import/export controls. The estimated baseline cost is taken as the currently estimated in-kind MoEU expenditures over the period 2014-2018 (US$220,000). Potentially this could be increased by fragmented bilateral assistance that might be attracted to undertake piece meal tasks. Overall, the rate at which this outcome would occur in the baseline case would be largely dictated by the progress Turkey makes in formalizing it relationship with the EU.

  - *Outcome 5.2: Strengthened technical capacity including operational POPs monitoring, supporting analytical capability, and planning related research and development capability*: The baseline scenario for this outcome is essentially to consider that the current program initiatives up to the end of 2014 related to water (US$4,200,000) and no continuation to be undertaken nor addition of other media or efforts to formalize this monitoring in the context of the Global POPs Monitoring Network. Additionally it assumes that the activity in the project associated the expansion of qualified analytical laboratories and monitoring service providers for regulatory recognition and the development of POPs/chemicals based R&D initiative would not occur.

  - *Outcome 5.3 Development and implementation of modern tools for a national sound chemicals management framework:* The baseline scenario related to this outcome assumes that efforts in this area are limited to in-kind internal MoEU initiatives in the general chemicals management without the benefit of the programs now completing related REACH (US$3.4 million) but without the benefit of continuing committed and new planned through the EU IPA Program associated with the companion GEF project. A baseline amount of US$3, 900,000 is estimated.

Table 12: Baseline project and cost estimate (Expected Expenditures during the planned 4-5 year project without GEF funding)

Component/Outcome	Baseline Activity Description	Cost Estimate (US$)	Notes
Component 1: Elimination of Current POPs Stockpiles and Wastes			
Outcome 1.1 - Elimination and infrastructure removal from remaining POPs pesticide storage sites	Packaging, transport and environmentally sound destruction of 238 t and investment in upgrading the building by Merkim (2011-2013)	560,000	Undertaken as a direct result of the GEF project
	Merkim in-kind custody (administrative), maintenance and monitoring costs the	200,000	

Component/Outcome	Baseline Activity Description	Cost Estimate (US$)	Notes
	secured site and POPs stockpile (2010-2018)		
	Preliminary Merkim site assessment expenditures during the PPG stage	20,000	Undertaken as a direct result of the GEF project
	Regulatory costs associated with initial compliance with new contaminated sites regulations	40,000	Costs associated with reporting requirement under the contaminated site regulation to be implemented in this period
	Local and national regulatory authority in-kind supervision costs (2014-2018)	30,000	Assume in-kind costs of US$10,000/year for regulatory oversight.
	Outcome 1.1 Total	**850,000**	
Outcome 1.2: Elimination of high concentration PCBs and PCB contaminated equipment stockpiles	Packaging, transport and environmentally sound destruction of f high concentration PCBs and PCB containing equipment.	-	No baseline costs in the absence of the project
	Outcome 1.2 Total	**-**	
Outcome 1.3: Qualification of existing and developing national POPs destruction facilities	Facility upgrades investment in materials handling, APC and monitoring infrastructure at the Izaydas high temperature incineration facility.	4,075,000	Baseline costs that portion of the investment profile assumed cover the general waste market requirements
	Development investment of the MSG high temperature incineration facility	–	All investment defined under the project incremental.
	Outcome 1.3 Total	**4,075,000**	
	Component 1 Total	**4,925,000**	
Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles			
Outcome 2.1: Implementation of national PCB regulation	Current level of MoEU effort on PCBs	20,000	The established database does not contain yet any information on PCB .
Outcome 2.2: Systematic approach for the analytical determination of PCBs in electrical equipment, labelling and inventory	Current level of MoEU and enterprise effort on sampling and reporting PCB levels in equipment plus measures to label and monitor identified PCB equipment	20,000	Limited baseline activity due to slow enforcement of PCB regulation and limited PCB holder response .
Outcome 2.3: Development and adoption of national PCB equipment treatment, phase out and retirement plan	Current level of MoEU effort on PCBs	20,000	The PCB national strategy does not contain either indication on cross-contamination or a sustainable retirement plan.
Outcome 2.4: Improvement of storage and maintenance of cross contaminated PCB equipmentt	Activities related to developing and demonstrating cross contaminated transformer treatment capacity	0	No activities or actions directed to management of cross contaminated transformers. All investment defined under the project is incremental.
Outcome 2.5: Verification of decontamination technology for PCB contaminated transformers remaining in service and demonstrating it on a pilot basis.			

Component/Outcome	Baseline Activity Description	Cost Estimate (US$)	Notes
	Component 2 Total	**60,000-**	
Component 3: Unintended POPs Release Reduction			
Outcome 3.1: Determination and verification on an enterprise level of source and technology specific U-POPs emissions	I Monitoring activities carried out by enterprises (Kardemir and Isdemir) in the years 2011 and 2012.	2,800,000	Although monitoring expenses occurred in the past (2011 and 2012), these are included here as available data represent an asset which is useful as starting point for project monitoring activities
Outcome 3.2: Provision of training and technical assistance on BAT/BEP for priority industrial sectors	EU IPA I project training / TA delivered under EU cooperation on IPPC. Institution Building on Air Quality in The Marmara Region", EU Project TR 0702.07, 2010-2014 (7.08 million EUR)	50,000	If the GEF support did not exist only limited training partially focused on BAT/BEP would be carried as follow up of the EU cooperation on IPPC.
Outcome 3.3: Development of a national U-POPs release reduction plan	EU IPA I harmonization with EU Directives on IPPC, VOC emissions and LCP along with in-kind supervision by Government.	100,000	If the GEF support did not exist, then the development of national U-POPs reduction plan would not occur. Calculated here is the value of data gathered under EU-IPA which can be used for drafting the reduction plan.
Outcome 3.4: Demonstration of BAT/BEP in industrial priority source categories	Neglecting related investments of sinter plants 2010-2014 (US$123,500,000, there is no baseline investment	21,865,000	This is previous cash investment related to reduction of air particulate emission made by the I&S sector before project starting. This is only partially dedicated to U-POPs reduction and is not considered as co-financing as it occurred before project implementation, however project activities would benefit from this
	Component 3 Total	**24,815,000**	
Component 4:Management Capacity for POPs Contaminated Sites			
Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	Initiating implementation and administration of the program and its component systems and estabhishment of implementation mechanisms at the regional level.	25,000	In-kind MoEU and regional regulatory authority internal expenditures contemplated to be allocated to implementation of the program
	Awarenes and consultation efforts in support of the above as required	25,000	In-kind MoEU and regional regulatory internal expendures for some level of stakeholder/public communication.
Outcome 4.2: : Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-	Funding initial site assessment, clean up design and technology option analysis for prioritized regulatory action	1,850,000	One identified site assessment /remediation technolofy identification investment
	Undertaking demonstration contaminated site clean ups using a pilot	0	No formal site remediation work initiated.

Component/Outcome	Baseline Activity Description	Cost Estimate (US$)	Notes
Contaminated Sites Regulation"	national contaminated sites funding mechanism		
	Component 4 Total	1,900,000	
Component 5: Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management			
Outcome 5.1: Legislative framework updated and adopted consistent with Convention obligations.	Harmonization of POPs related legislation and regulation with current SC obligations and relevent EU Directives.	220,000	Preparatory work prior to initiation of EU and GEF work In-kind internal MoEU expenditures on upgrading regulatory framework. Potential fragmented bilateral support.
	Ratification/accession to the Rotterdan Convention	220,000	Preparatory work for accession to the Convention (2011-2014) In-kind internal MoEU expendities on implementation administration Potential fragmented bilateral support for implementation 2014-2018
Outcome 5.2:Strengthened technical capacity including operational POPs monitoring, supporting analytical capability, and planning related research and development capability	Operational POPs/chemicals monitoring	4,200,000	Current terminating water monitoring programs undertaken by MoFWA/TUBITAK
Outcome 5.3 Development and implementation of modern tools for a national sound chemicals management framework	National chemicals profile and PTPR development and other chemicals management initiaives with supporting training and awarenes activities.	500,000	In-kind internal MoEU expenditures sound chemicals management Potential fragmented bilateral support.Linited support
	Component 5 Total	**5,140,000**	
	Total Baseline Project Costs	**40,840,000**	

Response to GEF and STAP Review Comments

The following provides a direct response to the outstanding points documented in the GEFSEC Review Document dated August 17, 2012 as attached to the February 20, 2013 PIF approval from the GEF CEO.

- *Exact Industry Sectors being targeted for BAT/BEP:* As covered above in the detailed description of Component 3 and whose background profiles are described in Section I, the sectors specifically target by the Project for BAT/BEP utilizing GEF resources are the iron and steel sector and the non-ferrous metals sector. The qualification initiatives in Component 1 applicable to HTI hazardous waste destruction facilities which are now exceeding or are being designed to meet BAT/BEP general performance requirements will also be evaluated through test burns to demonstrate BAT/BEP with respect to environmentally sound POPs destruction using international practice.

- *PCB contamination assessment should be completed in the PPG stage to determine if there is an actual need for an ESM for PCB:*

  As explained in the situation analysis on PCB, in the course of PPG stage, in a joint effort with the UNEP/MAP project transformers were tested for PCB content. More specifically, in the course of the first UNEP mission, out of 28 transformers checked, 7 transformers were found cross-contaminated by PCBs for an overall equipment weight of 22.5 tons; in the second mission, out of 154 transformers checked, 5 were found with a contamination greater than 50 ppm for an overall equipment weight of 11.2 tons. In a subsequent visit to the ETI Mine Facility in Bandırma, Balıkesir, 58 sample were taken, out of which 5 new transformers online (manufactured in 2009) showing cross contamination from 105 to 149 ppm. A certain number of cross contamination cases, below 50 ppm, were also observed. Used oil was collected in an oil tank, where 608 ppm of PCBs was detected. At the Igsaş chemical factory, 9 transformers, of which 8 are still in use, were found cross contaminated by PCBs with concentration ranging from 83ppm to 1506 ppm (weighted average of 942 ppm) and an overall equipment weight of around 86 tons.

  Although these numbers are not enough for any statistical inference, it is evident that the problem of cross contaminated PCB does exist and that this problem will have to be solved in the near future to comply with the Stockholm Convention requirements and with the Turkey regulation on PCBs.[38]

  These results are very much in line with the outcome of PCB inventories in developed countries, were from 10 to 15% of mineral oil transformers have been found contaminated by PCB at a concentration higher than 50 ppm. Although the actual survey numbers are not enough for any statistical inference applicable to the situation in Turkey as yet, it is evident that the problem of cross contaminated PCB does exist. Under the project, an overall number

[38] UNEP/MAP: PCB Inventory in Turkey, November 2013; UNEP/MAP: Mission report Site Visit for Turkey's PCB inventory September 2013

of further 8000 transformers will be tested for PCB contamination with the support of the electrical power sector. This will trigger a systematic approach by the electric sector industries, which, beyond the resources placed by the project, and with a substantial amount of co-financing even in the course of project implementation (see Table 10) will sustain the sampling and analysis of PCB transformers after project closure to completely identify all PCB contaminated equipment well in advance to the SC deadline set for the year 2025.

In the course of the PPG stage, a great effort has been paid to secure the commitment of electric power industry to participate in the project and more specifically to have their equipment tested. A shifting from a very reluctant approach toward an enthusiastic commitment resulting in making available a substantial amount of co-financing for project activities was observed. This was the result of a two-fold raising awareness activity: on one side, the government made clear to the electric sector its willingness to effectively enforce the existing regulation on PCBs which ultimately requires owners of electrical equipment to test their equipment for PCB content and adopt the necessary countermeasure (decontamination or disposal of PCB equipment). On the industry side, the owners of contaminated equipment understood that to not address timely PCB issue would eventually result in a very high liability and financial risk, and now perceive the project as a valuable resource not only to solve the environmental problems related to PCBs but also to established a green business aimed at the ESM management of PCBs. This is reflected in the co-financing commitments obtained from four major enterprises in the sector. In this framework, there is a fair certainty that the plan to test further 8000 transformers for their PCB content during project implementation will be successful.

The nature of the training to be provided to 50 BAT/BEP professionals and 25 legal/regulatory professionals: Descriptions of the training applied in Components 1, 2, 3, 4 and 5 are detailed under the descriptions of the respective training related outputs/activities above.

Training provided for regulatory professional at the national level and regional level will be provided as follows:

- Output/Activity 1.1.5 - Inclusion of at least three (3) regional inspection staff in applied training on the Merkim site covering operational and safeguards training applicable to hazardous waste and contaminated site management including site excavation, packaging and restoration operations, all based on current national and international standards.
- Output/Activity 2.1.2 - Training involving 50 operational regulatory professionals on dielectric oil sampling, analysis, labelling and reporting, with focus on technical, strategic and socio-economic impacts for the electric sector
- Output/Activity 3.3.2 - Training of BAT/BEP professionals in priority sectors
- Output/Activity 4.1.4: Training program on contaminated site assessment including application of risk assessment methodologies integrated with implementation of new national regulations directed to both private sector service providers and to at least 20 regulatory staff, particularly at the regional level.
- Output/Activity 4.1.5 Training program for selection and operational aspects of remediation technology options, specifically as applicable to POPs and halogenated chemicals contaminated sites including at least 10 regulatory authority staff

- Output/Activity 5.3.4 Targeted training of in sound chemicals management and specifically the framework being developed in Turkey, including at least 20 regulatory staff in directly mpacted institutional stakeholder organizations.

- *The type of upgrading of the destruction facilities:* A detailed description of the upgrading undertaken in the Izaydas HTI facility is described under Outcome 1.3 and Output/Activity 1.3.1 inclusive of a detailed list of investments involved, both enterprise and GEF, is provided in Table 12. For the second HTI facility being qualified, namely the new HTI facility being developed by MESS no upgrading per say nor no direct capital investment in facilities using GEF funds are involved. GEF funding is exclusively related to supporting test burn procedures.

With respect to STAP Review comments March 1, 2013, the following addresses the specific points and guidance provided, noting that the UNDP project team has consulted with STAP staff on the issues raised and appreciates the professional guidance and feedback received:

- *Relationship with the GEF FAO Regional Project "Lifecycle Management of Pesticides and Disposal of POPs Pesticides in Central Asia and Turkey"*: During the PPF stage the UNDP project team reviewed available material on this project and consulted with FAO officials and counterpart agencies on its content and potential linkages or possible duplication. The only potential linkage relates to that which may exist between Turkey's pesticide and agrochemical registration system and the overall chemical management initiatives covered under Component 5, specifically those related to the adoption of the EU REACH approach and accession to the Rotterdam Convention. In that regard, both the pesticide registration framework now in place under MoFAL and the adoption of the REACH approach are all based on an EU harmonization approach and have or are being substantively supported by the EU IPA program rather than GEF resources. With respect to obsolete and POPs pesticide stockpiles, substantive inventory work reported in Section I (Situation Analysis) and most recently updated in the above reference Draft NIP Update indicate that such stockpiles are limited to that being addressed exclusively under the current project, namely the Merkim site, plus a small inventory held by MoFAL which they advise will not be addressed by the FAO initiative. As has been indicated, the project will avail itself of any relevant published FAO guidance material as part of the wider body of such guidance material that may be relevant to the operations undertaken in Component 1. In summary no duplication between the projects exists and the UNDP/UNIDO project will through its dissemination activities will share experience with other Isa including FAO.

- *General STAP Guidance on Remediation:* The UNDP project team is fully familiar with the overall general guidance STAP has issued for remediation related GEF projects with members of the project team being contributors to this guidance, involved in the authorship of the recommended GEF STAP guidance document, and in design and supervision of the World Bank and UNDP projects in Belarus and Vietnam referenced in the STAP guidance. During preparation of this project the various points noted in GEF STAP Guidance have been discussed with counterparts and will be utilized throughout the project's implementation.

The GEFSEC review cycle also raised questions regarding the adequacy of co-financing, particularly from the private sector, although in the final review this was not stated as requiring

further specific attention. However, during the PPG, a focused effort has been made to enhance private sector co-financing with considerable success. The project is projected to have an overall co-financing ration of 7.8 to 1. Component 1 has a co-financing ratio of 4.5 to 1 with US$25,334,000 in almost exclusively private sector co-financing. Component 2 has a co-financing ratio of 7.8 to 1 with US$13,225,000 in private sector/utility co-financing. Component 3 has a co-financing ratio of 10.4 to 1 with US$20,870,000 in private sector co-financing. Component 4 has a co-financing ratio of 8.6 to 1 with at least US$1,600,000 in private sector co-financing.

VI. Incremental reasoning and benefits

Incremental reasoning:

The basis for the incremental reasoning supporting the project and GEF funding is provided in the description of the Project Baseline above and as summarized in Table 12. In general the incremental reasoning applicable to the project is based on the GEF intervention acting as a primary catalyst for Turkey's rapid transition to fully developed country status in respect to management of POPs, the other such catalyst being the country's harmonization with EU practice and standards. The GEF project's role and specifically the GEF funding in this synergistic approach is to deal with hard POPs legacy issues and the stimulation of modern, replicable and potentially exportable technical capacity in addressing POPs, and more broadly chemical HW management. The following elaborates specifically on this incremental reasoning by Project component:

- *Component 1.0 Elimination of Current POPs Stockpiles and Wastes:* This Project Component is directed to elimination of a substantial quantity or immediately pending high POPs content stockpile legacies that without GEF financial support and leveraging can be assumed would not otherwise happen in the near to medium term, noting that while known for some time have been without resolution. More specifically, the globally significant large stockpile of POPs pesticides and associated POPs wastes would remain essentially as is, a quantity of PCB stockpiles, albeit only a portion of those potentially accumulating over the coming years. The creation of incremental capability for BAT/BEP environmentally sound destruction of POPs waste at two facilities would otherwise not likely occur with both the support in qualifying such capability and creation of a market for these destruction services within the overall HW management market in Turkey.

- *Component 2.0 Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles:* This component is directed to providing Turkey with legal, regulatory and technical tools and supporting information that will allow the country to ultimately comply with its 2025 and 2028 SC obligations. Recognizing that the country has been working on the side of PCB contaminated equipment (e.g. equipment contaminated at a level exceeding 50 ppm) for almost ten years with only modest progress, in the absence of GEF support, achieving this objective would be at risk. For this reason the resources devoted to this component are considered incremental.

- *Component 3.0 Unintended POPs Release Reduction:* The component is directed to the reduction of U-POPs emissions from priority industrial sources via training and technical assistance on BAT/BEP, improved monitoring of the emissions including sampling and monitoring. Since year 2000, there are numerous studies that have been undertaken to introduce BAT/BEP concept including the preparation of draft regulation on integrated environmental permitting, institutional capacity building at the MoEU and preparation of national BAT guidelines for some sectors. However, industrial scale pilot studies targeting U-POPs emission reductions have not been done yet. Recognizing the importance of know-how and technical assistance on BAT/BEP, in the absence of GEF support, achieving the objective

of U-POPs reduction at priority industrial sectors via BAT/BEP implementation would be at risk. For this reason the resources devoted to this component are considered incremental.

- *Component 4.0 Management Capacity for Contaminated Site*s**:** Turkey has only recently started to develop a systematic and comprehensive approach to the contaminated sites issue, something that was happening independently of the GEF Project. However this has largely been an institutional planning exercise to date. The incremental contribution of the GEF project is to facilitate operationalization of this program through provision of technical tools and guidance on financing mechanisms based on international experience as well as to provide seed funding to initiate key demonstration clean up initiatives, specifically related to POPs and priority chemicals site contamination. In the absence of the GEF support this could potentially occur but in a fragmented less coordinated fashion and likely at much slower pace, without a priority focus on POPs contaminated sites, and without the benefit of the substantial international experience that the GEF and IA supported experience brings.

- *Component 5.0 Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management:* The GEF's contribution to this essentially to supplement and provide a synergetic linkage between the GEF investment oriented project and the substantial EU IPA program institutionally oriented funding now starting delivery, noting that the initiation of the GEF Project with its legacy elimination focus has been a substantial stimulus to the parallel development and delivery of this program. The modest GEF contributions within this component's overall framework serve to link the regulatory and legal initiatives with training and awareness tools as well providing a practical connection to their realization through planning and development of physical POPs and chemical management facilities and service provider capability in the private sector. Additionally it supports serious initiation of Turkey's role as a donor and expertise provider in the region. All of this is directly incremental.

Global Environmental Benefits (GEB):

GEB derived from the project and specifically that derived incrementally from the GEF's investment and the co-financing that it leverages is summarized in Table 13 below. These primarily fall under the GEF-5 Chemicals Focal Area Objective (CHEM-1: Phase out POPs and Reduce POPs Releases). Within that objective and its linkage to Article 5 and 6 of the Stockholm Convention, these include directly quantifiable GEBs in the form of POPs stockpiles and waste eliminated and POPs releases prevented, as captured in GEF-5 strategy Outcomes 1.3 (POPs releases to the environment reduced), and 1.4 (POPs waste prevented, managed and disposed of, and contaminated sites managed in an environmentally sound manner). These also directly track to the three of the main GEF-5 Chemicals Strategy Outcome Indicators, namely Indicator 1.3.1 (Amount of un-intentionally produced POPs releases avoided or reduced from industrial and non-industrial sectors; measured in grams TEQ against baseline as recorded through the POPs tracking tool), Indicator 1.4.1 (Amount of PCBs and PCB-related wastes disposed of, or decontaminated; measured in tons as recorded in the POPs tracking tool), and Indicator 1.4.2 (Amount of obsolete pesticides, including POPs, disposed of in an environmentally sound manner; measured in tons). Additionaly, less quantifable GEB are derived from the project through the planning and process TA with each component that will substantively move Turkey into the status of a fully Convention compliant developed country with respect to this issue as well as support its role as a significant

donor and supporter of expertise regionally and globally. In terms of the GEF-5 Chemicals Strategy these related to Outcome 1.5 (Country capacity built to effectively phase out and reduce releases of POPs), and Indicator 1.5.1 (Progress in developing and implementing a legislative and regulatory framework for environmentally sound management of POPs, and for the sound management of chemicals in general, as recorded in the POPs tracking tool).

Table 13: Summary of Project Global Environmental Benefits

Component/Outcome	Global Environmental Benefit	GEF-5 Chem-1/Stockholm Convention Linkage
Component 1:Elimination of Current POPs Stockpiles and Waste		
Outcome 1.1: Elimination and infrastructure removal from remaining POPs pesticide storage sites	• Elimination of 2,400 t of POPs pesticides, 400t of POPs pesticide waste, and 30 t of obsolete pesticides • Secure disposal of 200 m3 of POPs contaminated soil	GEF Chem-1 Outcome 1.4 GEF Chem-1 Indicator 1.4.2 SC Article 6
	• 20 national staff trained in POPs stockpile and waste management available for future requirements	GEF Chem-1 Outcome 1.5
Outcome 1.2: Elimination of high concentration PCBs and PCB contaminated equipment stockpiles	• Elimination of at least 350 t of PCB based equipment inclusive of an estimated 115 t of PCBs.	GEF Chem-1 Outcome 1.4 GEF Chem-1 Indicator 1.4.1 SC Article 6
Outcome 1.3: Qualification of existing and developing national POPs destruction facilities.	• National qualified capacity to eliminate future POPs stockpiles and wastes including PCBs and POPs pesticides generated nationally and potentially regionally (Residual PCB based equipment stockpiles and requiring phase out and elimination estimated to be at least 250 t) • Upgraded emission control investment to reduce U-POPs release	GEF Chem-1 Outcome 1.4 GEF Chem-1 Indicator 1.4.1 GEF Chem-1 Outcome 1.5 SC Article 5 SC Article 6
Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles		
Outcome 2.1 Implementation of national PCB regulation	Guidance and national capacity for enforcement of PCB regulation established.	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5.1 SC Annex A part II
Outcome 2.2: Systematic approach for the analytical determination of PCBs in electrical equipment, labelling and inventory	Capacity development, representative sampling data base for PCB cross contamination and basis for comprehensive overall national PCB inventory	GEF Chem-1 Outcome 1.4 Indicator 1.4.1 GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5.1 SC Article 6 SC Annex A part II
Outcome 2.3 Development and adoption of national PCB equipment treatment, phase out and retirement plan	Sustainable national PCB management plan, including identification, labelling, phase out and retirement established.	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5.1 SC Annex A part II
Outcome 2.4. Improvement of storage and maintenance of cross contaminated PCB equipment	Sustainable national PCB management plan, including identification, labelling, phase out and retirement established.	GEF Chem-1 Outcome 1.5 SC Annex A part II
Outcome 2.5: Verification of decontamination technology for PCB contaminated transformers remaining in service and its pilot demonstration	• Decontamination and continued use elimination of 200 t of PCB and PCB contaminated transformers compliant to the definition of PCB under SC and directive 96/59 EC and its subsequent modification and integration.	GEF Chem-1 Outcome 1.4 Indicator 1.4.1 SC Article 5 SC Article 6 SC Annex A part II
	• Qualified national capacity to decontaminate PCB and PCB contaminated equipment compliant to the definition of PCB under SC and	GEF Chem-1 Outcome 1.4 GEF Chem-1 Indicator 1.4.2 GEF Chem-1 Outcome 1.5 SC Article 5

Component/Outcome	Global Environmental Benefit	GEF-5 Chem-1/Stockholm Convention Linkage
	directive 96/59 EC and its subsequent modification and integration.	SC Article 6 SC Annex A part II
Component3: Unintended POPs Release Reduction		
Outcome 3.1: Determination and verification on and enterprise level of source and technology specific U-POPs emissions.	Determination of national PCDD/F emission factors for the priority sectors (sinter plants, EAF, non-ferrous metals and other priority sectors)	GEF Chem-1 Outcome 1.5 SC Article 5
Outcome 3.2: Provision of training and technical assistance on BAT/BEP for priority industrial sectors	50 national staff trained on BAT/BEP (from priority sectors, governmental institutions)	GEF Chem-1 Outcome 1.5 SC Article 5
Outcome 3.3: Development of a national U-POPs release reduction plan.	National U-POPs release reduction plan developed targeting the U-POPs reduction from priority sectors with risk based and cost-effectiveness priorities	GEF Chem-1 Outcome 1.5 SC Article 5
Outcome 3.4: Demonstration of BAT/BEP in industrial priority source categories	Reduction in PCDD/F emissions of sinter plants, EAF plants and the non-ferrous metals sector by 5 TEQ/a	GEF Chem-1 Outcome 1.3 GEF Chem-1 Indicator 1.3.1 SC Article 5
Component 4: Management Capacity for POPs Contaminated Sites		
Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	• Implemented national regulatory framework to require management of contaminated sites specifically POPs contaminated sites • Basis for effective financial instruments to allow remediation of elimination of POPs contaminated sites and elimination of release risk associated with POPs contaminants • Trained national experts in key contaminated sites management disciplines facilitating efficient POPs release reduction.	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5.1
Outcome 4.2: Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	• Site assessment and clean up design under regulatory direction on 4 priority sites • POPs containment/release prevention and/or elimination on three demonstration sites	GEF Chem-1 Outcome 1.4 SC Article 5 SC Article 6
	• Creation of replicable capability for undertaking future POPs contaminated site clean-ups	GEF Chem-1 Outcome 1.5 SC Article 5 SC Article 6
Component 5: Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management		
Outcome 5.1: Legislative framework updated and adopted consistent with Convention obligations adopted.	• Fully developed and up to date POPs legal and regulatory framework in place and implemented to EU standards	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5.1 SC Article 15
Outcome 5.2: Strengthened technical capacity including operational POPs monitoring, supporting analytical capability, and planning related research and development capability	• National technical analytical, monitoring and R&D capacity supporting national, regional and potentially global initiatives in reduction elimination of POPs release and related chemicals management activities. • Active participation and data contributions to the global POPs monitoring network	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5 1 SC Article 11 SC Article 15
Outcome 5.3 Development and implementation of modern tools for a	• Modern sound chemicals management capability consistent with the global integrated approach to	GEF Chem-1 Outcome 1.5 GEF Chem-1 Indicator 1.5 1

Component/Outcome	Global Environmental Benefit	GEF-5 Chem-1/Stockholm Convention Linkage
national sound chemicals management framework	sound chemical management and promotion of green chemistry.	

Other GEBs from the project are the increase in capacity in this region and by extension globally in the management of POPs waste and more generally in HW and contaminated sites management within a sound chemicals management framework. This includes i) demonstrating a practical mix of in-country and export POPs waste management options to achieve the most cost effective solutions; and ii) expanding and sustaining technical capability in key disciplines and service areas such as risk assessment, HW management practices, and analytical capability, and POPs monitoring capability.

National Development Benefits:

The national development benefits essentially track those reflected above, namely elimination of all or some significant national environmental legacies, institutional strengthening of national environmental management capacity and development of supporting technical capability all related to HW, contaminated sites and U-POPs. This includes the development of new and upgraded a national HW management infrastructure in the form of environmentally sound POPs destruction and contaminated PCB equipment decontamination capability, industrial process modernization and expanded human resource capability in the field through training opportunities provided. The addition of this general infrastructure capacity is critical needed to sustain the country's industrial development. Overall, this brings the strategic development benefit of moving Turkey to a level on a par with fully developed countries and particularly its EU neighbours in terms of modern environmental management capability in relation to POPs, HW generally, contaminated sites management and control of U-POPs releases. Economically, the project also advances the countries potential as an exporter of environmental goods and services, particularly in the Eastern Mediterranean, Black Sea Regions as well as the Middle East and Central Asia.

VII. Replicability and Sustainability

The Project generally supports the progressive development of POPs legacy management, expedited SC compliance and more generally HW, contaminated sites and general sound chemicals management capability in a large rapidly industrializing country, which is approaching graduation to a developed country status and that of a potentially significant donor.

As such, the project has a number of features that will serve as examples and provide direct implementation experience in a number of areas that can support replication, both nationally and elsewhere, particularly in the context of assisting other upper middle income countries undergoing rapid industrialization and development in following this path. These include:

- Applying an approach to POPs stockpiles, waste and contaminated site elimination based on prioritizing the cost effectiveness, risk mitigation, and global environmental benefit as a primary criteria in incrementally capturing, securing and ultimately eliminating the POPs waste and associated risk.

- Ensuring an appropriate mix of developing national capability and utilizing established, international capability to obtain the most cost effective, sustainable and practically achievable results.
- Planning and developing national POPs and general HW management infrastructure incrementally based on market needs and being competitive internationally.
- Development of synergies with other international programs built around a primary economic driver of harmonizing environmental standards and practice with major trading partners.
- Exploiting and building on national capability and capacity to provide a sustainable expertise core and physical capability in critical areas such as risk assessment, HW management practices, contaminated site assessment/containment/monitoring, and development of optimized analytical support capability in the private sector.
- Integrating of proactive public consultation and awareness activities into the planning and implementation of sensitive HW and contaminated sites projects.
- Special care will be paid to ensuring that the training, especially the ones under component 2 and 3, will be delivered to industries and stakeholders which will have to manage the PCB equipment (component 2) and industrial facilities (component 3) well beyond project closure. More specifically, component 2 training will be addressed, on the government side (waste department of MoEU) at ensuring the proper labelling, monitoring and tracking of PCB containing devices; whilst on the industry side (mostly the electric sector) at creating capacity in the ordinary and emergency management of PCB equipment, and in safest and more cost effective strategies and technologies for the decontamination of PCB containing equipment. Training under component 3 will be mainly addressed to industrial partners, including industry associations to ensure that the experience gathered in the adoption of BAT/BEP may be effectively replicated in other industrial facilities.

The overall project design with its linkages and synergy with EU programing and target support in key areas, where national policies and priorities are established and committed to, underpins the Project's basic sustainability. In terms of the specific POPs legacy elimination sustainability is provided by achievement of the respective quantified outcomes, all supported by substantial counterpart co-financing commitments. The inclusion of market and business case tests for the infrastructure and technology investment support related to POPs and HW management facility development and upgrading underpins their sustainability. In all cases, sustainability is further enhanced by the provision of key targeted technical assistance and awareness activities. Finally, the sustainability of outcomes related to institutional and regulatory related initiatives is primarily based on Government commitment which itself is supported by its co-financing commitments and the overall policy motivation associated with further formalizing its relationship with the EU.

VIII. Management Arrangements

The project will be executed by Ministry of Environment and Urbanism (MoEU) (Local Executing Agencies and Beneficiary in GEF terminology) following UNDP guidelines for nationally executed projects as well as UNIDO Guidelines on Technical Cooperation Programmes and Projects. The MoEU will assume the overall responsibility for the achievement of the project results. MoEU will sign the budgeted Annual Work Plan (AWP) with UNDP on an annual basis, as per UNDP rules and regulations, while MoEU will also make an agreement with UNIDO based on UNIDO rules and regulations or UNIDO may contract a third party for the execution of its, or part of its, components. MoEU will designate a senior official as the **National Project Director**

(NPD) for the project, in line with GEF rules and guidelines[39]. The NPD will be responsible for overall guidance to project management to (i) coordinate the project activities among the project and other Government entities; (ii) check that the expenditures are in line with approved budgets and work-plans; (iii) facilitate, monitor and report on the procurement of inputs and delivery of outputs; (iv) review the Terms of Reference for consultants and tender documents for sub-contracted inputs; and (v) supervise the reporting to UNDP and UNIDO on project delivery and impact.

A **Project Board (PB)** will be established at the inception of the project to monitor the project progress, to guide its implementation and to support the project otherwise in achieving its listed outputs and outcomes. It will be chaired by MoEU and be composed of the Ministry of Development (MOD), Ministry of Forestry and Water Affairs (GEF OFP), and Ministry of Foreign Affairs (MFA) as well as UNDP and UNIDO[40] in their capacity of GEF implementing agencies' oversight and strategic guidance responsibilities. Other members (e.g. industrial associations, research institutes)[41] can be invited by the decision of the PB on as-needed basis, however, by taking care that the PB remains operational by its size.

The final list of the PB members will be completed at the outset of project operations and presented in the Inception Report. The UNDP Project Managers (UNDP PM) and UNIDO Technical Coordinator (UNIDO TC) will participate as a non-voting member in the PB meetings and will also be responsible for compiling a summary report of the discussions and conclusions of each meeting. The PB will be chaired by the supervisor of the NPD of MoEU. The Project Board plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required co-financing resources are committed nationally and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it confirms the appointment and responsibilities of the UNDP PM and UNIDO TC and any delegation of its 'project assurance'. Based on the approved Annual Work Plan, the Project Board can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans, in agreement with GEF policy[42]. For further details about the role and functions of the PB, please see the draft Terms of Reference presented as an Annex E to this project document.

A **Project Management Unit (PMU)** set up by project partners will ensure adequate organizational structure and systems for facilitating implementation. The National Project Director will head the PMU and will be supported by UNDP PM and UNIDO TC. UNDP PM and UNIDO TC posts will be filled through a competitive process. UNDP PM will be responsible to manage Outputs: 1, 4 and 5; while UNIDO TC will be responsible to coordinate Outputs 2 and 3. UNDP PM will be supported for UNDP components by Project Finance and Procurement Officer (FPO), Administrative Assistant (AA), and Lead International and National Oversight experts, UNDP

[39] GEF/C.39/9 paragraph 22

[40] Assurance: supports the Project Board Executive by carrying out objective and independent project oversight and monitoring functions, in this case a representative from UNDP and UNIDO

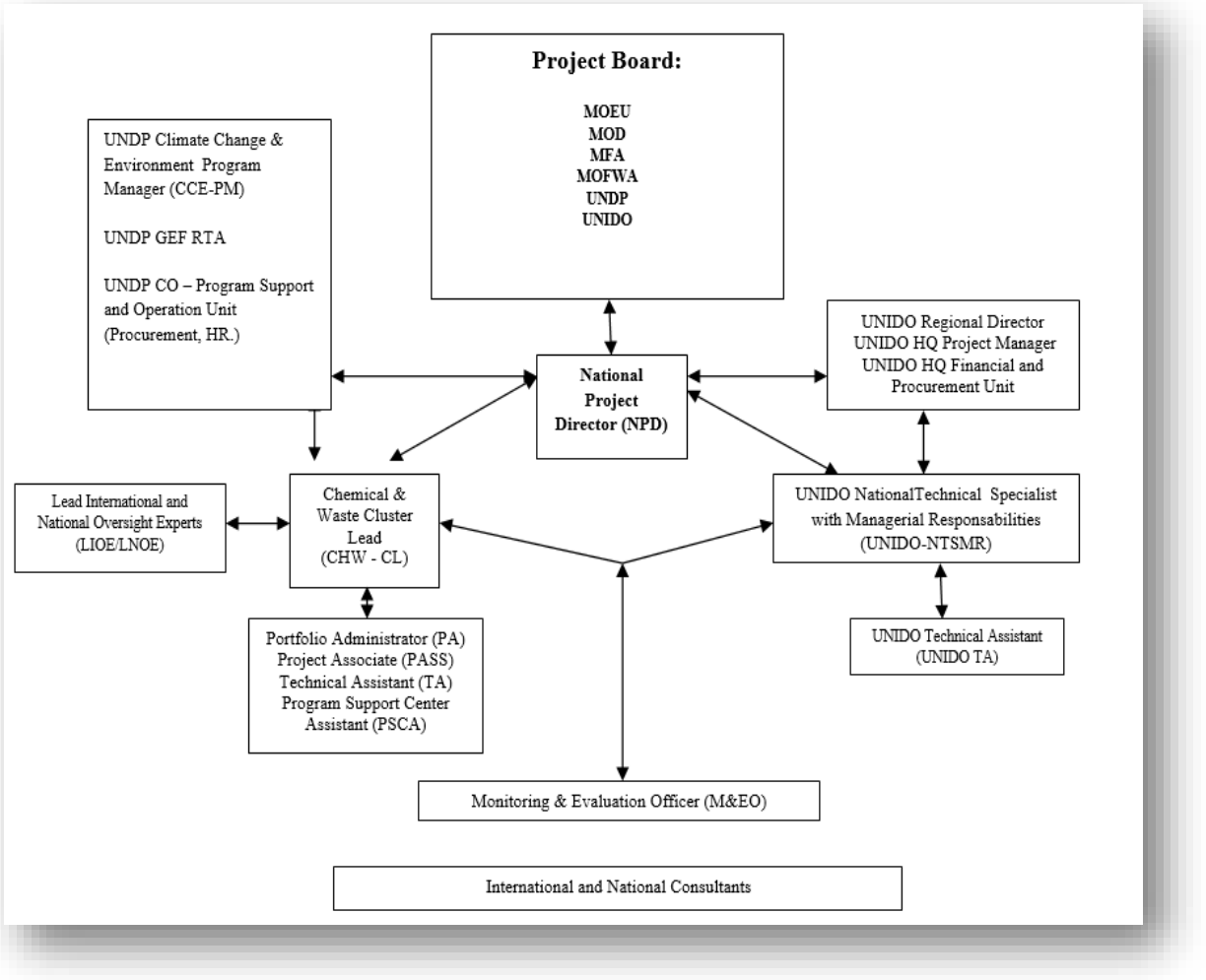
[41] Beneficiary: individual or group of individuals representing the interests of those who will ultimately benefit from the project.

[42] GEF/C.39/Inf.3 paragraphs 74 to 86

GEF RTA, UNDP Climate Change & Environment Program Manager, Program Support Associate and Operation Team (HR, Procurement and Finance) on the need basis. The Monitoring & Evaluation Officer (M&EO) is contracted by UNDP (M&E budget is allocated to UNDP), but will be responsible to provide M&E services to both Implementing Agencies in a collaborative and consultative manner and as per GEF Agency requirements. UNIDO TC and UNDP PM will be supported by UNIDO and UNDP Technical Assistants (UNIDO TA and UNDP TA) and will be providing expert support on the part time bases for field operations and implementation and UNIDO Director, UNIDO HQ Project Manager, Finance, Procurement and HR Unit on an as need basis. PMU will be responsible to submit all reports in English and Turkish. UNIDO TA and UNDP TA will be full-time resident assistants work in the project office in the MOEU.

Adequate numbers of technical national and international consultants in different disciplines will be associated on a longer-term or short-term basis depending upon the work load. Short job descriptions for the various positions/assignments are enclosed as an Annex to the CEO Endorsement Sheet. Requirement of additional support staff for fieldwork will be assessed and experts will be engaged on contract/assignment basis as per requirement. Procurement and contracting processes will be according to UNDP and UNIDO rules and regulations.

UNDP and UNIDO will maintain the oversight and manage the overall project budget for their respective components and their pro-rated share of the project management budget. UNDP will take the lead and UNIDO will provide the requested technical information for monitoring the project implementation, timely reporting of the progress to GEF as well as organizing mandatory and non-mandatory evaluations as laid down in the section related to Monitoring and Evaluation. Reporting requirements outlined in the M&E Section and indicated by GEF Rules and Agency requirements will be managed and coordinated with the assistance of the designated Monitoring and Evaluation Officer (M&EO) with the project management organization. The M&EO will be collecting the inputs to the GEF Regular Reports, after compilation of the report will consult with MOEU and UN Agencies to finalize the PIR and Tracking Tool reports. The M&EO will also support the Implementing Partners (local executing agencies in GEF terminology) in the procurement of the required expert services and other project inputs and administer the required contracts. Furthermore, it will support the co-ordination and networking with other related initiatives and institutions in the country.



IX. Monitoring Framework and Evaluation

The project will be monitored through the following M&E activities. The M&E budget is provided in the table below. UNDP will take the lead in M&E activities with UNIDO providing support and information. UNIDO will also provide information for reporting to GEF and also to feed SAP system annually.

Project start:

A Project Inception Workshop will be held within the first two months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

a) Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
b) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
c) Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
d) Discuss financial reporting procedures and obligations, and arrangements for annual audit.
e) Plan and schedule Project Board meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

- Progress made shall be monitored in the UNDP Enhanced Results Based Managment Platform.
- Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Annually:

- Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

  The APR/PIR includes, but is not limited to, reporting on the following:
  - Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
  - Project outputs delivered per project outcome (annual).
  - Lesson learned/good practice.
  - AWP and other expenditure reports
  - Risk and adaptive management
  - ATLAS QPR
  - Portfolio level indicators (i.e. GEF focal area tracking tool as well as Agencies annual indicators)) are used by most focal areas on an annual basis as well.

Periodic Monitoring through site visits:

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (insert date). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Centre (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

End of Project:

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Centre (ERC).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Audit: The project will undergo annual audit by a certified auditor according to UNDP rules and regulations, policies and procedures.

Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

Communications and visibility requirements:

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Similarly, UNIDO's corporate identity guidelines must be followed and can be accessed at http://intranet.unido.org/intranet/images/d/d3/2014-UNIDO_Corporate_identity_manual-March-last_draft.pdf.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Monitoring Framework and Evaluation, and Budget

Type of M&E activity	***Responsible Parties***	***Budget*** *(US$) excluding project staff time; all figures are indicative**	***Time frame***
Inception Workshop (IW) & associated arrangements	▪ Project Manager (PM) ▪ UNDP CO ▪ UNIDO PM	3,000	Within first two months of project start up
Inception Report	▪ Project Mgt. Unit ▪ UNDP CO ▪ National and international consultant support if needed	0 (included in routine project staff activity)	Immediately following IW
APR/PIR	▪ Monitoring and evaluation officer ▪ Project Mgt. Unit	0 (included in routine project staff activity)	Annually
Meetings of Technical Advisory Board and relevant meeting proceedings (minutes)	▪ PM ▪ UNDP CO ▪ Other stakeholders	0 (included in routine project staff activity)	Following Project IW and subsequently at least once a year
Meetings of Steering Committee and relevant meeting proceedings (minutes)	▪ PM ▪ UNDP CO ▪ National implementing agency	0 (included in routine project staff activity)	Once a year, ideally immediately following Technical Advisory Board meetings
Quarterly status reports	▪ Project Mgt. Unit	0 (included in routine project staff activity)	To be determined by Project team and UNDP CO
Technical monitoring, evaluation, and reporting within project components,	▪ Project Mgt. Unit ▪ National and international consultants as needed	26,000	Continuous, starting from project inception
Midterm Evaluation (external)	▪ Project Mgt. Unit ▪ UNDP CO ▪ UNDP/GEF RCU ▪ UNIDO/EVA	25,000	At the midpoint of project implementation.

Type of M&E activity	*Responsible Parties*	***Budget** (US$) excluding project staff time; all figures are indicative**	*Time frame*
	▪ External Consultants (i.e. evaluation team)		
Final Evaluation (external)	▪ External Consultants (i.e. evaluation team) ▪ Project Mgt. Unit ▪ UNDP CO ▪ UNDP/GEF RCU ▪ UNIDO/EVA	25,000	At the end of project implementation
Final Report	▪ External Consultant ▪ Project Mgt. Unit ▪ UNDP CO	(costs included in Terminal Evaluation, above)	At least one month before the end of the project
Compilation of lessons learned	▪ Project Mgt. Unit ▪ UNDP CO ▪ UNDP/GEF RCU	0 (included in routine project staff activity)	Annually
Financial audit	▪ UNDP CO ▪ Project Mgt. Unit	21,000	Annually
Visits to field sites	▪ PM ▪ UNDP CO ▪ UNDP/GEF RCU (as appropriate) ▪ National implementing agency	0 (included in routine project staff activity)	Annually or more frequently
TOTAL INDICATIVE COST (Excluding project team staff time, UNDP/UNIDO staff and travel expenses, and UNDP/UNIDO/Gov't contribution)		**100,000**	

***GEF funding only. Excludes in-kind and cash contributions from UNDP (US$100,000) and UNIDO (US$38,000)**

X. Legal Context

This document shall be the instrument referred to as such in Article-I of the SBAA between the Government of Turkey and UNDP signed on 21 October 1965 consistent with the attached Supplemental Provisions to the Project Document, attached hereto. Consistent with the above Supplemental Provisions, the responsibility for the safety and security of the executing agency and its personnel and property, and of UNDP's property in the executing agency's custody, rests with the executing agency. The executing agency shall: put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the

project is being carried; assume all risks and liabilities related to the executing agency's security, health and safety and the full implementation of the security plan. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

As regards UNIDO, the Government of the Republic of Turkey agrees to apply to the present project, mutatis mutandis, the provisions of the Revised Standard Technical Assistance Agreement concluded between the United Nations and the Specialized Agencies and the Government on 21 October 1965.

The UNDP Resident Representative in Ankara is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

a) Revision of, or addition to, any of the annexes to the Project Document;
b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

This document together with the CPAP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA and all CPAP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

a) Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
b) Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The executing entities agree to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

Audit clause

Financial reporting will follow existing provisions at UNDP/GEF and UNIDO. Any Audits will be conducted in accordance with the UNDP and UNIDO Financial Regulations and Rules and applicable audit policies on UNDP and UNIDO projects.

The present Project Document is made in three copies in English

XI. Annexes

Annex A. Project Results Framework

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: Outcome 2: Democratic and Environmental Governance
Country Programme Outcome Indicators: Securing the Merkim 2,500 m2 storage site to prevent further HCH release, packaging, transport and environmentally sound destruction of up to 3,000 t of HCH from the Merkim site (Y2018). Packaging, transport and environmentally sound destruction of at least 200 t of high concentration PCBs and PCB containing equipment (Y2018)
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): OUTPUT 3.3.8: Protection of health and environment through elimination of current POPs legacies, ensure longer term capacity to manage POPs into the future consistent with international practice and standards, and integrate POPs activities with national sound chemicals management initiatives.
Applicable GEF Strategic Objective and Program: GEF-5 Chemicals Strategy: Objective CHEM-1: Phase out POPs and Reduce POPs Releases
Applicable GEF Expected Outcomes: Outtcome 1.3: POPs releases to the environment reduced. Outcome 1.4: POPs waste prevented, managed and disposed of, and contaminated sites managed in an environmentally sound manner Outcome 1.5: Country capacity built to effectively phase out and reduce releases of POPs.
Applicable GEF Outcome Indicators: Indicator 1.3.1 Amount of un-intentionally produced POPs releases avoided or reduced from industrial and non-industrial sectors; measured in grams TEQ against baseline as recorded through the POPs tracking tool. Indicator 1.4.1 Amount of PCBs and PCB-related wastes disposed of, or decontaminated; measured in tons as recorded in the POPs tracking tool. Indicator 1.4.2 Amount of obsolete pesticides, including POPs, disposed of in an environmentally sound manner; measured in tons. Indicator 1.5.1 Progress in developing and implementing a legislative and regulatory framework for environmentally sound management of POPs, and for the sound management of chemicals in general, as recorded in the POPs tracking tool.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
Objective: Protection of health and environment through elimination current POPs legacies, ensure longer term capacity to manage POPs into the future consistent with international practice and standards, and integrate POPs activities with national sound chemicals management initiatives.	Major legacy POPs stockpiles (POPs pesticides and current/pending PCB based equipment) eliminated in an environmentally sound manner	• Globally significant large POPs pesticide stockpile remains without action beyond securing it and no more than token amounts being destroyed in the medium future. • 500 t of existing PCB based equipment scheduled for export and elimination in 2014 • Approximately 650t of additional PCB equipment identified as requiring phase out and elimination. • No fully qualified national capability for destruction of POPs stockpiles in place.	• Removal and environmentally sound destruction of 2,800 t of POPs pesticides. • Removal and environmentally sound destruction of at least an additional 200 t of PCB based equipment. • Qualification of one HTI facility for the environmentally sound destruction of POPs and POPs waste operating in Turkey	• Restoration of former storage site for productive use • Qualification of a second HTI facility for the environmentally sound destruction of POPs and POPs waste operating in Turkey	• Task specific reports and technical documentation. • Peer review of technical documentation. • Supervisory consultant reports. • Regulatory submission/ approval documents	• 500 t of PCB based equipment planned to be eliminated under the UNEP/MAP project in 2014, noting risks on this not occurring due to timing constraints and export/import approval timelines/ • No constraints exist with respect to co-financing availability from POPs stockpiles holders. • Cost estimates for elimination are conservatively high and sufficient to cover requirements.
	A long term PCB phase out plan assuring compliance with SC requirements is in place and capacity is in place to eliminate PCB cross contamination in electrical equipment and plans are in place for phase out and elimination of remaining PCBs based electrical equipment.	• National inventory of PCB based equipment still being developed. • Existence of PCB cross contaminated transformers identified but no systematic inventory identifying extent of the issue exists. • No clear PCB phase out plan operational with respect to addressing remain PCB issues in accordance with the SC. • No national capability available to treat cross contamination and retain such equipment in service.	• Comprehensive inventories exist for remaining PCB based equipment and PCB cross contaminated transformers as a result of full implementation of the 2005 PCB regulations. • A draft national PCB phase out plan is developed and under consultation for implementation • Technology and business arrangements identified for the establishment of national commercial capability to treat cross contaminated transformers	• A comprehensive PCB phase out Plan is in place and being implemented and time lines consistent with SC deadlines for phase out and elimination. • Commercial capability in place and operational for treatment of cross contaminated transformers.	• Task specific reports and technical documentation. • Supervisory consultant reports. • Regulatory submission/ approval documents • MoEU PCB inventory data base	• The 2005 regulations are effectively implemented and enforced to obtain appropriate inventories, without avoidance or illegal sub-standard disposal. • Cost effective business arrangements for required decontamination technology is available.
	Implemented regulatory framework for addressing contaminated sites and action initiated on POPs contaminated sites	• Framework legislation covering contaminated sites in place but not yet implemented. • No systematic action on identification and addressing POPs	• Framework legislation is under implementation inclusive of delivery of awareness programs and initial reporting and data collection.	• Regulations fully implemented with prioritized inventories and action plans. • Training delivered to a total of 200 technical professionals in site and	• Task specific reports and technical documentation. • Supervisory consultant reports.	• Holders of contaminated sites fail to fully disclose site conditions or agree to cooperate on initiating priority clean ups.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
		contaminated sites yet taken. • No effective financing mechanism in place to support contaminated site legacy issues	• Site assessment initiated on pilot sites. • Initial training delivered to 50 technical professionals in site and risk assessment and remediation technology	risk assessment and remediation technology • Site assessment, clean up design and initial containment/monitoring completed on 3 demonstration sites and regulatory mandated site evaluations on 4 sites.	• Documentation on training program delivery including quality feedback	• Positive interest (site holders and service providers in training opportunities
	Tracked and quantified continuing reductions in U-POPs release from major industrial sectors	• Although data on U-POP emission are available for some sectors, priority sector like I&S still lack of confirmed U-POP emission information and cost/effectiveness of BAT/BEP	• Plants for the measurement of U-POPs emission identified. E-POPs measurement plan finalized. U-POP emission measurement starts in at least one third of the identified facilities. • BAT/BEP demonstration plan finalized and agreed with relevant sectors, as a minimum including Kardemir and Isdemir facilities.	• U-POPs measurement completed for the selected facilities. • BAT/ BEP demonstration completed. • Potential reduction of U-POPs measured for each BAT/BEP demonstration. • Technology and cost/effectiveness consideration of the BAT/BEP technology available.	• Sampling and analytical reports. • U-POPs measurement reports for each facility • BAT/BEP preliminary and final report for each demonstration.	• A sound experimental procedure aimed at measuring at minimizing sampling uncertainty will be developed in cooperation with plant owners. • The large co-financing commitment will ensure that enough resources are available to conduct a successful measurement of U-POPs emission and BAT/BEP effectiveness. This will allow the derivation of realistic quantification of U-POPs releases and related countermeasures.
	Turkey can claim developed country status respecting POPs and sound chemicals management, with an institutional and regulatory framework fully harmonized with that of the EU and with including active participation as a donor and provider of	• Turkey has initiated a program targeting EU harmonization in this area. • A growing technical and service provider capability in this area exists but is not fully capable of meeting international standards. • No focused international technical assistance programs are in place in this	• Complete gap identification of all areas required for EU regulatory harmonization with respect to POPs, sound chemicals management and HW regulation generally. • Initiation of planning for TA programs on POPs and chemicals management for developing countries.	• Full EU regulatory harmonization achieved. • Sustained compliance with the SC. •	• Task specific reports and technical documentation. • Supervisory consultant reports. •	• Continued public policy commitment to EU harmonization and to adopting a developed country donor role.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
	environmental services to developing countries.	area for developing countries.	• Active contributions to the Global PIOs monitoring network being delivered			
Component 1: Elimination of Current POPs Stockpiles and Wastes						
Outcome 1.1 - Elimination and infrastructure removal from remaining POPs pesticide storage sites	Elimination of 3,038 t of POPs pesticides and POPs waste from the Merkim site and its environmentally sound destruction, including 2,800 t during project implementation.	• Elimination to date limited to approximately 500 t of POPs pesticides since 2007, including 238 t eliminated in anticipation of GEF support.	• All material on site packaged and removed either to interim storage or through to destruction • Operational/Safeguards training provided to 20 site staff. • Informed neighbours and public on planned activities	• All POPs pesticides and POPs waste from Merkim site eliminated in an environmental sound manner	• Inventory control and waste tracking documentation. • Supervisory consultant reports. • Regulatory inspection reports • Independent due diligence peer review reports • Documentation on training program delivery including quality feedback	• No regulatory barriers exist to undertaking the work. • Timely export/transit country/import approvals for destruction received. • Sufficient resources available
	Building demolition, removal, contaminated soil, restoration and monitoring of the Merkim site	• No action with respect to the site except for passive enterprise care and custody	• Building demolished and 4,000 t of materials removed and disposed of in a secure landfill • Informed neighbours and public on planned activities	• Site clean-up/remediation complete with 200 m^3 of contaminated soil removed and disposed of in a secure HW landfill. • Site restored and monitored	• Supervisory consultant reports. • Regulatory inspection reports • Disposal tracking documentation	• No regulatory barriers exist to undertaking the work. • Sufficient resources available
	Elimination of 30 t of obsolete pesticide stocks	• Currently accumulating stockpiles of OPs in MoA custody	• Material packaged collected, and delivered to Merkim disposal contractor for disposal by MoA.	• OP delivered eliminated with Merkim POPs pesticides	• Supervisory consultant reports. • Regulatory inspection reports • Disposal tracking documentation	• MoA is has resources to arrange for packaging, collection and delivery for coordinated disposal under arrangements for Merkim waste.
Outcome 1.2: Elimination of high concentration PCBs and PCB contaminated equipment stockpiles.	Elimination of minimum of 200 t of existing and pending PCB based equipment stockpiles	• Current PCB pending stockpiles available for elimination of approximately 650 t (excluding 500 t targeted for 2014 elimination under UNEP/MAP project).	• At least 200 t of currently/pending stockpiles exported for environmentally sound destruction	• Additional stockpiles of equipment being phased out eliminated using savings and available resources as may occur	• Inventory control documentation. • Supervisory consultant reports. • Regulatory inspection reports • Disposal tracking documentation • Independent due diligence peer review reports	• No regulatory barriers exist to undertaking the work • Quantities of PCB equipment for elimination are not increased and exceed available resources. • Timely export/transit

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
						country/import approvals for destruction received.
Outcome 1.3: Qualification of existing and developing POPs destruction facilities	Izaydas HTI facility fully qualified and permitted for POPs destruction inclusive of required upgrading and test burns	• Izaydas facility without proven capability to manage halogenated waste streams including POPs	• Required facility upgrading to materials handling, storage, APC systems completed for commercial halogenated (POPs) waste market • Test burn demonstrating capability to destroy POPs pesticides and PCBs completed and documented. • Informed neighbours and public on planned activities and results	• Izaydas facility fully permitted and actively participating in the national and potentially regional market for POPs destruction.	• Test burn performance reports • Regulatory inspection reports and issued permits • Supervisory consultant reports.	• Facility has the capability to be upgraded for required environmental performance. • Public and owner acceptance for participation in this market nationally and regionally. • National policies allowing potential import of POPs wastes
Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles						
Outcome 2.1: Implementation of national PCB regulation	Number of technical annex and guidance documents to the existing PCB legislation developed. Number of PCB owners on role and duties in relation to PCB rules (sampling, labelling, reporting), gender disaggregated	• Missing technical guidance on how to comply with the regulation has low to poor technical enforcement	• 3 Guidance document drafted. • 10 PCB owners (power generation and manufacturing industries) have a complete understanding of their role and duties. •	• Public control authorities have the capacity to monitor and verify compliance of PCB owners with the Turkey PCB regulation. • 30 PCB owners (power generation and manufacturing industries) have a complete understanding of their role and duties. • A guidance document on PCB regulation drafted in coordination between governmental and industrial stakeholders and adopted.	• Training reports (pre and post training assessment reports, training materials). • PCB regulation guidance document text and formal adoption.	Risk: training not effective – low participation in training. Countermeasures / assumptions: at PPG stage a high interest and commitment has been observed on PCB related issues. TO ensure its effectiveness, training will be preceded by a training needs assessment, and followed by test and questionnaires to measure the improvement of knowledge of the participants
Outcome 2.2: Systematic approach for the analytical determination of PCB in	Number of trained staff from industry on sampling, labelling, reporting, and prevention	• Industry managers and technical staff lack awareness and knowledge on PCB issue with	• At least one third of analytical data made available	• Industry managers and technical staff knowledgeable on the technical, environmental and financial	• Training reports (pre and post training assessment	• Risk: the main risk is the unavailability of electric industry of

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
electrical equipment, labelling and inventory	of cross contamination performed and certified Amount of sampling and analysis of transformers carried out Update of the PCB database with data on cross contaminated transformers.	specific reference to cross –contamination. • Analytical data on PCB contaminated equipment still limited • The PCB database established by the government does not contain information on PCB cross contaminated equipment	• Industry managers and technical staff knowledgeable on the technical, environmental and financial aspect of cross-contaminated PCB equipment	aspect of cross-contaminated PCB equipment. • A substantial set of analytical data made available and entered into the PCB database established by MoEU. • 8000 transformers sampled and analysed	reports, training materials). • PCB regulation guidance document text and formal adoption.	having their equipment sampled. This risk has been addressed at PPG stage, in the course of which awareness of industrial sector raised significantly, as testified by the number of electric industries expressing commitment to the project.
Outcome 2.3: Development and adoption of national PCB equipment treatment, phase out and retirement plan	Number of main industrial stakeholders from power generation and manufacturing industry consulted on PCB management plan priorities. PCB national management plan developed and adopted	• A national plan for PCB management, with special reference with cross PCB contaminated equipment is missing • No consultants on the topic	• First draft of the country national plan completed	• A country national plan for the phase out or treatment of PCB contaminated equipment, including specific sub-plans for the largest industries (electric power companies and large electricity consumers) drafted agreed among stakeholders and adopted.	• National plan and sub-plans for the phase out or treatment of contaminated equipment.	• Reliable and quantitative data will be made available by project implementation to ensure that the phase out and retirement plan is sound and sustainable
Outcome 2.4: Improvement of storage and maintenance of cross contaminated PCB equipment	Number of standards and Guidance Documents for prioritizing, maintenance, handling and storage of PCB contaminated equipment on-line, in use or temporarily stored issued. Physical or operational measures adopted for preventing release of PCB or human exposure to PCB from equipment on-line, in use or store.	• PCB contaminated transformers are not identified and therefore their management is weak.	• The knowledge on the management of PCB contaminated transformers is available in form of standard guidance documents. • Feasibility analysis of facility upgrade completed. • 2 standard and guidance documents issued • 3 companies adopting BEP	• The knowledge on the management of PCB contaminated transformers is available in form of standard guidance documents; • Facilities and methodologies for the environmentally sound temporary storage of PCB contaminated equipment are upgraded and available in the country. • 5 standard and guidance documents issued • 7 companies adopting BEP	• Standard and guidance documents draft and final reports	• Industry has shown commitment and made available a substantial amount of co-financing to ensure that there will be enough resources to develop physical capacity of capture, store and monitor PCB containment equipment. In this framework, the project will deliver the necessary technical assistance to ensure compliance with SC requirements.
Outcome 2.5: Verification of decontamination technology for PCB contaminated transformers remaining	Quantity of PCB contaminated equipment cleaned by technology demonstration, and demonstration reports released.	• Beside incineration and exporting for disposal of pure PCB transformers, there is no capacity in the country to decontaminated cross-contaminated transformers.	• Feasibility analysis completed. • Technology tested and contract with technology or service provider signed.	• A feasibility study supported by technical and financial grounds to assess decontamination technologies completed. • A technology for treating cross-contaminated	• Feasibility study preliminary and final report. • Technical specification and Bidding	A risk exist that the technology is not suitable, sustainable, effective or affordable. This will be addressed by selection of proven

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
in service and its pilot demonstration	Quantity of material recycled Value of recycled material Number of jobs created Quantity of CO_2 emissions reduced		• A feasibility study supported by technical and financial grounds to assess decontamination technologies completed.	transformers which is compliant with the Stockholm Convention and economically viable is available in the country. • At least 500 tons of low contamination PCB equipment treated • USD 5 Mio material worth recycled. • At least 10 jobs created • 100,000 tons CO_2 emissions reduced by replacement of old transformers by new equipment	documents for the technology. • Site visits – supervision reports • Proof of performance report of the technology, • Treatment logs	commercial technologies that have been successfully used elsewhere worldwide. This will further assured by a sound procurement phase which ensures that the technology procured fulfils technical and economical requirements. The final acceptance of the technology will be subjected to the successful completion of a proof of performance test.
Component 3: Unintended POPs Release Reduction						
Outcome 3.1: Determination and verification on an enterprise level of source and technology specific U-POPs emissions	Determination and verification on enterprise level of current PCDD/F emission factor – sintering plants and / or EAF Determination Determination and verification on enterprise level of current U-POPs emission factors - non-ferrous metal (Cu, Al, Zn) production Determination and verification on enterprise level of current U-POPs emission factor for other priority sectors Number of companies adopting BEP Number of people trained on PCDD/F sampling and analysis	• Emission factors for priority sectors assessed based on sampling and analytical data are missing. • There is the need to increase sampling and analytical capacity for PCDD/F at industrial stack	• Methodology report for U-POPs emission factor • At least one third of sampling and analysis carried out • Training material for sampling and analysis of PCDD/F at the stack delivered	• The determination of U-POPs factor on sintering plants, EAF, non-ferrous metal production, cement kiln has been reassessed based on both process consideration, sampling and analysis of U-POPs at exhaust gases, sampling and analysis of correlated pollutants (chlorine, particulate matter) • 5 factories adopting BEP • At least 10 laboratory staff trained on sampling and analysis of PCDD/F at industrial stacks	• Sampling and analytical reports; U-POPs emission factor reports • Training materials, reports, training attendance sheets	Risk • Sampling and testing of industrial stacks to generate U-POPs emission factor may lead to inconsistent results due to intrinsic sampling and analysis variability Assumption / countermeasures • Adoption of internationally accepted sampling and analytical methods, QA/QC procedures for PCDD/F analysis and sampling conducted during stable operational conditions of the plants will minimize the risk
Outcome 3.2: Provision of training and technical assistance on BAT/BEP	Number of people trained on U-POPs inventory. Number of people trained on BAT-BEP in priority	• The awareness and knowledge on U-POPs and BAT/BEP is still low and need to be strengthened.	• • Training material prepared.	• Training on U-POPs inventory, sampling and analysis performed: Training of at least 50 technical	• Training reports (pre and post training assessment reports)	

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
for priority industrial sectors	sectors		• At least 25 technical professionals trained on BAT-BEPs (gender disaggregated).	professionals on BAT-BEPs in 10 priority industrial sector (gender disaggregated).		of inconsistent results. Accurate measurement of the operational related parameters (temperature, fuel properties, raw properties of the materials fed to the plant) will also ensure to reduce variability of the estimate
Outcome 3.3: Development of a national U-POPs release reduction plan	Regulatory assessment report on U-POPs completed; Priority intervention areas identified. National U-POPs release reduction plan with risk based and cost-effectiveness priorities developed.	• A U-POPs national reduction plan in Turkey is still missing, although the country is participating in initiatives aimed at implementing EU-IPPC like regulation.	• Assessment of regulatory gaps. • Preliminary identification of priority areas and release reduction priorities.	Assessment of the regulatory gaps with reference to SC requirement and EU-IPPC regulation performed. Identification of areas with the highest priorities and cost/effectiveness in term of U-POPs reduction • Development of the national U-POPs release reduction plan for priority sectors with risk-based and cost/effectiveness priorities.	Regulatory assessment report. • National U-POPs release reduction plan	• Reliable and quantitative information on the cost and type of intervention for each specific sector are available based on international and national experience.
Outcome 3.4: Demonstration of BAT/BEP in industrial priority source categories	Number of sectors in which BAT / BEP has been effectively demonstrated. Number of companies adopting BAP/BEP Amount of incremental investment made Quantity of mercury releases reduced Quantity of I-TEQ/a reduced Quantity of CO_2 releases reduced	• Although EU IPPC Directive is not enforced yet, companies exporting to the EU are generally required to produce in compliance with BAT/BEP principles. However, few BAT/BEP process has been demonstrated in the country in priority sectors like I&S and non-ferrous metal.	• Demonstration facilities selected. • BAT/BEP to be demonstrated agreed with enterprises. • Demonstration methodologies report completed, including sampling and analytical schedule. • At least 3 of the 6 planned demonstrations started.	• -2 demonstrations and assessments of BAT/BEP in the iron and steel sector (sintering plants) completed. • 2demonstrations and assessments of BAT/BEP in the iron and steel sector (Electric arc furnaces) completed. • -2 demonstrations and assessments of BAT/BEP in the non-ferrous metal sector (copper, aluminium, and zinc) completed. • 6 companies adopting BAP/BEP • USD 30 Mio incremental investment • 5 grams TEQ/a reduction	• Demonstration methodologies report for each relevant sector. • BAT/BEP assessment report for each priority sector.	Risk • High costs associated with demonstration of BAT/BEP. Assumption / countermeasures • The project will provide technical and financial assistance for the assessment of BAT when these are implemented by the plants as co-financing contribution. • • In some cases, BEP demonstration may be preferred over BAT to

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
				• 100,000 tons CO2 emissions reduced by BAT/BEP introduction •		minimize cost, or BAT may be comparatively tested among plants equipped with it against
Component 4:Management Capacity for POPs Contaminated Sites						
Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	Soil Pollution Control and Point-Source-Contaminated Sites Regulation implemented with operational reporting, inventories and prioritized actions implemented.	• Regulation developed and passed but not implemented. • Limited awareness on the part of potential holders of contaminated sites. • No coordinated development of financing mechanisms beyond application of a simple polluter approach. • Limited technical capability in key assessment and technology related disciplines.	• Framework legislation is under implementation inclusive of initial reporting and data collection within the three governing management information systems. • Financial mechanism study initiated • Delivered awareness program on implementation of the regulations • Training delivered to 100 professionals in site and risk assessment • Training delivered to 100 total of professionals in remediation technologies	• Framework legislation is fully implemented inclusive impeded and fully operational reporting and data collection within the three governing management information systems. • Financial mechanism study completed and options being pursued • Training delivered to a total of 100 professionals in site and risk assessment • Training delivered to a total of 100 professionals in remediation technologies	• Task specific reports and technical documentation. • Regulatory reporting • Supervisory consultant reports. • Documentation on training program delivery including quality feedback	• Potential holders of contaminated sites make timely information submissions and comply on follow up actions required under the regulations. •
Outcome 4.2: : Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"	Demonstration site assessment/clean up design completed and containment/remediation/ monitoring initiated on three priority contaminated sites	• Action on cleaning up contaminated sites limited to fragmented initiatives driven primarily by individual enterprise initiatives.	• regulatory site assessment/site specific technology study initiatives started • Site assessment/clean up design completed on three priority sites	• regulatory site assessment/site specific technology study initiatives completed. • agreements with contaminated sites' holders made for arrangements for clean-up in place for three priority contaminated sites. • Containment/remediation/ monitoring initiated for three priority contaminated sites	• Task specific reports and technical documentation. • Regulatory reporting • Supervisory consultant reports	• Co-financing available for clean-up of the three priority contaminated sites.
Component 5: Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management						
Outcome 5.1: Legislative framework updated and adopted	Legal and regulatory framework governing POPs and HW	• Basic regulatory framework in place with gaps respecting EU	• Rotterdam Convention accession process completed, and	• Turkey has a legal and regulatory framework for POPs and HW	• Progress reports and technical outputs from EU	• Continued public policy commitment to EU harmonization

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
consistent with convention obligations adopted.	import/export fully harmonized with EU standards and compliant with the SC. Detailed planning policy and action plan in place and under implementation for developemnt of a broadly based POPs and chemicals waste mamagement infrastructure and services cability	harmonization, SC and Rotterdam, Convention compliance. • Gaps in required infrastructure and services capability to support the above and no planning to address it.	requirement integrated/embed into national legislation and regulations. • Gap analysis study on HW and POPs management infrastructure and services capability requirements initiated.	management fully harmonized with the EU and compliant with the SC and which supports provision of related services in the region. • An endorsed policy and action plan in place and being acted on related to the development of comprehensive HW and POPs management infrastructure,	IPA program documentation •Task specific reports and technical documentation •Supervisory consultant reports	and development of modern HW management capability
Outcome 5.2:Strengthened technical capacity including operational POPs monitoring, supporting analytical capability, and planning related research and development capability	Multi-media POPs monitoring capability and active participation contribution to the Global POPs Monitoring Network Expanded qualification of private sector POPs analytical and monitoring service capability available to government and others. Action Plan initiated for national R&D capability related to POPs and sound chemicals management.	• Comprehensive national POPs monitoring program limited to water basis and only fragmented monitoring of other media. • Regulatory analytical capability restricted to a single state research agency which limits enforcement activities • No targeted R&D programs related to POPs issues.	• Active participation in the Global POPs Monitoring Network initiated • Qualification and supporting training for expanded laboratory and monitoring capability initiated • Planning process for development of a POPs R&D program initiated	• Expanded and coordinated multi-media POPs monitoring programs in place and operational. • 5 private laboratories and service providers qualified for regulatory work. • POPs and chemicals management R&D program in place and financed	•Task specific reports and technical documentation • Supervisory consultant reports	• Continued policy commitment to expanded private sector laboratory utilization and directing resources to POPs and sound chemicals management R&D.
Outcome 5.3 Development and implementation of modern tools for a national sound chemicals management framework	EU REACH regulatory framework for sound chemicals management adopted in Turkey Supporting chemicals management information system, training and an increased level of awareness respecting sound chemicals management	• Developing but fragmented regulatory framework for sound chemicals management • Limited information availability, awareness at the user and public levels respecting chemicals management	• Development of a national chemicals profile and the REACH approach to chemicals management initiated. • Supporting information management systems under development • Training of 50 technical professions in sound chemicals management delivered. • 2awareness events and products produced.	• National chemicals profile in place and adopted • REACH approach to sound chemicals management adopted and operationalized in Turkey supported by an effective information management system • Overall delivery of training to 100 technical and management professions • 4 total awareness events and products produced for industry and the public	•Progress reports and technical outputs from EU IPA program documentation •Task specific reports and technical documentation • Supervisory consultant reports • Documentation on training program delivery	• EU programs are sustained and policy commitment maintained to a sound chemicals management regime.

	Indicator	Baseline	Targets		Sources of verification	Risks and assumptions
			Mid-term	End of project		
					including quality feedback	
Component 6: Monitoring, learning, adaptive feedback, outreach, and evaluation						
Outcome 6: Monitoring, learning, adaptive feedback, outreach, and evaluation.	M&E and adaptive management applied to project in response to needs, mid-term evaluation findings with lessons learned extracted.	• No Monitoring and Evaluation system • No evaluation of project output and outcomes	• Monitoring and Evaluation system developed. • Mid-term-evaluation of project output and outcomes conducted with lessons learnt at 30 months of implementation.	• Final evaluation report ready in the end of project	• Project document inception workshop report. • Independent mid-term evaluation report.	• Availability of reference material and progress reports • Cooperation of stakeholder agencies and other organizations.

Annex B. Total Budget and Work Plan

Award ID:	**UNDP: 00082077**
Award Title:	**PIMS – UNDP: 4833; UNIDO: 100292 - POPs Legacy Elimination and POPs Release Reduction Project**
Project ID:	**UNDP: 00091144**
Project Title:	**PIMS – UNDP: 4833; UNIDO: 100292 - POPs Legacy Elimination and POPs Release Reduction Project**
Executing Agency:	**Ministry of Environment and Urbanization**

GEF Outcome/Atlas Activity	Responsible Party (Implementing Agent)	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount (USD) Year 1	Amount (USD) Year 2	Amount (USD) Year 3	Amount (USD) Year 4	Total (USD)	Budget notes
Outcome 1 - Elimination of Current POPs Stockpiles/Wastes - UNDP		62000	GEF	71200	International Consultants	50,000	75,000	50,000	25,000	200,000	1
				71300	Local Consultants	55,000	80,000	64,500	40,000	239,500	2
				71400	Contractual Services - Individ	15,000	20,000	15,000	10,000	60,000	3
				72100	Contractual services - Companies (POPs/PCB disposal, qualication of incinerators)	550,700	2,072,300	1,122,300	550,700	4,296,000	4
				72300	Materials and Goods	250,000	250,000			500,000	4
				72400	Communication and Audio visual equipment	2,500	2,500			5,000	5
				74500	Miscellaneous Expenses	100	200	100	100	500	6
				75700	Workshops (public consultations, trainings)	5,000	5,000	5,000	5,000	20,000	7
				71600	Travel (national)	5,000	5,000	5,000	5,000	20,000	8
				74200	Audio Visual&Print Prod Costs	1,000	1,000	1,000	1,000	4,000	9
	TOTAL OUTCOME 1					**934,300**	**2,511,000**	**1,262,900**	**636,800**	**5,345,000**	
Outcome 2. Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles - UNIDO		62000	GEF	71200	International Consultants	45,250	39,680	32,340	8,190	125,460	
				71300	Local Consultants	93,020	48,760	34,160	8,050	183,990	
				72100	Contractual services - Companies	363,270	437,610	329,410	81,510	1,211,800	
				75700	Workshops	45,270	20,390	18,950	3,400	88,010	
				71600	Travel	16,260	6,680	5,870	2,430	31,240	
				74200	Audio Visual&Print Prod Costs	23,000	19,000	12,000	5,500	59,500	
	TOTAL OUTCOME 2					**586,070**	**572,120**	**432,730**	**109,080**	**1,700,000**	
Outcome 3: Unintended POPs Release Reduction - UNIDO		62000	GEF	71200	International Consultants	46,850	75,400	55,740	11,820	189,810	
				71300	Local Consultants	28,460	43,280	30,450	5,820	108,010	
				72100	Contractual services - Companies	360,480	603,120	402,110	96,730	1,462,440	
				75700	Workshops	39,230	51,940	30,190	3,640	125,000	

				71600	Travel	20,000	23,040	12,480	720	56,240	
				74200	Audio Visual&Print Prod Costs	14,000	28,000	12,500	4,000	58,500	
					TOTAL OUTCOME 3	**509,020**	**824,780**	**543,470**	**122,730**	**2,000,000**	
Outcome 4: Management Capacity for POPs Contaminated Sites - UNDP		62000	GEF	71200	International Consultants		100,000	75,000	25,000	200,000	10
				71300	Local Consultants		100,000	65,000	20,000	185,000	11
				71400	Contractual Services - Individ		25,000	10,000		35,000	12
				72100	Contractual services - Companies			250,000		250,000	13
				75700	Workshops		5,000	5,000	5,000	15,000	14
				71600	Travel		5,000	5,000	5,000	15,000	15
					TOTAL OUTCOME 4	**0**	**235,000**	**410,000**	**55,000**	**700,000**	
Outcome 5 : Institutional/ Regulatory Capacity Strengthening for POPs and Sound Chemicals Management - UNDP		62000	GEF	71200	International Consultants	50,000	50,000	40,000		140,000	16
				71300	Local Consultants	80,000	80,000	60,000	10,000	230,000	17
				71400	Contractual Services - Individ	15,000	15,000	10,000		40,000	18
				75700	Workshops	10,000	5,000	5,000	10,000	30,000	19
				74200	Audio Visual&Print Prod Costs	5,000	5,000	5,000	5,000	20,000	20
					TOTAL OUTCOME 5	**160,000**	**155,000**	**120,000**	**25,000**	**460,000**	
Component 6 : Project Monitoring (PMON) - UNDP		62000	GEF	71200	International Consultants		15,000		15,000	30,000	21
				71300	Local Consultants	10,250	10,250	10,250	10,250	41,000	22
				71600	Travel (national and international)		2,500		3,500	6,000	23
				71400	Contractual Services - Audit		10,000		11,000	21,000	24
				72200	Equipment and Furniture	1,000				1,000	25
				74500	Miscellaneous Expenses	200	300	200	300	1,000	26
					TOTAL OUTCOME 6	**11,450**	**38,050**	**10,450**	**40,050**	**100,000**	
Project Management		62000	GEF	**UNDP**							
				74599	DPC costs	12,000	12,000	12,000	12,000	48,000	27
				71400	Contractual Services - Individ	62,500	62,500	62,500	62,500	250,000	28
				71600	Travel	3,000	3,000	3,000	3,000	12,000	29
				72200	Equipment and Furniture	10,000				10,000	30
				72400	Communic & Audio Equip	1,000	1,000	1,000	1,000	4,000	31
				74200	Audio Visual&Print Prod Costs	1,000	500	0	0	1,500	32
				74500	Miscellaneous Expenses	200	300	200	200	900	33
					Sub-total for UNDP	**89,700**	**79,300**	**78,700**	**78,700**	**326,400**	
				UNIDO							
				71300	Local Consultants	8,400	8,400	0	0	16,800	
				71400	Contractual Services - Individ	36,600	36,600	36,600	36,600	146,400	
				71600	Travel	2,800	2,800	2,800	2,800	11,200	

				72200	Equipment and Furniture	5,200	0	0	0	5,200	
				72400	Communic & Audio Equip	600	600	600	600	2,400	
				74200	Audio Visual&Print Prod Costs	500	300			800	
				74500	Miscellaneous Expenses	200	200	200	200	800	
					Sub-total for UNIDO	**54,300**	**48,900**	**40,200**	**40,200**	**183,600**	
					TOTAL Project Management	**144,000**	**128,200**	**118,900**	**118,900**	**510,000**	
					Full Components Total UNDP	**1,195,450**	**3,018,350**	**1,882,050**	**835,550**	**6,931,400**	
					Full Components Total UNIDO	**1,149,390**	**1,445,800**	**1,016,400**	**272,010**	**3,883,600**	
					GRAND TOTAL	**2,344,840**	**4,464,150**	**2,898,450**	**1,107,560**	**10,815,000**	

General notes to the budget:

- International consultants (IC) are budgeted at $ 4000 per week and short-term national consultants (NC) are budgeted at $ 2000 per week.
- The cost of workshops has been divided of various budget lines as per UNDP ATLAS budget which does not have a separate budget line for training / workshops. For example, budget line 'international consultant' will have a % allocation for international experts to support workshops. The number of workshops for each outputs is given in the 'results framework'. A workshop will cost about USD 2,500 per day.

Specific notes:

1. 30 person/weeks of international expertise, 100 person/weeks for elimination of POPs stockpiles/waste and oversight.
2. 120 person/weeks of local expertise and assistance to international experts
3. 20 person/weeks of lead international expert and 20 person/weeks lead national expert for oversight for POPs stockpiles/waste elimination.
4. Subcontractors for POPs elimination and site remediation.
5. Subcontracts with companies for trainings and workshops.
6. Miscellaneous expenses.
7. Equipment, rental, premises, rental equipment for workshop and event organization.
8. Travel cost (DSA and ticket) is budgeted at 25% of international consultant's fee and 8% of national consultant's fee as a general rule-of thumb.
9. Printing and reproduction cost of background studies and workshop papers and proceedings; Info tech equipment, includes software acquisition for database management.
10. 50 person/weeks of international expertise for training and capacity building for POPs contaminated sites management.
11. 93 person/weeks of local short-term consultancy for training and capacity building for POPs contaminated sites management.
12. Equipment, rental premises, rental equipment for workshop and event organization
13. Subcontracts with companies for pilot remediation of contaminated sites
14. Subcontracts with companies and individuals for trainings and workshops.
15. Travel cost (DSA and ticket) is budgeted at 25% of international consultant's fee and 8% of national consultant's fee as a general rule-of thumb.
16. 35 person/weeks of international expertise for institutional/regulatory capacity strengthening for POPs and sound chemicals management.
17. 115 person/weeks of local short-term consultancy for institutional/regulatory capacity strengthening for POPs and sound chemicals management.
18. Company/individual consultant services for support and for technical assistance for capacity strengthening for POPs and sound chemicals management.
19. Equipment, rental premises, rental equipment for workshop and event organization.
20. Printing and reproduction cost of workshop papers and proceedings as well as printing of audit methodology paper and audit reports.
21. 8 person/weeks of international expertise for project monitoring and evaluation (midterm and final) and formulation of action plan.
22. 20.5 person/weeks of local consultancy for project monitoring and evaluation and formulation of action plan.
23. Travel cost (DSA and ticket) is budgeted at 25% of international consultant's fee and 8% of national consultant's fee as a general rule-of thumb.
24. Professional services for annual financial auditing of the project.

25. Equipment needed to perform monitoring and evaluation services.
26. Miscellaneous expenses.
27. Direct Project Support Costs.
28. Project manager (192 person/weeks at USD 750/week), 1 project finance and procurement officer (192 person/weeks at USD 375/week); 1 project assistant (192 person/per week at USD 229/week).
29. Travel cost (DSA and ticket).
30. Equipment needed to perform project management services.
31. Communication and Audio Equipment to perform project management services.
32. Printing and reproduction cost of workshop papers and proceedings as well as printing of audit methodology paper and audit reports.
33. Miscellaneous expenses.

Summary of Funds:	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	**Total**
GEF	2,344,840	4,464,150	2,898,450	1,107,560	**10,815,000**
UNDP	85,000	100,000	85,000	100,000	370,000
UNIDO	39,500	39,500	39,500	39,500	158,000
National Government	3,445,000	3,445,000	3,445,000	3,445,000	13,780,000
European Commission (EU IPA Programme)	1,347,500	1,347,500	1,347,500	1,347,500	5,390,00
Private Sector	25,200,000	23,635,000	6,390,000	5,606,583	60,831,583
Total Non-GEF	**28,787,000**	**32,802,000**	**11,787,000**	**11,388,583**	**80,529,583**
TOTAL	**31,133,140**	**37,257,450**	**14,695,150**	**12,513,843**	**91,344,583**

For the detailed information on segregated level of co-finance, please refer to the CEO Project Document, Part I, Table C – Sources of Confirmed Co-financing for the Project by Source and by Name

Annex C. Risk analysis

The overall risk rating attached to project is considered medium.

Minor climate change risks may be associated with the project largely through fossil fuel consumption associated with its physical implementation including a significant materials handling and transportation element, and its use of high temperature incineration or other thermal or moderately high energy consumption processes for the treatment and destruction of POPs and POPs wastes. However, these are small considering the future climate impact of these contaminants becoming more widely distributed in the environment and then much large volumes of contaminated material having to be captured and treated. On the positive side these are also more than compensated by the modernization stimulated by the project in the replace of aging less energy efficient electrical equipment and industrial process upgrading associated with the U-POPs reduction which typically also entail energy efficiency and resource use reduction.

The following provides an overall risk matrix that identifies and rates specific risks identified and mitigation strategy adopted

Risk	**Risk rating**	**Risk mitigation strategy**
Lack of institutional cooperation between key stakeholders, particularly Ministry of Environment and Urbanization, Ministry of Forestry and Water Management, Ministry of Agriculture, Ministry of Development, Ministry of Foreign Affairs, and regional/local environmental authorities and governments.	Low	The project's preparation and implementation arrangements build upon the long positive and mature working relationship between these key institutional stakeholders in addressing environmental issues generally, and in particular in the Izmit/Kocaeli region where a number of project initiatives are focused. Additionally, a clear understanding and agreement exists respecting each institution's roles and responsibilities for various aspects of the project during implementation. This is formalized through the project management arrangements (Section VIII) which provide for a multi-stakeholder Project Steering Committee allowing broad institutional representation. This will ensure the resolution of operational issues as they appear.
Failure of the current framework for hazardous and chemicals waste to adequately and efficiently cover project activities and requirements, both in supporting the actions being implemented and in appropriately providing for their timely and rigorous approvals.	Low	Turkey has a well-developed regulatory framework for hazardous and chemicals waste management framework along with equally mature developed framework for emission and release control to air and water, all of which include specific provisions covering POPs and control of their release. The project itself is targeting the support of effective implementation of key aspects where these are still being put in place and operationalized (i.e. PCB phase out, contaminated sites, BAT/BEP standards) which allows some flexibility to use Project initiatives to demonstrate, test and fine tune the applicable regulatory regime's and deal with specific cases of counterproductive regulatory barriers. In that regard, the Project has adopted referenced international standards and guidelines in these areas. This in association with parallel EU supported work will further serve to guide national regulatory authorities in these areas through project implementation with the results that tested approaches applied being applied by well-informed regulators and those in the private sector being regulated.

Risk	Risk rating	Risk mitigation strategy
Issue avoidance, slow information request responses, and failure to cooperate with regulatory authorities by enterprises and limited enforcement capacity and effort by regulatory authorities limits Project access to high impact POPs elimination and release reduction opportunities.	Moderate	As has been observed historically and during the PPG stage in some areas, some enterprises that are POPs holders and/or sources of POPs release are reluctant to actively get involved for a variety of reasons. In general this will be mitigated by promotion of both greater but also a balanced and flexible approach to regulatory enforcement that includes incentives as well as punitive action. This will include special consideration respecting compliance requirements when participating that serve as demonstration. As has already been applied in relation to contaminated sites. It will also involve financial incentives, both through the assistance that GEF money provides but also fostering real PPP arrangements, all intended to create win-win rather than adversarial situations.
Absence of commercial availability of demonstrated, environmentally sound, cost effective technology and techniques for the treatment, and/or destruction of POPs and contaminated materials, and the reduction of U-POPs releases.	Low	While technology and its availability for application where required can be a limitation in these kinds of projects, the design of the Project is based on employing well proven commercial technologies available through competitive practice all of which will have been demonstrated in similar applications and locations elsewhere if not already in Turkey. The only issues that might arise are associated with transfer of technology and associated practice. This is mitigated generally by the adoption of an approach of targeting BAT/BEP in these activities, as well as application of a rigorous qualification and competitive test in their selection and associated service providers. More specifically, the project design for dealing with the large volume, high GEB impact legacies associated with POPs pesticides and PCB stockpiles will generally involve the use of proven and highly competitive HTI facilities and scrap equipment decontamination facilities in EU. Likewise, the treatment of cross contaminated electrical equipment will use established de-halogenation process technology imported to the country and similarly contaminated site remediation will utilize site specific combinations of soil treatment and containment technologies and techniques. In the case of U-POPs release reduction the direct application of BAT/BEP approach based on the EU IPPC methodology based on BREF standards has been adopted.
Insufficient technical and financial commitment from enterprises holding POPs, contaminated sites and/or being responsible for U-POPs release sources.	Moderate	The required high level of commitment required from a broad range of enterprises for the project in addressing issues that in many cases are new and involve unanticipated financial and operational impacts creates risks of non-cooperation and avoidance. Countering this risk within the project design is the generally strengthening of regulatory capacity both with respect to traditional command-and-control approaches but also through voluntary compliance as reflected in adoption of models used in the EU to promote BAT/BEP and the use of progressive economic instruments and PPP arrangements for financing mechanisms. The strong emphasis on awareness and training built into the project design also ensures sufficient understanding to allow enterprises to assume a more forward looking and long term perspective.

Risk	Risk rating	Risk mitigation strategy
Costs estimated for various project activities, particularly those associated with the elimination of POPs stockpiles are insufficient to achieve the elimination targets.	Low	The risk of underfunding and being unable to complete tasks, particularly those associated with direct legacy issues such as POPs stockpiles and contaminated sites is addressed through use of conservative cost and quantity estimates, linkage directly to current competitive market pricing. In addition, a perquisite of initiating any specific activity where non-completion potentially leaves a significant risk or negative direct environmental impact with completion guarantees and reconfirmation of co-financing.
Change in Project's priorities after implementation is started, associated with non-completion of anticipated parallel PCB elimination initiatives	Moderate	While not a direct project risk, some completion risk exists with respect to the UNEP/MAP Projects intention to eliminate 500 t of PCB based equipment in 2014 before that project closes. This could leave a quantity of high impact stockpiles without financial capacity to be eliminated and might result in the current project being asked to adjust its priorities to accommodate this material. At this point no direct mitigation is envisioned but the Project would retain sufficient flexibility to allow discussion with the government and GEF on obtaining these resources through some combination of increased co-financing, access to unused GEF resources and potentially the re-allocation of resources from components with lower net GEB if so desired.
Training effectiveness limited, qualification of trainee sub-standard or training needs not properly assessed due to limited participation or limited quality control	Low	All training activities have been identified both by counterparts and confirmed by experts during PPG stage inclusive of applying comparable international experience. Training sessions' candidates will have to pass an initial test which will serve also as baseline; and a final test, which will demonstrate the progress achieved and hence effectiveness of the training. The trainees passing the final test will receive an official certificate issued by the Project and/or IAs. The above will ensure at the same time willingness to attend training course and quality/effectiveness of the training.
Equipment and facility owners unwilling to allow access for purposes of evaluation, testing and sampling of their facilities and equipment.	Low	This risk will be mitigated in part by focus of project activities on partnerships with willing participants and beneficiaries who are also supplying co-financing as formalized in written commitment documents. In cases where broader inventories are involved such as the case of PCB cross contaminated transformers regulatory enforcement has been committed to by MoEU under the applicable regulations reinforced by the approval of an official guidance documents, together with awareness raising activities aimed at explaining risk, liability and hidden costs for PCB owners will facilitate their participation. This awareness raising activity already started successfully at the PPG stage of the project.

The project will be monitored and evaluated on a regular basis according to applicable GEF and UNDP/UNIDO procedures for results-based management. An annual reporting exercise in the form of the project implementation review (PIR) will take place, where the project will be tracked for progress against the relevant performance indicators, evaluated for progress made towards development results, and assessed with regard to its degree of adaptive management and its flexibility to respond to changing circumstances.

Annex D. Agreements and Letters of Support

Attached to the submission package

Annex E. Terms of Reference of Key Project Personnel

At the Project's Inception Workshop, the structure of the project management unit will be reviewed and approved, which will then be followed by the formulation of key TORs for the project personnel.

Annex F. UNDP Environmental and Social Screening Report

UNDP Environmental and Social Screening Template (December 2012)

QUESTION 1:

Has a combined environmental and social assessment/review that covers the proposed project already been completed by implementing partners or donor(s)?

Select answer below and follow instructions:

☒ →NO: Continue to Question 2 (do not fill out Table 1.1)

☐→YES: No further environmental and social review is required if the existing documentation meets UNDP's quality assurance standards, and environmental and social management recommendations are integrated into the project. Therefore, you should undertake the following steps to complete the screening process:

1. Use Table 1.1 below to assess existing documentation. (It is recommended that this assessment be undertaken jointly by the Project Developer and other relevant Focal Points in the office or Bureau).
2. Ensure that the Project Document incorporates the recommendations made in the implementing partner's environmental and social review.
3. Summarize the relevant information contained in the implementing partner's environmental and social review in Annex A.2 of this Screening Template, selecting Category 1.
4. Submit Annex A to the PAC, along with other relevant documentation.

Note: Further guidance on the use of national systems for environmental and social assessment can be found in the UNDP ESSP Annex B.

TABLE 1.1: CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT	**Yes/No**
1. Does the assessment/review meet its terms of reference, both procedurally and substantively?	
2. Does the assessment/review provide a satisfactory assessment of the proposed project?	
3. Does the assessment/review contain the information required for decision-making?	
4. Does the assessment/review describe specific environmental and social management measures (e.g. mitigation, monitoring, advocacy, and capacity development measures)?	
5. Does the assessment/review identify capacity needs of the institutions responsible for implementing environmental and social management issues?	
6. Was the assessment/review developed through a consultative process with strong stakeholder engagement, including the view of men and women?	
7. Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?	

Table 1.1 (continued) For any "no" answers, describe below how the issue has been or will be resolved (e.g. amendments made or supplemental review conducted).

QUESTION 2:

Do all outputs and activities described in the Project Document fall within the following categories?

☒Procurement (in which case UNDP's Procurement Ethics and Environmental Procurement Guide need to be complied with)

☒Report preparation

☒Training

☒Event/workshop/meeting/conference (refer to Green Meeting Guide)

☒ Communication and dissemination of results

Select answer below and follow instructions:

☒**NO** → Continue to Question 3

☐**YES** → No further environmental and social review required. Complete Annex A.2, selecting Category 1, and submit the completed template (Annex A) to the PAC.

QUESTION 3:

Does the proposed project include activities and outputs that support *upstream* planning processes that potentially pose environmental and social impacts or are vulnerable to environmental and social change (refer to Table 3.1 for examples)? (Note that *upstream* planning processes can occur at global, regional, national, local and sectoral levels)

Select the appropriate answer and follow instructions:

☐ **NO** → Continue to Question 4.

☒ **YES** →Conduct the following steps to complete the screening process:

1. Adjust the project design as needed to incorporate UNDP support to the country(ies), to ensure that environmental and social issues are appropriately considered during the upstream planning process. Refer to Section 7 of this Guidance for elaboration of environmental and social mainstreaming services, tools, guidance and approaches that may be used.
2. Summarize environmental and social mainstreaming support in Annex A.2, Section C of the Screening Template and select "Category 2".
3. If the proposed project ONLY includes upstream planning processes then screening is complete, and you should submit the completed Environmental and Social Screening Template (Annex A) to the PAC. If downstream implementation activities are also included in the project then continue to Question 4.

TABLE 3. 1 EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS	Check appropriate box(es) below
1. Support for the elaboration or revision of **global- level** strategies, policies, plans, and programmes.	N/A. The project though contributes to the implementation of

TABLE 3. 1 **EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS**	Check appropriate box(es) below
For example, capacity development and support related to international negotiations and agreements. Other examples might include a global water governance project or a global MDG project.	the Stockholm Convention on the global scale
2. Support for the elaboration or revision of **regional-level** strategies, policies and plans, and programmes. *For example, capacity development and support related to transboundary programmes and planning (river basin management, migration, international waters, energy development and access, climate change adaptation etc.).*	
3. Support for the elaboration or revision of **national-level** strategies, policies, plans and programmes. *For example, capacity development and support related to national development policies, plans, strategies and budgets, MDG-based plans and strategies (e.g. PRS/PRSPs, NAMAs), sector plans.*	x
4. Support for the elaboration or revision of **sub-national/local-level** strategies, polices, plans and programmes. *For example, capacity development and support for district and local level development plans and regulatory frameworks, urban plans, land use development plans, sector plans, provincial development plans, provision of services, investment funds, technical guidelines and methods, stakeholder engagement.*	x

QUESTION 4:

Does the proposed project include the implementation of *downstream* activities that potentially pose environmental and social impacts or are vulnerable to environmental and social change?

To answer this question, you should first complete Table 4.1 by selecting appropriate answers. If you answer "No" or "Not Applicable" to all questions in Table 4.1 then the answer to Question 4 is "NO." If you answer "Yes" to any questions in Table 4.1 (even one "Yes" can indicated a significant issue that needs to be addressed through further review and management) then the answer to Question 4 is "YES":

☐ **NO** → No further environmental and social review and management required for downstream activities. Complete Annex A.2 by selecting "Category 1", and submit the Environmental and Social Screening Template to the PAC.

☒ **YES** → Conduct the following steps to complete the screening process:

1. Consult Section 8 of this Guidance, to determine the extent of further environmental and social review and management that might be required for the project.
2. Revise the Project Document to incorporate environmental and social management measures. Where further environmental and social review and management activity cannot be undertaken prior to the PAC, a plan for undertaking such review and management activity within an acceptable period of time, post-PAC approval (e.g. as the first phase of the project) should be outlined in Annex A.2.
3. Select "Category 3" in Annex A.2, and submit the completed Environmental and Social Screening Template (Annex A) and relevant documentation to the PAC.

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT		
1.	**Biodiversity and Natural Resources**	**Answer** (Yes/No/ Not Applicable)
1.1	Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat?	Generally not applicable. Potential contaminated sites initiatives would include restoration of shoreline habitat and permanent protection.
1.2	Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?	Not applicable
1.3	Would the proposed project pose a risk of introducing invasive alien species?	No
1.4	Does the project involve natural forest harvesting or plantation development without an independent forest certification system for sustainable forest management (*e.g. PEFC, the Forest Stewardship Council certification systems, or processes established or accepted by the relevant National Environmental Authority*)?	No
1.5	Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of independent certification to ensure sustainability (*e.g. the Marine Stewardship Council certification system, or certifications, standards, or processes established or accepted by the relevant National Environmental Authority*)?	Not applicable
1.6	Does the project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction.*	No. Only limited in scale POPs/heavy metals soil clean-up will be demonstrated by the project
1.7	Does the project pose a risk of degrading soils?	Potentially yes since the project will involve land decontamination at pilot project sites, though in some cases in industrial areas. Restoration measures will be put in place in each pilot case.
2.	**Pollution**	**Answer** (Yes/No/ Not Applicable)
2.1	Would the proposed project result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and transboundary impacts?	Potentially yes. POPs pesticides repackaging, including storage cleaning and demolishing potential result in the release of pollutants but would be substantively mitigated by standard hazardous waste management practice and procedures
2.2	Would the proposed project result in the generation of waste that cannot be recovered, reused, or disposed of in an environmentally and socially sound manner?	No
2.3	Will the propose project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs?	No. Obsolete POPs pesticides/PCBs will be repackaged and disposed

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT		
	For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants, or the Montreal Protocol.	of, storage site cleaned and demolished with clean debris sent for municipal storage.
2.4	Is there a potential for the release, in the environment, of hazardous materials resulting from their production, transportation, handling, storage and use for project activities?	Yes. Required safeguards will be put in place in line with international standards during project operations
2.5	Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	No
3.	**Climate Change**	
3.1	Will the proposed project result in significant[43] greenhouse gas emissions? *Annex E provides additional guidance for answering this question.*	No. Not significant nationally and globally. Temporary operation of POPS pesticides/materials/soils/ PCBs handling during access, repacking, decontamination and transportation for final disposal through internationally accepted thermal destruction processes is planned.
3.2	Is the proposed project likely to directly or indirectly increase environmental and social vulnerability to climate change now or in the future (also known as maladaptive practices)? You can refer to the additional guidance in Annex C to help you answer this question. *For example, a project that would involve indirectly removing mangroves from coastal zones or encouraging land use plans that would suggest building houses on floodplains could increase the surrounding population's vulnerability to climate change, specifically flooding.*	No
4.	**Social Equity and Equality**	**Answer** (Yes/No/ Not Applicable)
4.1	Would the proposed project have environmental and social impacts that could affect indigenous people or other vulnerable groups?	No
4.2	Is the project likely to significantly impact gender equality and women's empowerment[44]?	No
4.3	Is the proposed project likely to directly or indirectly increase social inequalities now or in the future?	No

[43] Significant corresponds to CO_2 emissions greater than 100,000 tons per year (from both direct and indirect sources). Annex E provides additional guidance on calculating potential amounts of CO_2 emissions.

[44] Women are often more vulnerable than men to environmental degradation and resource scarcity. They typically have weaker and insecure rights to the resources they manage (especially land), and spend longer hours on collection of water, firewood, etc. (OECD, 2006). Women are also more often excluded from other social, economic, and political development processes.

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT	
4.4 Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	No
4.5 Have there been challenges in engaging women and other certain key groups of stakeholders in the project design process?	No
4.6 Will the project have specific human rights implications for vulnerable groups?	No
5. Demographics	
5.1 Is the project likely to result in a substantial influx of people into the affected community(ies)?	No
5.2 Would the proposed project result in substantial voluntary or involuntary resettlement of populations? *For example, projects with environmental and social benefits (e.g. protected areas, climate change adaptation) that impact human settlements, and certain disadvantaged groups within these settlements in particular.*	No
5.3 Would the proposed project lead to significant population density increase which could affect the environmental and social sustainability of the project? *For example, a project aiming at financing tourism infrastructure in a specific area (e.g. coastal zone, mountain) could lead to significant population density increase which could have serious environmental and social impacts (e.g. destruction of the area's ecology, noise pollution, waste management problems, greater work burden on women).*	No
1. Culture	
6.1 Is the project likely to significantly affect the cultural traditions of affected communities, including gender-based roles?	No
6.2 Will the proposed project result in physical interventions (during construction or implementation) that would affect areas that have known physical or cultural significance to indigenous groups and other communities with settled recognized cultural claims?	No
6.3 Would the proposed project produce a physical "splintering" of a community? *For example, through the construction of a road, powerline, or dam that divides a community.*	No
2. Health and Safety	
7.1 Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? *For example, development projects located within a floodplain or landslide prone area.*	No
7.2 Will the project result in increased health risks as a result of a change in living and working conditions? In particular, will it have the potential to lead to an increase in HIV/AIDS infection?	No
7.3 Will the proposed project require additional health services including testing?	Yes. Labour force at the Merkim site will have blood tests (a standard Occupational Health and Safety, OHS, practice for labour handling chemical contaminants). Same procedure will apply to workforce engaged in operations on soil decontamination once

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT		
		such sites are selected during project implementation, and to PCB re-packaging process
3.	**Socio-Economics**	
8.1	Is the proposed project likely to have impacts that could affect women's and men's ability to use, develop and protect natural resources and other natural capital assets? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their development, livelihoods, and well-being?*	No
8.2	Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	No
8.3	Is the proposed project likely to negatively affect the income levels or employment opportunities of vulnerable groups?	No
9.	**Cumulative and/or Secondary Impacts**	**Answer** (Yes/No/ Not Applicable)
9.1	Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project? *For example, future plans for urban growth, industrial development, transportation infrastructure, etc.*	No
9.2	Would the proposed project result in secondary or consequential development which could lead to environmental and social effects, or would it have potential to generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested land will generate direct environmental and social impacts through the cutting of forest and earthworks associated with construction and potential relocation of inhabitants. These are direct impacts. In addition, however, the new road would likely also bring new commercial and domestic development (houses, shops, businesses). In turn, these will generate indirect impacts. (Sometimes these are termed "secondary" or "consequential" impacts). Or if there are similar developments planned in the same forested area then cumulative impacts need to be considered.*	No

ANNEX A.2: ENVIRONMENTAL AND SOCIAL SCREENING SUMMARY

(to be filled in after Annex A.1 has been completed)

Name of Proposed Project: POPs Legacy Elimination and POPs Release Reduction Project

A. Environmental and Social Screening Outcome

Select from the following:

☐ Category 1. No further action is needed

☐ Category 2. Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

☒ Category 3. Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:

☒ Category 3a: Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b).

☐ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate.

B. Environmental and Social Issues (for projects requiring further environmental and social review and management)

In this section, you should list the key potential environmental and social issues raised by this project. This might include both environmental and social opportunities that could be seized on to strengthen the project, as well as risks that need to be managed. You should use the answers you provided in Table 4.1 as the basis for this summary, as well as any further review and management that is conducted.

The project has been designed for implementation with two implementing agencies – UNDP and UNIDO. As far as UNDP components are concerned, the following issues have been identified in the process:

(-) Merkim POPs Pesticide Stockpile Site: This project component involves the elimination of a large, globally significant, stockpile of POPs pesticides and wastes (3,000 t) all located in a single warehouse. The site is located in a water front urban industrial area occupied by long established petroleum/chemical handling, storage and production facilities relatively remote from residential development. Operationally, project activities will involve the collection, packaging, removal, transportation and ultimate disposal of the POPs as a hazardous waste, likely by high temperature incineration at qualified facilities in Western Europe or if available in Turkey. Additionally, the structure itself will be decontaminated and demolished and the relatively minor surficial contamination around the building on the property contained and removed, with the site being restored to a standard suitable for new industrial development. These residual clean-up waste materials will be transported for disposal locally in licenced engineered landfills designed and approved for the particular level of contamination involved. All operations will be undertaken using rigorous but well established and documented international hazardous waste and dangerous goods management practices and procedures and standards, including those set out by Basel and SC convention and GEF STAP guidelines, and internationally referenced OHS procedures for on-site workers. The project explicitly provides for training and due diligence monitoring of these procedures and practices and at the planning and design stages undertaking an EA and Environmental Management Plan (EMP). The operations would be subject to national and local regulatory site and approvals which in Turkey are generally comparable to those applicable in the EU. The principal environmental issues involved are the potential for fugitive releases associated with the stockpile packaging and site clean-up all of which will be mitigated by well-established containment and operational practice used in the management of hazardous waste. The other like risk might be associated with transport which is again mitigated by adoption of standard controls and practices associated with carriage of dangerous good and provision of robust emergency response as well as tracking practice. No direct social impacts are associated with this operation and public consultation in the local community is provided for.

(-) PCB Stockpile Management: This project component involves the packaging, transport, environmentally sound destruction and decontamination of useable metals for recycling of up to 500 t of PCB containing equipment, principally

transformers containing PCB based dielectric oils. These will be collected from two large industrial sites (integrated steel mills) and transported for processing outside the country, likely in Western Europe. As described above operationally this work will be undertaken by qualified, experienced service providers contracted by UNDP using specifications requiring current international standards and with substantive due diligence oversight and supervision including rigorous tracking of the material from source through to final destruction and residual disposition. While less prevalent due to the controlled nature of present stockpile sites, any environmental risks are similar to those described above with the same mitigation applying. No direct social impacts would be associated with the component.

(-) Qualification of National POPs Destruction Facilities: This project component provides for supporting qualification testing, incremental facilities upgrading in one case and evaluation of two modern high temperature incineration facilities to destroy halogenated hazardous waste generally and specifically POPs pesticides and PCBs. One facility (Izaydas) is an existing fully licensed facility established under the national regulatory system that is considered equivalent to that applied in the EU, inclusive of the EIA procedures and rigorous regular emission monitoring. The project supported work involves undertaking test burns using international procedures and standards such that the facilities scope of operation can be extended to POPs wastes. This will involve assessment of any increment critical emission impacts, particularly PCDD/F. on the surrounding area, noting that an extensive baseline for this already exists. In terms of social impacts and issues the project recognizes that while located relatively remotely from residential development the facility is located in a region of high industrialization and cumulative impacts with associated local population concerns exists. As a result, the project provides for extensive public consultation in partnership with the enterprise and local municipal government. The second facility (MESS) to be so qualified is under development and is just completing the formal EIA and licencing process applicable to a new development. It is relatively remotely located in an industrial area (coal mine site) with a significant buffer as appropriate to such a facility. The project activities are essentially as described above for Izaydas.

(-) Contaminated Sites Management: This project component is supporting a major national environmental policy and regulatory initiative to establish a national system addressing contaminated site legacies. This is based on a recently established regulatory regime modelled primarily after the approach used in the EU and considered to be fully harmonized with EU approaches. For actions on individual sites which are not yet specifically selected, the process of site assessment would address environmental and social impacts on a case by case basis under these regulations which would explicitly include a process of staged assessment, risk assessment of a baseline situation and options for clean-up and resulting determination of appropriate land use based clean-up standards, all using current internationally accepted procedures and practice. The project expressly focuses GEF resources in these aspects and on inclusion of public consultation and where applicable social implications.

Minor climate change risks may be associated with the project largely though fossil fuel consumption associated with its physical implementation including a significant materials handling and transportation element, and its use of high temperature incineration or other thermal or moderately high energy consumption processes for the treatment and destruction of POPs pesticides and wastes. However, these are small considering the future climate impact of these contaminants becoming more widely distributed in the environment and then much large volumes of contaminated material having to be captured and treated.

C. Next Steps (for projects requiring further environmental and social review and management):

In this section, you should summarize actions that will be taken to deal with the above-listed issues. If your project has Category 2 or 3 components, then appropriate next steps will likely involve further environmental and social review and management, and the outcomes of this work should also be summarized here. Relevant guidance should be obtained from Section 7 for Category 2, and Section 8 for Category 3.

ESSP covers only UNDP components, which are described above along with the approach to mitigation of impacts where they could exist. This is further elaborated below:

(1) Merkim POPs Pesticide Stockpile Site: An environmental assessment (EA) and environmental management plan (EMP) will be developed for the Merkim stockpile work as part of the initial detailed design and planning stage. This will cover the design of operational containment (as described conceptually in the PD), the sequencing of work, subsequent building decontamination and demolition and its follow-up clean-up, including land decontamination and restoration to industrial standards. This process will adhere to internationally accepted standards and include risk assessment as required and will meet national and international

requirements. It will be undertaken by a competitively selected internationally qualified hazardous waste management service provider, likely in partnership with a national company. The project will also provide direct onsite training.

(2) PCB Stockpile Management: As indicated in the previous section, actions for this project component will follow a well established international practice for the handling, packaging, transport and destruction of PCB based equipment and generally be similar to that described for the POPs pesticide stockpile management.

(3) Qualification of National POPs Destruction Facilities: Next steps and the process of qualification of HTI (high temperature incineration) facilities for POPs destruction is described in detail in the PD and above. Evaluation of the impacts, if any is essentially the focus of the work undertaken by the project and include public consultation and acceptance measures.

(4) Contaminated Sites Management: Once a programme on demonstration of land decontamination is properly set-up, detailed site assessment and clean up design of participating sites will be undertaken with the intention of designing remediation/clean-up options, and will inform the national legislation on applicable international standards and step-wise approach when such activities are implemented in future.

For all components, capacity building and training programmes will ensure the provision of internationally available expertise and advisory support, and specifically to local personnel involved in direct work on project sites. The scope of trainings will cover hazardous waste and contaminated sites management.

Environmental and health risk assessment methodologies and practices applicable to hazardous waste stockpiles, contaminated sites will be developed; relevant technical guidelines on operational safety procedures for hazardous chemicals waste handling, transport, storage and disposal in accordance with international practice will be adopted.

The project also involves contracting of qualified hazardous waste management companies for the export and high temperature incineration in certified EU-based hazardous waste plants. This will be processed through a tendering process according to existing accumulated experience in several other programmes of this type and in line with applicable UNDP procedures.

D. Sign Off

Project Manager **Date**

PAC **Date**

Programme Manager **Katalin Zaim** **Date August 8 2014**

Annex G. GEF POPs tracking tool

Attached separately at submission time in Excel

Annex H: List of identified PCB Equipment to be phased out and available to be eliminated under the Component 1.2

Inventory Label no	Status/ Replacement*	Power Rating (KVA)	Date of manufacture	Manufacturer	Dielectric Oil trade name	Oil Weight (kg)	Transformer Weight (kg)	Total weight (kg)	Transformer replacement Cost (€)	Removal/ Installation Cost (€)
ERDEMİR Stand-by PCB Based Transformers Units in Storage										
3	Standby/2014	2500	1964	WESTINGHOUSE	İNERTEEN	2413	6123	8536	65,000	3,500
4	Standby/2014	2500	1964	WESTINGHOUSE	İNERTEEN	2413	6123	8536	65,000	3,500
5	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	855	1435	2290	23,000	2,500
6	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1360	2586	3946	23,000	2,500
14	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1496	2540	4036	38,000	2,500
15	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1496	2766	4262	38,000	2,500
48	Standby/2014	3000	1964	WESTINGHOUSE	İNERTEEN	5124	8413	13537	65,000	3,500
49	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1491	2545	4036	23,000	2,500
50	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1496	2540	4036	23,000	2,500
72	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	997	2359	3356	32,500	2,500
73	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	997	2359	3356	32,500	2,500
74	Standby/2014	1275	1977	GENERAL ELECTRIC	PYRANOL	7529	5330	12859	32,500	2,500
78	Standby/2014	5000	1977	GENERAL ELECTRIC	PYRANOL	6418	11980	18398	65,000	2,500
79	Standby/2014	833	1977	NIAGARA	ASKAREL	637	4124	4761	27,000	2,500
80	Standby/2014	800	1977	AEG	KLOFEN	1090	2500	3590	27,000	2,500
81	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1496	2540	4036	41,825	2,500
82	Standby/2014	1000	1978	WESTINGHOUSE	İNERTEEN	1587	3174	4761	23,000	2,500
83	Standby/2014	3750	1964	WESTINGHOUSE	İNERTEEN	7029	9751	16780	70,000	3,500
84	Standby/2014	3000	1964	WESTINGHOUSE	İNERTEEN	5124	8413	13537	70,000	3,500
85	Standby/2014	3750	1990	WESTINGHOUSE	İNERTEEN	2477	6559	9036	70,000	3,500
86	Standby/2014	1000	1964	STANDART	ASKAREL	757	2984	3741	38,000	2,500
87	Standby/2014	1500	1964	WESTINGHOUSE	İNERTEEN	2482	3600	6082	22,825	2,500
88	Standby/2014	1500	1964	WESTINGHOUSE	İNERTEEN	1542	3901	5443	22,825	2,500
89	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	3136	3402	6538	22,825	2,500
90	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	3136	3402	6538	22,825	2,500
91	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	2539	3402	5941	22,825	2,500
92	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	2539	3402	5941	22,825	2,500
93	Standby/2014	1000	1964	WESTINGHOUSE	İNERTEEN	1542	3175	4717	22,825	2,500
94	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1496	2540	4036	41,825	2,500
95	Standby/2014	750	1964	WESTINGHOUSE	İNERTEEN	1292	2585	3877	20,000	2,500
96	Standby/2014	833	1964	WESTINGHOUSE	İNERTEEN	1496	1978	3474	18,000	2,500

Inventory Label no	Status/ Replacement*	Power Rating (KVA)	Date of manufacture	Manufacturer	Dielectric Oil trade name	Oil Weight (kg)	Transformer Weight (kg)	Total weight (kg)	Transformer replacement Cost (€)	Removal/ Installation Cost (€)
97	Standby/2014	225	1964	WESTINGHOUSE	İNERTEEN	1632	1633	3265	18,000	2,500
98	Standby/2014	5000	1977	GENERAL ELECTRIC	PYRANOL	6417	11981	18398	41,825	4,000
99	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	997	2359	3356	41,825	2,500
100	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	997	2359	3356	41,825	2,500
101	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	997	2359	3356	41,825	2,500
102	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	998	2359	3357	41,825	2,500
103	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	999	2359	3358	41,825	2,500
104	Standby/2014	1000	1977	GENERAL ELECTRIC	PYRANOL	1000	2359	3359	41,825	2,500
105	Standby/2014	1000	1964	GENERAL ELECTRIC	İNERTEEN	1337	363	1700	40,000	2,500
106	Standby/2014	2000	1974	EVM	İNERTEEN	2494	4019	6513	65,000	2,500
108	Standby/2014	2000	1964	WESTINGHOUSE	İNERTEEN	2496	3991	6485	50,000	2,500
109	Standby/2014	2500	1964	ALLIS-CHALMERS	ASKAREL	2034	4451	6485	50,000	2,500
Sub-Total ERDEMİR Stand-by PCB Based Transformers Units in Storage						97,880	169,123	267,001	1,662,700	115,000
ERDEMİR PCB Based Transformers Units in Service and Scheduled for Replacement										
1	in use/ 2014	750	1964	WESTINGHOUSE	İNERTEEN	1378	2949	4327	23000	2500
2	in use/ 2014	750	1964	WESTINGHOUSE	İNERTEEN	1383	2948	4331	23000	2500
7	in use/2014	2500	1964	WESTINGHOUSE	İNERTEEN	2413	6123	8536	50,000	3,500
8	in use/2014	2000	1964	WESTINGHOUSE	İNERTEEN	2413	6123	8536	50,000	3,500
9	in use/ 2014	750	1964	WESTINGHOUSE	İNERTEEN	1020	2150	3170	23000	2500
10	in use/ 2014	750	1964	WESTINGHOUSE	İNERTEEN	1315	1678	2993	23000	2500
18	in use/ 2014	1600	1977	AEG	TECHNOL	1945	4265	6210	22825	2500
20	in use/ 2014	750	1973	AEG	KLOFEN	1040	2510	3550	23000	2500
21	in use/ 2014	750	1973	AEG	KLOFEN	1040	2510	3550	23000	2500
27	in use/ 2014	1000	1964	WESTINGHOUSE	İNERTEEN	1587	3175	4762	40000	2500
28	in use/ 2014	1000	1964	STANDART	ASKAREL	946	2796	3742	40000	2500
32	in use/ 2014	1000	1977	WESTINGHOUSE	İNERTEEN	1173	2437	3610	40000	2500
33	in use/ 2014	1000	1977	WESTINGHOUSE	İNERTEEN	1173	2446	3619	40000	2500
45	in use/ 2014	800	1975	BRUSH	PYRANOL	905	3015	3920	23000	2500
54	in use/ 2014	750	1964	WESTINGHOUSE	İNERTEEN	1184	1986	3170	23000	2500
55	in use/ 2014	1000	1964	WESTINGHOUSE	İNERTEEN	1403	2465	3868	40000	2500
56	in use/ 2014	1000	1964	WESTINGHOUSE	İNERTEEN	1403	2465	3868	40000	2500
68	in use/ 2014	1000	1964	WESTINGHOUSE	İNERTEEN	1333	3084	4417	40000	2500
16	in use/ 2015	891	1964	WESTINGHOUSE	İNERTEEN	1723	3174	4897	23000	2500

Inventory Label no	Status/ Replacement*	Power Rating (KVA)	Date of manufacture	Manufacturer	Dielectric Oil trade name	Oil Weight (kg)	Transformer Weight (kg)	Total weight (kg)	Transformer replacement Cost (€)	Removal/ Installation Cost (€)
17	in use/ 2015	891	1964	WESTINGHOUSE	İNERTEEN	1709	3175	4884	23000	2500
19	in use/ 2015	750	1973	AEG	KLOFEN	1040	2510	3550	23000	2500
22	in use/ 2015	750	1973	AEG	KLOFEN	1040	2510	3550	23000	2500
26	in use/ 2015	5000	1964	WESTINGHOUSE	İNERTEEN	6418	11984	18402	42000	4000
44	in use/ 2015	2000	1964	WESTINGHOUSE	İNERTEEN	2122	5283	7405	65000	2500
46	in use/ 2015	597	1964	WESTINGHOUSE	İNERTEEN	1247	2494	3741	23000	2500
47	in use/ 2015	1000	1964	WESTINGHOUSE	İNERTEEN	1383	3356	4739	40,000	2500
59	in use/ 2015	7500	1964	WESTINGHOUSE	İNERTEEN	9115	15510	24625	65000	4000
35	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1006	1928	2934	23000	2500
36	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1006	1928	2934	23000	2500
57	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1496	2495	3991	23000	2500
58	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1496	2495	3991	23000	2500
65	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1315	2585	3900	23000	2500
66	in use/ 2016	750	1964	WESTINGHOUSE	İNERTEEN	1315	2585	3900	23000	2500
67	in use/ 2016	891	1964	WESTINGHOUSE	İNERTEEN	1587	3039	4626	23000	2500
11	in use/ 2017	3750	1964	WESTINGHOUSE	İNERTEEN	7074	9750	16824	65,000	4000
12	in use/ 2017	1000	1964	WESTINGHOUSE	İNERTEEN	1338	3084	4422	40000	2500
13	in use/ 2017	1000	1964	WESTINGHOUSE	İNERTEEN	1338	3084	4422	40000	2500
52	in use/ 2017	3750	1964	WESTINGHOUSE	İNERTEEN	4307	7193	11500	65000	4000
Sub-Total - ERDEMİR PCB Based Transformers in Service Scheduled for Replacement						74,129	145,287	219,416	1,284,825	103,000
Total - ERDEMİR PCB Based Transformers Replaced or Scheduled for Replacement						172,009	314,410	486,417	2,947,525 (US$4,126,535)	218,000 (US$305,200)

*Schedule for replacement indicative and may vary depending on operating conditions year to year

No. of Units	Status/ Replacement	Power Rating (KVA)	Manufacturer	Dielectric Oil trade name	Total weight (kg)	Unit replacement Cost (€)	Removal/ Installation Cost (€)
ISDEMİR Stand-by and In-Serve PCB Based Transformers and Capacitors Scheduled for Replacement							
2 units	In Use/2014-17	355	YTM	Sovtol	7,000	50,847	5,000
274 units	261 -In Use/2014-17 13 – Standby/ 2014-17	3.64	VEB Isokond	Confirmed PCB based	13,700	185,763	30,000
Total - ISDEMİR PCB Based Equipment Transformers Replaced or Scheduled for Replacement					20,700	236,610 (US$330,400)	35,000 (US$49,000)

Annex I. Indicative Project Implementation Schedule

Project Component/Outcome/Activity (Output)	2014		2015				2016				2017				2018			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Government review/ preliminary endorsement																		
Project Document Implementing Agency clearances																		
GEF CEO submission/endorsement																		
Final government endorsement																		
Project implementation organization established																		
Inception Phase planning/workshop																		
Mid-Term Review																		
Final Term Evaluation report																		
Component 1: Elimination of Current POPs Stockpiles and Wastes																		
Outcome 1.1 Elimination and infrastructure removal from remaining POPs pesticide storage sites																		
1.1.1 Detailed site assessment operational planning, EIA and tender documents for Merkim site POPs pesticide stockpile																		
1.1.2 Removal and destruction of Merkim POPs pesticides and waste.																		
1.1.3 Demolition, removal and disposal of Merkim site infrastructure																		
1.1.4 Remediation of the Merkim site.																		
1.1.5 Supporting Training.																		
1.1.6 Supporting Public Awareness and Consultation																		
1.1.7 Obsolete pesticide stockpiles elimination																		
Outcome 1.2: Elimination of high concentration PCBs and PCB containing equipment stockpiles																		
1.2.1 Packaging, transport and disposal of available PCB stockpiles																		
Outcome 1.3: Qualification of existing and developing national POPs destruction facilities.																		
1.3.1 Facility Upgrades at İZAYDAŞ																		
1.3.2 Test burns at İZAYDAŞ																		
1.3.3 Supporting public consultation																		
1.3.4 Test burns at MESS																		
1.3.5 Supporting public consultation																		
Component 2: Planning and Capacity Building for Environmentally Sound Management of Future PCB Stockpiles																		
Outcome 2.1: Implementation of national PCB regulation																		
2.1.1 Technical annex and guidance documents to the existing PCB regulation developed and implemented.																		

Project Component/Outcome/Activity (Output)	2014		2015				2016				2017				2018			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.1.2 Capacity of the relevant authority for monitoring, measuring and reporting the implementation of the existing PCB regulation enhanced.																		
Outcome 2.2: Systematic approach for the analytical determination of PCB in electrical equipment, labelling and inventory.																		
2.2.1 Training on PCB equipment identification and labelling.																		
2.2.2 Sampling and analysis of at least 8,000 transformers in-use or stored for maintenance for checking their contamination by PCBs.																		
2.2.3. Update of the existing PCB inventory and identification of PCB containing equipment from 50 to 500 ppm and greater than 500 ppm as required by the SC																		
Outcome 2.3: Development and adoption of national PCB equipment treatment, phase out and retirement plan																		
2.3.1 Consultation with the main stakeholders from the power generation and distribution sector and large electricity customers to identify PCB management plan priorities and develop the PCB management plan.																		
2.3.2 Promotion of adoption and development of an implementation strategy for the PCB management plan																		
Outcome 2.4: : Improvement of storage and maintenance of cross contaminated PCB equipment																		
2.4.1. Standards and Guidance Documents for prioritizing, maintenance, handling and storage of PCB contaminated equipment in use or under maintenance.																		
2.4.2. Adoption of physical or operational measures for preventing release of PCB or human exposure to PCB from equipment on-line, in use or under maintenance.																		
Outcome 2.5: Verification of decontamination technology for PCB contaminated transformers remaining in service and demonstrating it on a pilot basis.																		
2.5.1 Verification of technological options for the treatment of on-line or stored transformers for maintenance.																		
2.5.2 Selection, procurement and testing of equipment for the treatment of PCB contaminated transformers.																		
2.5.3 Pilot demonstration of the treatment of PCB contaminated equipment																		
Component 3: Unintended POPs Release Reduction																		
Outcome 3.1: Determination and verification on an enterprise level of source and technology specific U-POPs emissions																		
3.1.1 Determination of current PCDD/F emission factors in the iron and steel sector – sintering plants and/or EAF, non-ferrous metal industry (aluminum, copper and zinc production) and other priority sectors																		
3.1.2 Training on PCDD/F sampling and analysis at industrial stacks																		
Outcome 3.2: Provision of training and technical assistance on BAT/BEP for priority industrial sectors																		
3.2.1 Training on U-POPs inventory, sampling and analysis																		
3.2.2 Training of at least 50 technical professionals on BAT-BEPs in 10 priority industrial sectors																		

Project Component/Outcome/Activity (Output)	2014		2015				2016				2017				2018			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Outcome 3.3: Development of a national U-POPs release reduction plan																		
3.3.1 Assessment of the regulatory gaps with reference to SC requirement and EU-IPPC regulation and proposed amendments																		
3.3.2 Identification of areas with the highest priorities and cost/effectiveness in term of U-POPs reduction																		
3.3.3 Development of the national U-POPs release reduction plan with risk-based and cost/effectiveness priorities.																		
Outcome 3.4: Demonstration of BAT/BEP in industrial priority source categories																		
3.4.1.a. Demonstration – assessment of BAT/BEP in the iron and steel sector (sintering plants)																		
3.4.1.b. Demonstration – assessment of BAT/BEP in the iron and steel sector (Electric arc furnaces)																		
3.4.1.c. Demonstration – assessment of BAT/BEP in non-feeous metals sector (copper, zinc, aluminium)																		
Component 4: Management Capacity for POPs Contaminated Sites																		
Outcome 4.1: Implementation of the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"																		
4.1.1: Technical support provided for implementation and administration of the three primary systems under the regulation																		
4.1.2 Technical support in developing mechanisms for financing contaminated site clean-up under the regulations																		
4.1.3 Stakeholder awareness and support in regulation and associated component system delivered																		
4.1.4.a Training program development and delivery for site assessment including application of risk assessment																		
4.2.4.b Training program development and delivery for remediation technology demonstration and selection																		
Outcome 4.2: Undertaking priority POPs contaminated sites assessments and clean up measures under the "Soil Pollution Control and Point-Source-Contaminated Sites Regulation"																		
4.2.1: Funding initial site assessment, clean up design and technology option analysis for prioritized regulatory action																		
4.2.2: Undertaking demonstration contaminated site clean ups																		
Component 5: Institutional and Regulatory Capacity Strengthening for POPs and Sound Chemicals Management																		
Outcome 5.1: Legislative framework updated and adopted consistent with Convention obligations adopted																		
5.1.1 Harmonization of POPs related legislation and regulation with current SC obligations and relevent EU Directives.																		

Project Component/Outcome/Activity (Output)	2014		2015				2016				2017				2018			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
5.1.2 Implementation of Rotterdam Convention supported through enabling activities.																		
5.1.3 Identify national capacities and potential cooperation for POPs and chemicals management and develop a national POPs and chemicals waste management capacity needs assessment.																		
Outcome 5.2: Strengthened technical capacity- including operational POPs monitoring, supporting analytical capability, and planning related research and development capability																		
5.2.1 Operational POPs monitoring and participation in the Global POPs network																		
5.2.2 Qualification undertaken with additional laboratories for regulatory purposes related to POPS and and contaminated sites activities.																		
Outcome 5.3 Development and implementation of modern tools for a national sound chemicals management framework																		
5.3.1 Delivered training on sound chemicals management to 200 institutional and industry professionals and stakeholders																		
5.3.2 Delivered general chemicals management awareness materials to the general public in the form of information products and public events																		

Annex J. Direct Project Cost Agreement

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE MINISTRY OF ENVIRONMENT AND URBANISM OF THE REPUBLIC OF TURKEY FOR PROVISION OF SUPPORT SERVICES

Dear Mr. Kesimal,

1. Reference is made to consultations between officials of the Ministry of Environment and Urbanism of the Republic of Turkey (hereinafter referred to as "Ministry") and officials of UNDP Turkey hereinafter referred to as UNDP with respect to the provision of support services by the UNDP Turkey country office for nationally managed project "POPs Legacy Elimination and POPs Release Reduction Project" **(Hereinafter referred to as Project).** UNDP and the Ministry hereby agree that the UNDP country office may provide such support services at the request of the Ministry through its institution designated in the relevant project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Ministry -designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the project:

a) Identification and recruitment of project and programme personnel;
b) Identification and facilitation of training activities;
c) Procurement of goods and services.

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a project, the annex to the project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the Standard basic agreement between UNDP and the Government of Turkey signed on 21 October 1965 (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed project through the Ministry as its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between the Ministry and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed projects.

Yours sincerely,

_____	_____
Signed on behalf of UNDP	For the Ministry of Environment and Urbanism of the Republic of Turkey
Matilda Dimovska	Mr. Yahya Kesimal,
UNDP Resident Representative in Turkey, a.i.	

Head of Department of the Ministry of Environment and Urbanism of
the Republic of Turkey

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between the Ministry of Environment and Urbanisms, the institution designated by the Government of Turkey and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed GEF funded project "POPs Legacy Elimination and POPs Release Reduction Project"

2. In accordance with the provisions of the letter of agreement signed on 12 September 2014 and the project document, the UNDP country office shall provide support services for the project "POPs Legacy Elimination and POPs Release Reduction Project" as described below.

3. Support services to be provided:

Support Services	Total Cost to UNDP	Method of Reimbursement of UNDP
1. Procurement Support	$22,000.00	DPC & Billing
2. Finance and Resource Management Oversight	$14,000.00	DPC & Billing
3. HR and Administrative Support	$12,000.00	DPC & Billing
Total:	**$48,000.00**	

4. Description of functions and responsibilities:

UNDP country office support services to national execution:

1. Recruitment of Project personnel:
    - Assist in conducting search for suitable candidates (advertisement, website, roster)
    - Assist in preparing TORs
    - Involve in interviewing candidates
    - Assist in issuing contracts
    - Authorizing salary/consultancy fee/missions
    - Assess performance
2. Sub – contracting/Procurement
    - Assist in identifying suitable subcontractors (advertisement, website, posters)
    - Assist in preparing TORs
    - Assist in evaluating TORs
    - Assist in evaluation bids
    - Assist in issuing contracts (when necessary)
    - Assess sub – contractors work
    - Ensure inputs as per contracts TOR's
    - Ensure payments are made accordingly
    - Ensure milestones are met
    - Critical review of sub – contractors performance
3. Financial Management and Accountability
    - Making direct payments and ensuring flow of funds for project activities
    - Training of staff of implementing agency on financial disbursement and reporting
    - Financial monitoring and record keeping
    - Financial reporting
    - Budget revisions
    - NEX Audit exercise
4. Training/Workshops
    - Making appropriate arrangements for the logistical and technical support of the training and workshop activities
5. Equipment
    - Review specifications
    - Identify suppliers of goods and services
    - Approve specifications
    - Assist in evaluating contracts
    - Assist in awarding contracts (when necessary)
    - Undertake Customs clearance
    - Authorize payments.