Ministry of Environment and Water

REPUBLIC of BULGARIA

NATIONAL IMPLEMENTATION PLAN FOR THE MANAGEMENT OF PERSISTENT ORGANIC POLLUTANTS (POP's) IN THE REPUBLIC OF BULGARIA

UNEP CHEMICALS GEF

PROJECT GF/2732 02 - 4454





National Implementation Body & Coordinator - Ministry of Environment and Water
Sofia, March 2006

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First Edition, 2006

D E C I S I O N

dated 23th of March 2006
of the National Coordinating Committee (NCC) under Bulgarian GF/2732-02-4454 project

The members of the National Coordinating Committee (NCC), coordinating and assisting the development of Bulgarian GF/2732-02-4454 project „National Implementation Plan (NIP) for the management of Persistent Organic Pollutants(POPs) in the Republic of Bulgaria":

Recognizing that persistent organic pollutants possess toxic properties, resist degradation, bioaccumulate and are transported, through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems,

Aware of the human health concerns, especially in the regions with potential for formation and release of these chemicals to the environment, resulting from the negative effects of persistent organic pollutants, in particular impacts upon women and, through them, upon future generations,

Recognizing the important contribution that the private sector and non-governmental organizations can make to achieving the reduction and/or elimination of emissions and discharges of persistent organic pollutants,

Conscious of the need to take measures to prevent adverse effects caused by persistent organic

pollutants at all stages of their life cycle,

Recognizing the importance of developing and using environmentally sound alternative processes and chemicals,

Determined to protect human health and the environment from the harmful impacts of persistent organic pollutants,

Have considered on its meeting on 23 March 2006 the final draft of the National Implementation Plan (NIP)for the management of Persistent Organic Pollutants(POPs) in the Republic of Bulgaria"and have agreed the following

D E C I S I O N:

The National Coordinating Committee (NCC) approves and endorses the final draft of the National Implementation Plan (NIP)for the management of Persistent Organic Pollutants(POPs) in the Republic of Bulgaria".

The endorsed NIP includes a set of measures which implementation shall allow safe storage of POPs and obsolete pesticides stockpiles, gradually phasing out of PCBs equipment and the reduction of unintentional production of POPs releases derived by different industrial sectors.
The successful implementation of the present NIP by responsible authorities and institutions will prepare Bulgaria to meet its obligations set under the Stockholm Convention on POPs.

National Coordinator
Bulgarian GF/2732-02-4454 project
(Prof. Georgi Antov, PhD, DMSci.)

MINISTER of Ministry of Environment and Water
and Chairman of NCC and Project Manager:
(DR. DZHEVDET CHAKAROV)

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This publication is a result of a collaborative effort and was prepared during the development of the UNEP/GEF Bulgarian Sub Project GF/2732-02-4454 „Development of National Implementation plan (NIP) for the management of Persistent Organic Pollutants (POPs) in the Republic of Bulgaria" under the provisions of the Stockholm Convention on Persistent Organic Pollutants (POPs) with the support of the Ministry of Environment and Water of the Republic of Bulgaria experts, National Coordinating Commette members, international and national experts.

That document was developed due to the contribution and support of all listed persons, members of the National Co-ordination Committee, Representatives of interested institutions, ministries, universities, organizations, NGOs and national experts.

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Ministry of Environment and Water of the Republic of Bulgaria

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LIST OF ABBREVIATIONS

ABEITR	Association of the Bulgarian Enterprises for International Transport and Roads
ADI	Acceptable Daily Intake
BAS	Bulgarian Academy of Sciences
B-B Cube	a reinforced concrete container for storage of hazardous substances
BCC	Bulgarian Chamber of Commerce
BCCI	Bulgarian Chamber of Chemical Industry – non-governmental organisation
BCCI	Bulgarian Chamber of Commerce and Industry
BD	Basin Directorate
BSECEE	Balkan Science and Education Centre of Ecology and Environment
CEFIC	European Chemical Industry Council
CPSA	Civil Protection State Agency
DDD/DDE	Metabolites of DDT
DDT	Dichlorodiphenyltrichloroethane
DLPCBs	Dioxin-like PCBs
EA BAS	Executive Agency Bulgarian Accreditation Service
EAGLI	Executive Agency of the General Labour Inspectorate.
EC	European Commission
EEA	European Environmental Agency.
EEA	Executive Environment Agency.
EIA	Environmental Impact Assessment
ESM	Environmentally sound management
EMEP	Co-operative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe
EU	European Union
FAO	Food and Agriculture Organisation of the Unated Nations
GEF	Global Environment Facility
GDC	General Directorate „Customs"
GVA	Gross Value Added
GDP	Gross Domestic Product
HCB	Hexachlorbenzene
HEF	Higher Education Facility
IAC	Interagency Committee
IACEE	Inter-agency Council of Environmental Experts
IARC	International Agency for Research on Cancer
IERS	International Emergency Response System
IHE	(RIPHPC) Institute of Hygiene and Epidemiology (Regional Inspectorate for Public Health Protection and Control).
IPPC	Integrated Pollution Prevention and Control
I-TEQ	International Toxicity Equivalence
K_{AW}	Air/Water Partition Coefficient
K_{OW}	Octanol/ Water Partition Coefficient
LD_{50}	Median Lethal Dose
LRTAP	Long Range Transport Air Pollutants
MDL	Minimum Detectable Level
MRL	Maximum Residue Limit
MoAF	Ministry of Agriculture and Forestry
MoCT	Ministry of Culture and Tourism
MoD	Ministry of Defence
MoEE	Ministry of Economy and Energy
MoEER	Ministry of Energy and Energy Resources
MoEW	Ministry of Environment and Water
MoF	Ministry of Finance
MoH	Ministry of Health

LIST OF ABBREVIATIONS

MoI	Ministry of Interior
MoLSP	Ministry of Labour and Social Policy
MoTC	Ministry of Transport and Communications
MPATH	Multi-Profile Active Treatment Hospital.
NCHMEN	National Centre for Hygiene, Medical Ecology, and Nutrition
NCPHP	National Centre for Public Health Protection
NCRRP	National Centre for Radiology and Radiation Protection
NEPF	National Environment Protection Fund at the MoEW
NESAP	National Environmental Strategy and Action Plan
NGOs	Non-Governmental Organisations
NHIC	National Health Information Centre
NHIF	National Health Insurance Fund
NIMS	National Institute for Medicinal Substances
NIS	National Institute of Statistics.
NPP	Nuclear Power Plant
NPPS	National Plant Protection Service
NRA	Nuclear Regulation Agency
NROD	National Register of Occupational Diseases
NSFES	National Service for Fire and Emergency Safety
OMO	Occupational Medicine Office
PCBs	Polychlorinated Biphenyls
PCDDs	Polychlorinated Dibenzodioxins
PCDFs	Polychlorinated Dibenzofurans
PCPPCE	Permanent Commission for Protection of the Population during Calamities and Emergencies
PCPPCEC	Permanent Commission for Protection of the Population during Calamities and Emergencies and Catastrophes
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants, as defined in the Stockholm Convention.
PPCA	Post-Privatisation Control Agency
REACH	Registration, Evaluation and Authorisation of Chemicals
RHC	Regional Healthcare Centre
RIEW	Regional Inspectorate of Environment and Water
SAICM	Strategic Aproach to International Chemicals Management
SCEE	Supreme Council of Environmental Experts
SMSA	Standardisation and Metrology State Agency
SNCC	State National Construction Control
TEQ	Toxicity Equivalents
TP	Traffic Police
TPP	Thermal Power Plant
UNEP	Unated Nations Environment Programme
UNIDO	Unated Nations Industrial Development Organisation
WHO	World Health Organisation

EXECUTIVE SUMMARY

1. INTRODUCTION

The aim of the Stockholm Convention is to protect human health and the environment from Persistent Organic Pollutants (POPs) impacts. POPs possess toxic properties, resist degradation, bioaccumulate and are transported, through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems. **Annex A, B & C list 12 Persistent Organic Pollutants (POPs)** – the POPs pesticides (aldrin, dieldrin, endrin, mirex, toxaphene, hexachlorbenzene, heptachlor, chlordane and DDT), the industrial chemicals – polychlorinated biphenyls (PCBs) and the POPs chemicals, formed and released unintentionally from anthropogenic sources (Polychlorinated dibenzo-p-dioxins and dibenzofurans - PCDD/PCDF, Hexachlorobenzene - HCB and Polychlorinated biphenyls - PCBs).

The Republic of Bulgaria signed the Stockholm Convention on POPs on 23 May 2001 at the Conference of Plenipotentiaries held in Stockholm, Sweden. On 30 September 2004, the Convention was ratified with a Law by the National Assembly (SG No. 89/ 12.10.2004). and it is effective for Bulgaria from 20 March 2005.

With funds granted by GEF (Global environmental facility) and with the assistance of the United Nations Environment Programme the Ministry of Environment and Water, Bulgaria has developed the present National Implementation Plan for the management of POPs (NIP) drawn up under sub-project GF/2732-02-4454 within the frame of Global Project GEF/UNEP: GF/2732-02-4452 „Development Of National Implementation Plans for the management of Persistent Organic Pollutants (POPs)" for twelve pilot countries. The NIP preparation took 4 years and all the activities were coordinated by a National Coordinating Committee (NCC), appointed by the Bulgarian Project Manager. A number of experts, representatives from interested institutions, ministries, universities, organizations, NGOs, etc., included in the NCC took part actively within the process of formulating and development of Bulgarian NIP for POPs.

The present National Implementation Plan for the management of POPs in Bulgaria is developed on the basis of the requirements of Article 7 of Stockholm convention. Bulgaria shall transmit its implementation plan to the Conference of the Parties within two years of the date on which the Convention enters into force for it, i.e. until 20 March 2007.

The NIP includes a set of measures which implementation shall allow safe storage of POPs and obsolete pesticides stockpiles, gradually phasing out of PCBs equipment and the reduction of unintentional production of POPs releases derived by different industrial sectors.

Generally the present NIP comprises targeted activities that will prepare Bulgaria to meet its obligations set under the POPs Convention.

The National Implementation Plan for the management of POPs in the Republic of Bulgaria (NIP) comprises two main parts.

The First part of NIP summarises:

1. Country Baseline
2. Assessment of the POPs issue in the country, based on the preliminary POPs inventories.

The Second Part of the NIP **includes:**

1. Strategy and action plan elements of the national implementation plan
2. Implementation strategy
3. Specific Action plans:

- Action plan for POPs Pesticides - Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenxene, Mirex, Toxaphene and DDT;

- Action plan for PCBs in Equipment;

- Action plan for POPs releases from unintentional production (PCDD/PCDFs, PCBs and HCB)

4. Development and capacity-building proposals and priorities
5. Timetable for plan implementation and measures of success
6. Resource requirements preliminary assessment for NIP implementation

The results of the assessment on POPs issues in the country, based on national preliminary POPs Inventory indicate the following:

2. ASSESSMENT OF POPS ISSUE IN R BULGARIA BASED ON INVENTORY RESULTS

2.1.ASSESSMENT WITH RESPECT TO POPS AND OBSOLETE PESTICIDES

POPs pesticides have never been manufactured in the Republic of Bulgaria. Most POPs pesticides have been applied mainly as pest control preparations to treat termites and soil insects. The use of POP pesticides has been largest in the 60s in quantities 100-200 t annually. The import and use of aldrin, dieldrin, endrin and DDT was banned in 1969, toxaphene in 1985 and heptachlor in 1991. Mirex, hexachlorobenzene and hlordane have not been imported and used in the country. **All POPs pesticides are banned for import and use in agriculture.**

Table 1POPs pesticides: Production, import, export and year of ban

POPs Pesticides	Production	Import	Period of Import	Imported Amount, t/y	Export	Year of Ban for import and use
Aldrin	No	Yes	1960-1969	135-200	No	1969
Dieldrin	No	Yes	1960-1969	100	No	1969
Endrin	No	Yes	1960-1969	100	No	1969
Mirex	No	No			No	
Toxaphene	No	Yes	1960-1985	100-150	No	1985
Hexachlorobenzene	No	No			No	
Heptachlor	No	Yes	1960-1990	100	No	1991
Chlordane	No	No			No	
DDT	No	Yes	1950-1965		No	1969

The obsolete and useless pesticides, including POPs are stored in centralized and municipal warehouses and BB cubes (steel-concrete containers with size 195x195x195 cm, hermetically sealed with useful volume 5 m^3).

The available obsolete pesticides stockpiles, including also POPs pesticides and mixtures, consisting of or contaminated with POPs in RBulgaria at the end of 2004 are:

Table 2Available obsolete pesticides stockpiles and assumed POPs pesticides amounts in RBulgaria at the end of 2004

№	Obsolete and useless pesticides stockpiles (OP)	Unit	Quantity
1 .	**OBSOLETE PESTICIDES**		
	Total OP stockpiles in warehouses and BB cubes	t	**11,222**
	In warehouse, including	t	7011
	in 84 centralized warehouses	t	4703
	in 477 unrepaired municipal warehouses	t	2308
	In 1255 BB cubes	t	**4211**
	Total OP stockpiles, stored in safe centralized warehouses, conforming to all requirements and in BB cubes	t	**8914**
2.	**POPs PESTICIDES AND MIXTURES**		
	Total POPs pesticides stockpiles in warehouses, including	t	**52,313**
	POPs pesticides assumed stockpiles, including		**22,255**
	Aldrin	t	1,395
	Dieldrin	t	1,595
	Endrin	t	0,204
	Toxaphene	t	0,720
	Heptachlor	t	7,592
	DDT	t	10,749
	Mixtures of 'unknown' obsolete pesticides, consisting of or contaminated with POPs	t	**30,058**

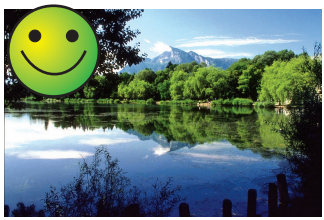
After the ban of POPs pesticides for import and use, the country took measures for their replacement with alternative registered in Bulgaria insecticides, suitable for agricultural application in any specific case.

In August 2000 under the project „Destruction of Risk Pesticides from Bulgaria in the Netherlands", 27680 kg of POP pesticides such as DDT, aldrin and dieldrin from Bulgaria's regions Sofia, Plovdiv, Shumen and Burgas have been exported to Netherlands, and destroyed in an incinerator in Rotterdam.

The assumed POPs pesticides stockpile at the end of 2003 in Bulgaria is in the range 22.25 t - 25.82 t . The obsolete pesticides mixtures, consisting of or contaminated with POPs comprise approx. 30.06 t. These could not be identified because of the absence of labels, torn packages and mixing with other Obsolete pesticides. The assumed total POPs pesticides stockpile is thus between 52.3 t and 55.9 t.

To identify the specific POPs pesticides, contained in 2308 t obsolete 'unknown ' composition, stored in 477 unrepaired municipal warehouses, the implementation of detailed POPs pesticides Inventory is required.

2.1.1. MONITORING



Surface and Ground water

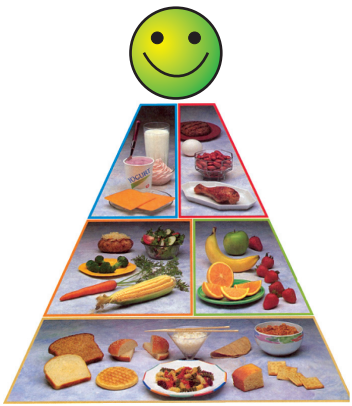
POPs pesticide monitoring indicates excellent condition of surface and groun dwater on the whole territory of the country. During 2003 in R Bulgaria there are no surface and ground water, polluted with POPs pesticides.

Soil

In all studied regions of R Bulgaria no soils polluted with the following POPs pesticides (aldrin, dieldrin, endrin, heptachlor and hexachlorbenzene) exist. DDT and metabolite residues in soils are still registered in the environment of almost all regions of the country. The summarized analytical data show that about 95% of soils in the country are not polluted with DDT.

No new POPs soil pollution levels were recorded in 2003. At all points the measured content of POPs pesticides, PCBs and HCB is considerably below the reference background values and no potential threat exists from POPs soil pollution. Isolated local cases of DDT soil pollution were registered.

The monitoring results show that at this stage the agricultural activities do not result in further soil load. That fact is due on the one hand to the reduced fertilizer and pesticides consumption , but also to the performed programs for environmental-friendly agriculture and biological production.



Food

No presence of any residues of POPs pesticides exceeding the maximum admissible residual concentration (MARC) in the tested 2200 foodstuffs from vegetable and animal origin for the Year 2003 has been detected.

No cases of acute and chronic intoxication with persistent chlororganic pesticides have been registered in the Republic of Bulgaria.

No presence of any residues from POPs pesticides ncluding such as Aldrin, DDT, Heptahlor epoxide and PCBs in the tested samples of Live Animals, Fresh Meat, Poultry, Fish, Farmed & Wild Game, Raw Milk, Hen Eggs and Bee Honey in Bulgaria for the Year 2003 has been detected.

2.1.2. EXISTING POLICY

During the period 2001 - 2004, steady improvements were made in the management and safe storage of banned and obsolete pesticides.

The construction of centralized municipal warehouses and BB cubes conforming to the legislative requirements for safe disposal, liable storage of available obsolete pesticides stockpiles and cleaning up of emptied warehouses are activities that illustrate consistency in environmental protection policy and sustainable management of obsolete pesticides.

The funds allocated by the Enterprise for Management of Environmental Protection Activities (EMEPA) and National Plant Protection Service (NPPS) have been increasing constantly during the period 1998- 2004 for safe storage of obsolete & unusable pesticides, repairing of warehouses, cleaning up of premises and sites, collection, re-packing, and shifting of chemicals from warehouses in the small urban centres to municipal and centralised warehouses, or disposal in BB cubes. The totally allocated funds by EMEPA for safe storage of obsolete pesticides for the period 1998-2005 equals to approx. 7,5 million BGN as only for 2004 the funds are almost 2 millions BGN. The decreasing of old warehouses and the environmentally sound storage of obsolete pesticides has reduced the threat of environmental pollution and human health risk.

Nevertheless the steady positive trends observed during recent years and constantly increased funds allocated by Bulgarian state for the management of POPs and obsolete pesticides, the Republic of Bulgaria can not cope alone with final solving of POPs and Obsolete pesticides stockpiles without international financial support, due to limited national funding available and the fact that Bulgaria is in Currency Board. To reduce the risk of POPs pesticides impacts on human health and the environment measures should be taken for safe storage and/or environmentally sound disposal abroad, due to absence of appropriate disposal facility in the country. For this purpose the Republic of Bulgaria needs to be supported by providing financial resources from GEF and other international, bilateral, regional and multilateral twinning programmes.

2.2.ASSESSMENT WITH RESPECT TO PCBS IN EQUIPMENT

In Bulgaria PCBs were used mainly dielectric fluids in electrical equipment such as transformers and capacitors. The manufacturers of transformers and capacitors in Bulgaria are 5 companies and of transformer and capacitor oils – 6 companies. None of the these manufacturers have never produced equipment and oils, containing PCBs. For the period 1970 г.ч1990 г. in the country totally 1954 transformers have been imported, out of which most likely to contain PCBs are the transformers imported from PCBs manufacturing countries – the USSR, West Germany, East Germany, and Czechoslovakia.

Table 3 Annex A, Part II chemicals: PCBs production, import, export, year of ban in RBulgaria for 2003.

Annex A, Part II Chemicals	Production	Import	Export	Year of Ban
PCBs in equipment and oils	No	Yes 1954 transformers	No	1985

The inventory of equipment (transformers and capacitors) and oils, carried out on the territory of Republic of Bulgaria in 2003, has found out the following.

In 2003 a total of 43644 transformers and 45715 t oils and 17689 capacitors have been inventoried. The preliminary inventory of PCBs in equipment found out the availability of electric equipment, containing PCBs with concentration > 0,05 % by weight and volume > 5 dm^3.

Table 4 Electric equipment with volume > 5 dm^3 and oils, containing PCBs with concentration > 0,05 % and > 0,005 % < 0,05% by weight

Electric equipment	PCBs oils, tones	PCBs equipment number	Remark
In-use transformers with PCBs concentration > 0,05 % by weight and volume > 5 dm^3, including waste and fresh oils	327,2	158	The equipment and oils with PCBs assumed are not included here.
In-use transformers with PCBs concentration > 0,005 % by weight and < 0,05 % by weight and volume > 5 dm^3	1642,1	41	Only the amount of oils, containing PCBs had been identified, but not the weight of contaminated equipment
Capacitors, containing PCBs, including in-use, phased-out and spare equipment	7,9	2415	
Total oils/equipment, containing PCBs	**1977,2**	**2614**	

Out of the total of 61333 items of electric equipment inventoried, 2614 transformers and capacitors and 1977,2 t oils, containing PCBs > 0,05 % by weight have been identified (*table 4*). Holders of that PCBs equipment are mainly companies from electric power sector, metallurgy, mining and chemical industry.

Table 5 shows detailed data for the status of equipment and oils, containing PCBs.

Table 5 In-use, phased-out and spare equipment, containing PCBs and oils,containing PCBs, including in-use, waste and fresh on stock in Bulgaria for 2003

Nº	Equipment and oils, containing PCBs and PCBs assumed	Unit	Quantity
1.	**TRANSFORMERS**		
	In-use transformers with PCBs concentration > 0,05 % by weight and volume > 5 dm^3	**pcs**	**158**
	In-use transformers with PCBs concentration > 0,005 % by weight and volume > 5 dm^3	**pcs**	**41**
	In-use transformers with PCBs assumed	**pcs**	**3082**
2.	**TRANSFORMER OILS**		
	In in-use transformers with PCBs concentration > 0,05 % by weight and volume > 5 dm^3	**t**	**310,5**
	In in-use transformers with PCBs concentration > 0,005 % by weight and volume > 5 dm^3	**t**	**1642,1**
	In in-use transformers with PCBs assumed	**t**	**2483,6**
3.	**WASTE TRANSFORMER OILS**		
	waste transformer oils with PCBs concentration > 0,05 % by weight	**t**	**9,88**
	waste transformer oils with PCBs assumed	**t**	**10,24**
4.	**FRESH TRANSFORMER OILS ON STOCK**		
	fresh transformer oils with PCBs concentration > 0,05 % by weight	**t**	**6,8**
	fresh transformer oils with PCBs assumed	**t**	**36,84**
5.	**CAPACITORS**		
	In-use capacitors, containing PCBs	**pcs**	**1769**
	In-use capacitors with PCBs assumed	**pcs**	**2159**
6.	**SPARE CAPACITORS ON STOCK**		
	Spare capacitors, containing PCBs	**pcs**	**32**
	Spare capacitors with PCBs assumed	**pcs**	**245**
7.	**PHASED-OUT CAPACITORS ON STOCK**		
	Phased-out capacitors, containing PCBs	**pcs**	**614**
	Phased-out capacitors with PCBs assumed	**pcs**	**230**
8.	**CAPACITOR OILS**		
	In in-use capacitors, containing PCBs	**t**	**7,9**
	In in-use capacitors with PCBs assumed	**t**	**3,3**

Only PCBs transformer & capacitor oils have been identified. The weight of PCBs equipment has not been reported , causing gaps in the data declared. In many cases, PCBs equipment owners declared either the number of items of equipment or the oil quantity but not both. Hence the PCBs quantity in equipment and oils is assumed to be higher than the found out by the inventory. To identify the actual PCBs quantity a detailed inventory of PCBs is needed.

2. 3. Assessment of PCDD/PCDF, HCB and PCBs rleases

The emissions are calculated in relation with National CORINAIR - 94 methodology, approved by the Minister of Environment and Waters. It was developed by adapting the emission inventory Guide - CORINAIR-94, SNAP-94 for the Bulgarian conditions, taking into account the national specificities concerning the respective activity, technologies and equipment.

National annual POPs emissions (Dioxins/Furans, PCBs and HCB)

In comparison to base year 1990, the annual emissions of **dioxin/furans** for 2003 show a downward trend of 53,9% or 2,2 times had been observed, following the European trend. According to official data for PCDDs/PCDF emissions in Europe within the period 1990-2003,the decrease is 2,7 times (63%). The annual **PCBs** emissions for the period 1990-2003 are almost the same. For the period 1990-2003, the **HCB** emissions in the atmosphere show a significant downward trend. Compared to the base year 1990, for the HCB emission in 2003, a sharp decrease with 91,7% or 12,1 times has been registered due to the decline of industrial production.

Table 6 National annual emissions of POPs releases in the atmosphere for the period 1990-2003

Year	**1990**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
PCDDs/Fs, g I-TEQ/y	554,2	456	340,9	309,7	288,3	245,2	232,5	200,9	218,5	255
PCB, kg/y	258,5	382,3	261,7	226,9	252,8	234,3	228,5	211,9	250,1	260,7
HCB, kg/y	544	79	87	47	76	46	54	42,5	38	45

Figure 1 Annual PCDDs/PCDFs releases in the atmosphere by years

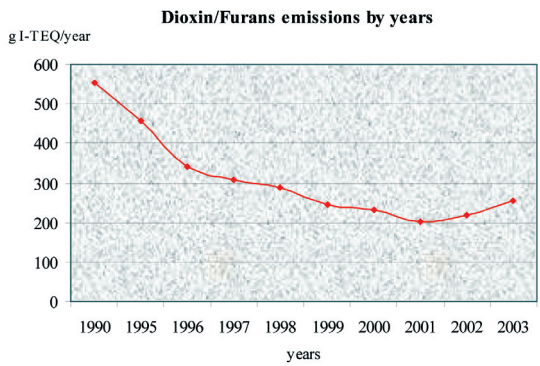
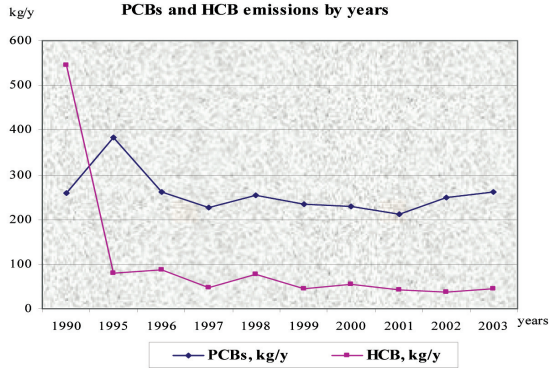


Figure 2Annual PCBs and HCB releases in the atmosphere by years



National annual sector POPs emissions by category sources

POPs releases, generated in Bulgaria in the past 5 years are within the range as follows:

- **Dioxins/Furans:** 200 - 255 g I-TEQ/y, and in 2002 have reached 254,9 g I-TEQ/y.
- **PCBs:** 212 ч 261 kg/y, and for 2003 have reached 260,7 kg.
- **HCB:** 38 ч 54 kg/y, and for 2003 being 45 kg.

Compared to the base year 1990, **PCDDs/PCDFs and HCB** note a sharp decline, respectively with 53,9% or 2,2 times and with 91,7% or 12,1 times. The annual PCBs emissions for the same period are almost the same, which could be explained with upward or downward change of the PCBs emissions formed by various category sources.

Table 7 Unintentional Production of POPs Releases for 2003 by category sources

Categories of POPs releases	**PCDDs/Fs**, g/y	**PCBs**, kg/y	**HCB**, kg/y
Combustion processes in energy generation and transformation	122,6	46,14	0
Combustion processes in public and household sectors	70,9	164,61	0
Industrial combustion processes	9,7	2,26	0
Production processes	23,5	0	21
Road transport	10,5	37,05	0
Other motor vehicles and machines	10,5	10,51	0
Waste treatment and disposal	7,3	0,14	24
Total annual POPs releases	**254,983**	**260,71**	**45**

The registered decline in **PCDDs/Fs** emissions into the atmosphere for 2003 compared to base year 1990 is due mainly to the categories „waste treatment and disposal" – 95%, „combustion processes in industry" – 88%; „industrial processes" - 46% and „road transport and other motor vehicles and machines" – 43%. The lowest decline show category sources „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing" – 25% and „combustion processes in energy generation and transformation" – 23%.

The registered decline in **PCBs** emissions into the atmosphere for 2003 compared to base year

1990 is due mainly to the categories„road transport and other motor vehicles and machines" – 54% and „combustion processes in energy generation and transformation"- 18%. PCBs emissions from categories „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing" have increased considerably with 88,8%, which could be explained mainly with the growth in the consumption of wood and coal in household sector during past 5 years.

The main sources of **HCB** emissions in air for 2003 are the categories „waste treatment and disposal" and „industrial processes" with lasting downward trend. Compared to base year 1990 a sharp decline of HCB emissions with 91% or 11 times is registered for the category „waste treatment and disposal" .

The combustion processes are the main source of **PCDDs/Fs and PCBs** emissions for 2003.

Thermal electric power stations emit about 48,1% of total annual **dioxinx/furans** emissions, followed by combustion processes in household sector – 27,8%, combustion processes in industry – 13% and road transport and other motor vehicles and machines – 8,2%.

The biggest source of **PCBs** emissions in 2003 are the combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing, representing 63,1% of total PCBs annual sector releases, followed by road transport and other motor vehicles and machines – 18,2% and the combustion processes in energy generation and transformation – 17,7%.

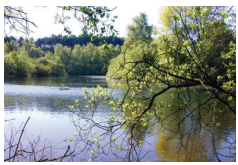
The main sources of **HCB** emissions in 2003 are the categories „waste treatment and disposal"- 53,4% and „industrial processes" – 46,7%, being for 2003 – 45 kg.

2.3.1. MONITORING

The monitoring data of PCBs and HCB in soil , ground water and food indicate:

In soil

The total PCBs content of soils is significantly (by a multiple factor) below the levels of concern which allows the assumption that no potential threat exists for pollution of soil with PCBs. There are no HCB polluted soils in Bulgaria.



In ground water

In Bulgaria for 2001 there are no ground water polluted with PCBs. All values were below the ecological threshold and this classifies the ground water as ground water in excellent condition. There is no HCB polluted ground water in Bulgaria for the investigated period. All values were below the minimum detection level in the period 1998 – 2002 and this classifies the ground water as ground water in excellent condition.

In food

No presence of any residues from PCBs in the tested samples of Live Animals, Fresh Meat, Poultry, Fish, Farmed & Wild Game, Raw Milk, Hen Eggs and Bee Honey in Bulgaria for the Year 2003 has been detected.

In wild animals

The analysis of PCB in subcutaneous fat of a bear killed in April 2004 in Central Stara Planina, Troyan area, showed 142 ng/g fat of polychlorinated biphenyls.

In human body

No presence of any residues from **PCBs** in the tested samples of Live Animals, Fresh Meat, Poultry, Fish, Farmed & Wild Game, Raw Milk, Hen Eggs and Bee Honey in Bulgaria for the Year 2003 has been detected. No investigations for **PCDDs/PCDFs and HCB** in food had been performed.

WHO carried out periodically monitoring programmes on the levels of PCDD/PCDFs and dioxin-like PCBs in human milk. The results of the third round of the WHO 2001-2002 co-ordinated exposure study show that **the lowest levels of PCDDs/Fs have been found in Bulgaria** (median value of 6,14 pg WHO-TEQ/g fat) and of **dioxin-like PCBs – being one of the lowest** (median value of 4,21 pg WHO-TEQ/g fat) after Hungury.

2.3.2. POPS EFFECTS ON HUMAN HEALTH

Many laboratory experiments have been conducted to test the relationship between POPs exposure and a range of adverse outcomes in animals. *Table 8* shows some possible effects that can be produced by some of POPs – dioxins/furans, PCBs and HCB and Category of carcinogenicity by JARC.

Table 8 Potential effects of individual POPs

Types of Effects	PCDDs	PCDFs	PCBs	HCB
Reproduction and/or development	X	X	X	X
Cytochrome P450 system	X	X	X	X
Porphyria	X	X	X	X
Immune system	X	X	X	X
Thyroid and retinol effects	X	X	X	X
Skeletal changes	X	X	X	
Endocrin disruptor	X	X	X	
Carcinogenic effects	X	X	X	X
Category of carcinogenicity IARC*	Group 1 – carcinogen to humans: Only for 2,3,7,8- Cl_4DD Group 3 – not classifiable as carcinogen to humans: For all other PCDDs	Group 3 - Not classifiable as carcinogen to humans	Group 2A - probable carcinogen to humans	Group 2B – possible carcinogen to humans

* ***IARC –*** *Classification of agents, mixtures and exposures according to their carcinogenic risk to humans in accordance with the procedures adopted as standard IARC practice: Group 1 - carcinogenic to humans; Group 2A - probably carcinogenic to humans; Group 2B - possibly carcinogenic to humans; Group 3 - not classifiable as to carcinogenicity to humans.*

The risk is negligible in all regions if the risk quotient DI/Netherlands TDI is used for the calculation.

The annual average concentration of DDT and Dieldrin in all monitored districts present no health risk for the general population.

One of the lowest levels of PCBs and PCDDs/PCDFs in breast milk within the European countries have been found in Bulgaria for the period 2001 – 2002.

Potential risk for environmental pollution in case of accidents in the regions close to old non-repaired warehouses for storage of obsolete pesticides.

Regions with potential for formation of POPs emissions (PCDDs/PCDFs, PCBs and HCB) are theregions, close to the big thermal electric power stations, using lignite coal and mazut, the large industrial manufacturers, using mazut as fuel and the large cities, where the main roads and R.W. lines of the country pass by. The risk of air pollution with dioxins/furans and PCBs from forest fires, the municipal waste disposal sites and uncontrolled burning of solid municipal waste, stubbles and tires should not be neglected.

3. STRATEGY AND ACTION PLANS OF NIP FOR POPS

Based on the results obtained from preliminary inventory of various POPs categories **SWOT analysis** on the possibilities to meet the provisions of Stockholm convention in R Bulgaria has been implemented. Based on the SWOT analysis, the major objectives for the future development of the country in the field of management of persistent organic pollutants (POPs).

Strategic goal and specific objectives are presented as a major long-term strategy and specific national objectives in medium-term and short-term, the country is facing out (*Objectives tree*). Within the technology of strategic planning SWOT-Analysis (Strengths, Weaknesses, Opportunities and Threats) is of key importance for the strategic planning process. It helps to prioritise the results of the environmental scan analysis and to structure them in such a way as to allow for the setting of the strategic goals and specific objectives of the Republic of Bulgaria to be pursued in the coming years. The analysis showed that R Bulgaria has good institutional, professional and scientific capacity to meet its obligations under Stockholm convention.

The implementation strategy of NIP for POPs is based on the following principles:

- Adherence to Stockholm Convention provisions;
- Adherence to EU directives provisions;
- Adherence to „the polluter-pays" principle;
- Adherence to and enforcement of international standards;
- Integration within overall environmental management and sustainable development policies;
- Public and stakeholder participation and transparency of the decision making process regarding POPs issues;
- Transparency in information sharing and exchange on POPs issues;
- Provision to the public of available information on POPs and training of professionals on the implementation of measures and activities, included in the NIP for POPs;

The longterm strategic goal of the National Implementation Plan for management of POPs in R Bulgaria is: *to protect human health and the environment from harmful impact of Persistent Organic Pollutants based on the environmental policy for sustainable development*.

The National implementation plan for management of POPs formulates the following **8 major national objectives** addressed to:

1. Develop and Strengthen Insititional and Administrative Capacity at national, regional and municipal levels;
2. Eliminate intentional production and use of POPs;
3. Minimize or prevent releases from sources of unintentional production of POPs (Dioxin/ Furans, HCB and PCBs);
4. Reduce or eliminate obsolete pesticides stockpiles, containing and/or contaminated with POPs;
5. Develop and endeavour to apply Action plans for implementation of measures, envisaged in the NIP;
6. Encourage and promote research, development and monitoring pertaining to POPs including on their:
   - presence and levels in humans and the environment;
   - effects on human health and the environment.
7. Raise public awareness with regard to POPs;
8. Attract investments and encourage activities with regard to POPs management.

During the NIP development process the following **10 priorities of national significance** among POPs categories were defined:

1. Development and enforcement of plan for environmentally sound management stockpiles and wastes in order to reduce/eliminate obsolete pesticides, containing/contaminated with POPs;
2. Development of plan for identifying and remediation of contaminated sites.
3. Development of strategy for identification, marking and step-by-step phase-out of use of PCBs operating equipment;
4. Development of an action plan for safe storage and environmentally sound disposal of equipment and oils, containing PCBs;
5. Development an action plan for reduction/elimination of releases from unintentional production (D/Fs, HCB and PCBs);
6. Evaluation of negative POPs impacts on human health and monitoring of POPs levels in humans and the environment;
7. Encouragement and support for research on POPs effect on humans and the environment;
8. Promotion and facilitation of public awareness raising with regard to POPs;
9. Securing the financial resources for the implementation of NIP measures by attracting investments from international finance institutions and donors.
10. Integration of the NIP in the existing National Environmental and Sectoral policies;

To achieve the main national objectives, three specific Action plans for each POPs were developed building on the findings of the preliminary assessment on POPs inventories results:

- **Action plan for POPs - Pesticides**
- **Action plan for PCBs in Equipment**
- **Action plan for POPs releases from unintentional production (D/Fs, PCBs and HCB).**

The proposed Action plans cover the period 2006-2028 and includes the major measures and activities envisaged for the implementation of the NIP for POPs.

By the adoption and the implementation of the present plans, it is aimed that optimal balance between the different legislative, institutional, economic and technical measures and implementation of integrated approach for POPs management to be achieved. The plans determine also the responsibilities of the various institutions and organizations related to the implementation of the proposed activities in NIP, the expected costs and the probable sources of funding.

Table 9 Short Summary of the proposed activites, included in the Specific Acton Plans for each POPs category

№	Action plan	Activities
1.	**Enforcement and Regulatory strengthening measures for POPs management**	**Effective enforcement of existing legislation, regulating POPs management:** - Enforcement of existing legislation, regulating POPs pesticides management; - Enforcement of existing legislation, regulating the management of PCBs in equipment; - Enforcement of existing legislation, regulating the Emission Limit Values of D/Fs, released into atmosphere from facilities and activities with stationary point sources.
2.	**Measures for providing methodology support for the enforcement of POPs management legislation**	Development of Obsolete and POPs Pesticides Storage and Stock control Manual and Guidelines for the environmentally sound Management of obsolete and unwanted pesticides. **Development of technical Manual and Practical Guidelinesq supporting the enforcement of PCBs Regulation** – for for carrying out inventory of PCBs equipment; for labelling , decontamination/clean-up and dismantling of PCBs equipment, and safe storage of PCBs waste oils. Updating of „Methodology for Determination of the Emissions of Dioxin and uran Releases in the Air" based on CORINAIR Methodology.
3.	**Administrative capacity strengthening of authorities, responsible for POPs management**	Strengthening of municipal administrative capacity for control and safe storage of obsolete pesticides' stockpiles, including appointment of additional personnel. Strengthening of administrative capacity of RIEWs for control and inspection of operating PCBs equipment and for the conditions for storage of dismantled equipment and wastes, containing PCBs
4.	**Measures for personnel qualification raising/training and technical resources**	Carrying out Seminars and Training Workshops for qualification raising of experts of relevant state authorities over the NIP implementation. Training Workshop for qualification raising of industry professionals and personnel, engaged in MoEW in regard to: - Carrying out detailed PCBs equipment inventory; - ES storage, decontamination and disposal; - Control of PCBs equipment and wastes, containing PCBs; Strengthening of laboratory infrastructure for control and analysis of PCBs and HCB in waste gases, waste water, soils, air, food of vegetable and animal origin. Strengthening the laboratory infrastructure for analysis of POPs pesticides in the environmental media, in foods of vegetable and animal origin and the evels in human tissues; including delivery of necessary equipment, personnel training and lab accreditation. Strengthening the laboratory infrastructure for analysis of PCBs in oils and accreditation of sufficient labs.

№	Action plan	Activities
5.	**Measures to ensure sufficient and reliable data on POPs**	Updating NIP for POPs every 5 years. Annual updating of the data base for obsolete pesticides stockpiles Carrying out of a Detailed inventory of 2308 t of „unknown" obsolete pesticides not yet secured, stored in 477 unrepaired in-use warehouses with the aim to identify the assumed available between 22.3 t - 25.8 t POPs pesticides and approx. 30 t mixtures, consisting of or contaminated with POPs. Carrying out of a Detailed inventory of equipment (in-use and phased out) and oils, containing PCBs. Establishment of Sofware and data base for in-use and phased out PCBs equipment and waste, containing PCBs and its regular updating. Annual updating of data base for Dioxins/Furans, PCBs & HCB in emissions.
6.	**Measures to reduce or eliminate releases from intentional production and use, according Article 3.**	Observing the ban for import and use of POPs pesticides. Observing the ban for import and export of PCBs. Obeying the permitted use of PCBs in closed systems – transformers and capacitors.
7.	**Measures to reduce or eliminate releases from unintentional production, according Article 5.**	Promote the application of available, feasible and practicle measures for a realistic and meaningful level of POPs release reduction or source elimination by including in the requirement of the issued Imtegrated permits of BAT and BEP for the facilities from energy, metallurgy, chemical and cement industries and domestic solid waste burning plants, where it deems appropriate.
8.	**Measures to reduce or eliminate releases from stockpiles and waste, according Article 6.**	**Environmentally sound storage Obsolete pesticides stockpiles -** Handling, collecting, repacking, transporting and storing in an environmentally sound manner of obsolete pesticides in newly constructed or repaired centralized and municipal storages facilities or capsulation in BB-cubes Development of a long-term business plan for gradual disposal of POPs and obsolete pesticides currently in long-term storage and site remediation. **Safe and environmentally sound disposal of obsolete pesticides stockpiles**: - Removal and disposal abroad of 2308 t of „unknown" obsolete pesticides, stored in 477 unrepaired in-use warehouses and site remediation, if international funding is provided; - Removal and partial disposal of obsolete pesticides, identified as consisting of or contaminated with POPs abroad, if international funding is provided; - Gradual disposal of obsolete pesticides stockpiles currently in long-term storage and site remediation. **Safe operation of in-use PCBs equipment (transformers and capacitors) and gradual phasing out:** - Prepare short-term plan for labeling and decontamination/retrofilling of in-use PCB equipment;

№	Action plan	Activities
		- Prepare long-term plans for phase out of in-use PCBs equipment, dismantling, decontamination, safe storage, appropriate disposal ahead of national legislation deadlines; - Develop detailed business plans for environmentally sound end-of-life management for highest risk PCBs equipment and waste; - Labelling of in-use PCBs equipment - transformers and capacitors; - Decontamination of transformers with PCBs concentration above 0,05 % by weight and volume above 5 dm^3; - Gradual Phasing-out of equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3 . **Collection and safe storage of phased-out equipment and oils, containing PCBs:** Provision of the necessary storage sites for safe storage of phased out PCBs equipment and wastes, containing PCBs - transformer and capacitor oils. **Disposal of the equipment and wastes, containing PCBs:** - Export for disposal of 20,12 t waste PCBs transformer oils abroad, if international funding is provided; - Export for disposal of 844 phased out PCBs capacitors abroad, if international funding is provided; - Gradual disposal of highest risk phased out equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3.
9.	**Measures for control and monitoring, according Article 11.**	Exercising permanent control over the implementation of legal requirements for safe storage of obsolete and unusable pesticides stockpiles and regular inspections of storage facilities status. Development of a Manual for the procedures and requirements for monitoring, and inspections of the PCBs equipment. Exercising permanent control over in-use PCBs equipment and over the conditions for storage of dismantled equipment and wastes, containing PCBs. Observing of existing admissible emission norms for Dioxins/Furans,PCBs and HCB by exercising permanent control over the implementation of the requirements of the issued Imtegrated permits. Exercising permanent control over the implementation of existing limit values of PCBs releases in the air of working media. Monitoring of soils with local spot POPs pollution, including spot points where DDT and metabolites values exceeding the maximum admissible concentra tion and intervention concentration level were registered. Monitoring of ground waters for POPs content in the regions close to storages for obsolete and out-of-use pesticides.
10.	**Information exchange, according Article 9.**	**Facilitate and undertake the exchange of information relevant to POPs:** - Performance of information exchange among the stakeholders, responsible for POPs management;

№	Action plan	Activities
		- POPs information dissemination & networking of scientific publications, developed projects, seminars and scientific forums on POPs Web-page of MoEW.
11.	**Measures for Public information, awareness and education, according Article 10.**	**Educational and Public awareness raising programmes on POPs issues:** - Development of educational public awareness programmes on POPs issues, as well as on their health effects, especially for women, children and the least educated; - Development of educational programmes and suitable school text books for pupils and students knowledge on POPs issues. **Provision of Public access and awareness raising on POPs issues:** - Publication of NIP for POPs on the Web page of MoEW; - Updating of MoEW's Web page by including available information on POPs; - Publication and dissemination of NIP for POPs - hard copy of NIP Executive summary; - Provision to the public available information on POPs trough Information centers at MoEW, EEA and at RIEWs; - Providing opportunities for public input, opinions and statements and raise questions & responses , addressing POPs management through the Forum „Green Graphite" on the MoEW's Web site; - Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level. **Development and dissemination of public awareness materials at the national level for POPs and their health and environmental effects:** - Development, publication and dissemination of POPs popular brochures for their human health and environmental effects; - Development, publication and dissemination of POPs popular brochures and leaflets for awareness raising on POPs pesticides and their effects on human health and the environment among the farmers and rural population; - Development, publication and dissemination of POPs popular brochures and leaflets for PCBs issues and their effects on human health among operators of PCBs equipment; - „POPs: Be careful" Strengthening NGOs' capacity in realization of the information campaigns and improve communications with local community and other counterparts; - Sharing information about POPs Public awareness campaign on POPs „Planet without POPs"- dissemination of POPs popular brochure. Development and carrying out „round-tables" discussions for public awareness raising on POPs effects oh human health and the environment with gender focus on young people and target groups of local communities and other counterparts.
12.	**Measures to encourage research and development, according Article 11.**	Carrying out representative research investigations for POPs levels of accumulation in risky groups of population, especially women and children in rural areas close to the storages for obsolete pesticides. Carrying out representative research investigations for POPspesticides levels in soils and products of vegetable origin in field farming areas close to the storages for obsolete pesticides.

№	Action plan	Activities
		Carrying out investigations on identifying PCBs level accumulation in human tissue and population health status assessment with priority to risky groups in the regions with high concentration of PCBs equipment.
		Carrying out representative investigations of PCBs accumulation levels in reast milk and fat tissue in women – suckling mothers in the regions with high concentration of PCBs equipment.
		Undertake research works geared on alleviating the effects of POPs on reproductive health.
		Carrying out representative comparable investigations for Dioxin/Furans & PCBs content in chicken eggs in the regions close to the large thermal power plants (TPP).
		Carrying out investigations for Dioxin/Furans & PCBs concentrations in food (hen eggs and eggs products, milk and diary products, fresh meat and animal products,reach in fats, sea and river fish).
13.	**Reporting according Article 15.**	Development of a Progress Report for the the NIP implementation and providing it to Secretariat.

Based on the measures and activities envisaged in the NIP for the management of POPs, a preliminary assessment of the funds required for the successful implementation of NIP has been performed. The total budget required to implement all activities planned under the NIP exceeds 50 millions BGN (approx. 30 millions US $), excluding the costs needed for the construction of the National centre for treatment of hazardous waste (87 million BGN) and lab infrastructure for DIOX/Fs determination in environmental media (approx. 6 million BGN).

To implement the most urgent activities related to reduce the negative impacts of POPs on human health and the environment , the Republic of Bulgaria requires funds amounting to 27 455 000 BGN(approx. 17 069 000 US $). The state budget could cover about 10%, mostly as contribution in-kind, providing necessary experts support, offices, technics (computer and copy equipment), communications (Internet, telephone, fax, mail services), office supplies, etc.

The Republic of Bulgaria can not cope alone with the full incremental costs of meeting the obligations of the Stockholm Convention and requires international financial support. To reduce the risk to human health and the environment of POPs stockpiles urgent measures should be taken for safe storage and/or environmentally sound disposal abroad, due to absence of appropriate disposal facility in the country. For this purpose the Republic of Bulgaria needs to be supported by providing financial resources from GEF and other international, bilateral, regional and multilateral twinning programmes.

The Republic of Bulgaria requires urgently funding amounting to 21,7 million BGN (approx. 13,6 million US $) for the following activities:

- For carrying out a detailed inventory and disposal abroad of 2308 t obsolete pesticides stored in 477 unrepaired operating warehouses – 14,7 million BGN (approx. 9,2 million US $)**;**
- For carrying out a detailed inventory of PCBs equipment and wastes, containing PCBs and disposal abroad of 844 phased out PCBs capacitors and 20,12 t waste transformer oils, containing PVBs - 7 million BGN (approx. 4,4 million US $)**;**

The implementation of the POPs NIP will also require capacity strengthening in both technological/laboratory infrastructure and human resources/qualification raising as wll as management capacity building.

For the implementation of the NIP for the management of POPs, it should endeavour to provide financial resources by attracting investments on international and national source funding scale, as well as to promote taking measures by the enterprises' operators, intentionally or unintentionally producing and/or using POPs [construction of facilities for treatment and destruction of POPs, introducing the best available techniques (BAT) & the best environmental practices (BEP), etc.

To enable Bulgaria to implement the measures set out in the POPs action plans, international financing will be sought. Bulgaria will promote multiple-source funding approaches & arrangements, twinning programmes and funding through other bilateral, regional and multilateral sources and channels. Efforts shall be put to use the existing financial mechanism of the Global Environment Facility (GEF) and bilateral, regional and multilateral finance resources.

1. INTRODUCTION

The proposal of the „National Implementation plan (NIP) for the management of Persistent Organic Pollutants (POPs) in the Republic of Bulgaria" is drawn up within the Global project „Development of National Implementation Plans for the Management of Persistent Organic Pollutants (POPs)" for twelve pilot countries (Barbados, Bulgaria, Chile, Ecuador, Guinea/Conakry, Lebanon, Malaysia, Mali, Micronesia, Papua New Guinea, Slovenia and Zambia).

Bulgarian Sub Project No: GF/2732-02-4454

Executing Agency: United Nations Environment Programme (Chemicals Unit)
Project Managers GEF/UNEP-12 pilot country NIPs for POPs:
Krizstina Kiss - Project Manager for the period July 2002 – June 2005;
Dr. David Piper, Project Manager for te period June 2005 – March 2006.

Implementing Agency: Ministry of Environment and Water, Sofia, Bulgaria
Bulgarian Project Managers :
Manoela Georgieva - Deputy minister of MoEW for the period July 2002 ч June 2005
Dr. Dzhevdet Chakarov - Minister of MoEW for the period July 2005 ч March 2006

National Co-ordinator for Bulgarian GEF project: Prof. Georgi Antov, DMSc.

National Focal Point for the Stockholm Convention: Katya Vasileva, senior expert MoEW

National consultant of BG project: „Balkan Science and Education Centre of Ecology and Environment"(BSECEE), Sofia with expert group manager prof. eng.Ivan Dombalov, PhD.

The Bulgarian Sub project is financed by GEF (Global Environmental Facility) with co-financing, in-cash by the Government of Germany.

The project comprises targeted activities that will prepare the Republic of Bulgaria to meet the obligations set under the POPs Convention.

At the national level, the objectives for Bulgaria are:

i) the capacity to implement the POPs Convention through the development of a National Implementation Plan for the management of POPs;

ii) the elaboration of detailed specific action plans that will identify effective national responses, processes and measures that would reduce releases of POPs. The NIP is expected to meet the initial reporting obligations of Bulgaria towards the Convention.

The main output of the project will be NIP for the management POPs in the Republic of Bulgaria in order to meet future activities for implementing Stockholm convention.

The following activities had been carried out to achieve the main output:

1. Determination of coordinating mechanisms and organisation of process
2. Establishment of a POPs inventory and assessment of national infrastructure and capacity
3. Priority setting and determination of objectives
4. Formulation of a prioritised and costed National Implementation Plan, and specific Action Plans on POPs

5. Endorsement of NIP by stakeholders

The NIP preparation took 4 years and all the activities were coordinated by National Coordinating Committee, appoined by the Bulgarian Project Manager.

The present National Implementation Plan for the management of POPs in Bulgaria is developed on the basis of the requirements of Article 7 of Stockholm convention. Bulgaria shall transmit its implementation plan to the Conference of the Parties within two years of the date on which the Convention enters into force for it, i.e. until 20 March 2007.

NIP's main purpose is to protect human health and the environment from persistent organic pollutants and to contribute to the sustainable development of the Republic of Bulgaria by integrated framework for the POPs management, to increase the polluters responsibilities, and to encourage the investments in POPs management.

A number of experts, representatives from interested institutions, ministries, universities, organizations, NGOs, etc., included in the National Coordinating Commettee (NCC) took part actively within the process of formulating and development of Bulgarian NIP for POPs, as follows:

NATIONAL COORDINATING COMMITTEE

No	Name	Position	Organisation	Position in NCC
1	Dzhevdet Chakarov	Minister	Ministry of Environment and water	Project Manager NCC Chairman
2	Manoela Georgieva	Deputy Minister	Ministry of Environment and water	Project Manager NCC Chairman
3	Prof. Georgi Antov, DMSc	toxicologist	Ministry of Environment and water	National coordinator
4	Katya Vasileva	Senior Expert	Ministry of Environment and water	member
5	Svetla Krapcheva, MSc	Department Chief	Ministry of Environment and water	member
6	eng. Tsvetanka Dimcheva	Senior Expert	Ministry of Environment and water	member
7	Rosen Belevski	Chief Department	Ministry of Environment and water	member
8	Parvoleta Luleva	Senior Expert	Ministry of Environment and water	member
9	Veselka Nedyalkova	Junior Expert	Ministry of Environment and water	member
10	Michail Mollov, PhD	Expert Water Monitoring	Ministry of Environment and water, EEA	member
11	Maria Ninova	Junior expert Waste management	Ministry of Environment and water	member
12	Ivanka Todorova	Head of Department	Ministry of Environment and water, EEA	member
13	Angel Kostov	Department Chief	Ministry of Environment and water, EEA	member

NATIONAL COORDINATING COMMITTEE

No	Name	Position	Organisation	Position in NCC
14	Dr.Maria Tasheva, PhD	toxicologist	National Centre for Public Health Protection	member
15	Dr.Zhivka Halkova , PhD	toxicologist	National Centre for Public Health Protection	member
16	Stefan Uzunov	Director Int.Cooperation Directorate	National Service for Plant Protection Ministry of Agriculture and Forestry	member
17	Prof.Lachezar Petrov, DSc	Director of Institute of Catalysis	Bulgarian Academy of Science	member
18	Prof.Elena Zheleva, DSc	Head of Ecology Department	University of Forestry	member
19	Tsvetan Popov	engineer	SA"Civil Protection"	member
20	Andonov Svetoslav	Chemistry eng.	SA"Civil Protection	member
21	Kalina Petkova	expert	Ministry of Labour and Social Policy	member
22	Asen Petkov,PhD	Assoc. Professor	University of Chemical Technology and Metallurgy	member
23	Iliana Pavlova	economist	Bulgarian Industrial Chamber	member
24	Dr. Iliana Popova	expert	Ministry of Health	member
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1.1. Stockholm Convention on Persistent Organic Pollutants

In May 1995, the Governing Council of the United Nations Environment Programme (UNEP) took a decision that an international assessment process be undertaken of the impact of 12 dangerous substances and preparations named after persistent organic pollutants (POPs), because of they possess toxic properties, resist degradation, bioaccumulate and are transported through air, water and migratory species, across international boundaries and deposited far from their place of release, where they accumulate in terrestrial and aquatic ecosystems. POPs are aldrin, dieldrin, chlordane, endrin, heptachlor, DDT, Hexachlorobenzene, Mirex, Toxaphene, Polychlorinated Biphenyls (PCBs), Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF).

From 22 to 23 May 2001, at a Conference of Plenipotentiaries held in Stockholm, Sweden a Convention on POPs, named later a Stockholm convention on POP, was adopted and opened for signature. The convention was signed at the formal ceremony on 23 May 2001 by 92 States and the European Community. The convention remained open for signature from 24 May 2001 until 22 May 2002, when it was closed after 151 States signatures.

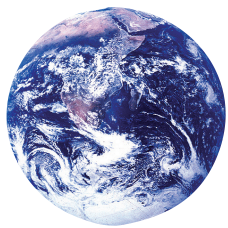
On 17 May 2004, three months after the date of deposit of the 50-th ratification instrument, the Stockholm Convention officially enters into force for the Parties on the Convention. Bulgaria signed the Stockholm Convention on POPs on 23 May 2001 at the Conference of Plenipotentiaries held in Stockholm, Sweden.

On 30 September 2004, the Convention was ratified with a Law by the National Assembly and with Decree No. 309 of the President of the Republic of Bulgaria its promulgation in the State Gazette is enacted (SG No. 89/ 12.10.2004). The Stockholm convention is effective for Bulgaria from 20 March 2005.

1.2. Objectives and provisions of Stockholm Convention

Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development,

The objective of the Convention is to protect human health and the environment from the harmful impact of Persistent Organic Pollutants.



According to Article 3 each Party shall take measures to reduce or eliminate POPs releases from intentional production and use:

(a) to prohibit and/or take the legal and administrative measures necessary to eliminate its production, import/export and use of the chemicals listed in Annex A;
(b) to restrict its production and use of the chemicals listed in Annex B

According Article 5 each party shall take measures:
(a) to reduce or eliminate the total POPs releases from unintentional production of each of the chemicals listed in Annex C, with the goal of their continuing minimization and, where feasible, ultimate elimination;
(a) Develop an action plan within two years of the date of entry into force of the Convention for it, and subsequently implement it .

According to Article 6 each Party shall take measures to reduce or eliminate releases from stockpiles and wastes in order to ensure that stockpiles consisting of or containing chemicals listed either in Annex A or Annex B and wastes, including products and articles upon becoming wastes, consisting of, containing or contaminated with a chemical listed in Annex A, B or C, are managed in a manner protective of human health and the environment. Each Party shall:

(a) Develop appropriate strategies;
(b) Identify the stockpiles consisting of or containing chemicals listed either in Annex A or Annex B on the basis of the strategies;
(c) Manage stockpiles in a safe, efficient and environmentally sound manner;
(d) Take appropriate measures to handle, collect, transport and store in an environmentally sound manner and to dispose POPs waste of in such a way that the persistent organic pollutant content is destroyed or irreversibly transformed so that they do not exhibit the characteristics of persistent organic pollutants or otherwise disposed of in an environmentally sound manner;
(e) Endeavour to develop appropriate strategies for identifying sites contaminated by chemicals listed in Annex A, B or C.

Persistent Organic Pollutants (POPs) listed in Annex A,B and C in the Stockholm convention are:

1.2.1. Annex A – Elimination, part I

Chemical	Activity	Specific exemption
Aldrin* CAS No: 309-00-2	Production Use	None Local ectoparasiticide Insecticide
Chlordane* CAS No: 57-74-9	Production Use	As allowed for the Parties listed in the Register Local ectoparasiticide Insecticide Termiticide Termiticide in buildings and dams Termiticide in roads Additive in plywood adhesives
Dieldrin* CAS No: 60-57-1	Production Use	None In agricultural operations
Endrin* CAS No: 72-20-8	Production Use	None None
Heptachlor* CAS No: 76-44-8	Production Use	None Termiticide Termiticide in structures of houses Termiticide (subterranean) Wood treatment In use in underground cable boxes
Hexachlorobenzene CAS No: 118-74-1	Production Use	As allowed for the Parties listed in the Register Intermediate Solvent in pesticide Closed system site limited intermediate
Mirex* CAS No: 2385-85-5	Production Use	As allowed for the Parties listed in the Register Termiticide
Toxaphene* CAS No: 8001-35-2	Production Use	None None
Polychlorinated Biphenyls (PCB)*	Production Use	None Articles in use in accordance with the provisions of Part II of this Annex

1.2.2. Annex A – Elimination, part II

POLYCHLORINATED BIPHENYLS

Each Party shall:

- With regard to the elimination of the use of polychlorinated biphenyls in equipment (e.g.transformers, capacitors or other receptacles containing liquid stocks) by 2025;
- Consistent with the priorities in subparagraph (a), promote the following measures to reduce exposures and risk to control the use of polychlorinated biphenyls;
- Notwithstanding paragraph 2 of Article 3, ensure that equipment containing polychlorinated biphenyls, as described in subparagraph (a), shall not be exported or imported except for the purpose ofenvironmentally sound waste management;;
- Except for maintenance and servicing operations, not allow recovery for the purpose of reuse in other equipment of liquids with polychlorinated biphenyls content above 0.005 per cent;
- Make determined efforts designed to lead to environmentally sound waste management of liquids containing polychlorinated biphenyls and equipment contaminated with polychlorinated biphenyls having a polychlorinated biphenyls content above 0.005 per cent, in accordance with paragraph 1 of Article 6, as soon as possible but no later than 2028;
- In lieu of note (ii) in Part I of this Annex, endeavour to identify other articles containing more than 0.005 per cent polychlorinated biphenyls (e.g. cable-sheaths, cured caulk and painted objects) and manage them in accordance with paragraph 1 of Article 6;
- Provide a report every five years on progress in eliminating polychlorinated biphenyls and submit it to the Conference of the Parties pursuant to Article 15.

1.2.3. Annex B – Restriction part I

Chemical	Activity	Acceptable purpose or specific exemption
DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane) CAS No: 50-29-3	Production	Acceptable purpose: Disease vector control use in accordance with Part II of this Annex Specific exemption: Intermediate in production of dicofol Intermediate
	Use	Acceptable purpose: Disease vector control in accordance with Part II of this Annex Specific exemption: Production of dicofol Intermediate

1.2.4. Annex B – restriction part II

DDT (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane)

Each Party shall:
- to eliminate the production and use of DDT and to establish the DDT Register;
- to notify the Secretariat and the World Health Organization as soon as possible in order of DDT use for disease vector control;
- to provide information for DDT use to the Secretariat and the World Health Organization in Every three years;
- to promote research and development of safe alternative chemical and non-chemical products posing less risk to human health and the environment.

1.2.5. Annex C, Unintentional production, part I

This Annex applies to the following persistent organic pollutants when formed and released unintentionally from anthropogenic sources:

Chemical

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)
Hexachlorobenzene (HCB) (CAS No: 118-74-1)
Polychlorinated biphenyls (PCB)

1.2.6. Annex C, Unintentional production, part II

SOURCE CATEGORIES

Polychlorinated dibenzo-p-dioxins and dibenzofurans, hexachlorobenzene and polychlorinated biphenyls are unintentionally formed and released from thermal processes involving organic matter and chlorine as a result of incomplete combustion or chemical reactions. The following industrial source categories have the potential for comparatively high formation and release of these chemicals to the environment:

(a) Waste incinerators, including co-incinerators of municipal, hazardous or medical waste or of sewage sludge;

(b) Cement kilns firing hazardous waste;

(c) Production of pulp using elemental chlorine or chemicals generating elemental chlorine for bleaching;

(d) The following thermal processes in the metallurgical industry:

(i) Secondary copper production;
(ii) Sinter plants in the iron and steel industry;
(iii) Secondary aluminium production;
(iv) Secondary zinc production.

1.2.7. Annex C, unintentional production, part III

SOURCE CATEGORIES

Polychlorinated dibenzo-p-dioxins and dibenzofurans, hexachlorobenzene and polychlorinated biphenyls may also be unintentionally formed and released from the following source categories, including:

(a) Open burning of waste, including burning of landfill sites;
(b) Thermal processes in the metallurgical industry not mentioned in Part II;
(c) Residential combustion sources;
(d) Fossil fuel-fired utility and industrial boilers;
(e) Firing installations for wood and other biomass fuels;
(f) Specific chemical production processes releasing unintentionally formed persistent organic pollutants, especially production of chlorophenols and chloranil;
(g) Crematoria;
(h) Motor vehicles, particularly those burning leaded gasoline;
(i) Destruction of animal carcasses;
(j) Textile and leather dyeing (with chloranil) and finishing (with alkaline extraction);
(k) Shredder plants for the treatment of end of life vehicles;
(l) Smouldering of copper cables;
(m) Waste oil refineries.

2. COUNTRY BASELINE

2.1. Country Profile

2.1.1. Geography and Population

Location: The Republic of Bulgaria is situated in Southeast Europe and occupies the eastern part of the Balkan Peninsula. To the north it borders on river Danube and Romania, to the east on the Black Sea, to the south on Turkey and to Greece and to the west on the Republic of Macedonia and the Serbia & Montenegro.

Figure 3. Map of Republic of Bulgaria

Territory

The territory of Republic of Bulgaria is 110 993.6 km^2. The total length of Bulgarian frontier is 2 245 km, of which 1181 km are land frontier, 686 km – riverside and 378 km – sea coastline . The length of road net is 36720 km and that of R.W. – 4300 km. The average altitude of the country is 470 meters above sea level.

Relief

Extremely varied: large plains and lowlands, low and high mountains, valleys and lovely gorges. The southwest of the country is mountainous, containing the highest point of the Balkan Peninsula, the Musala at 2,925 m.

Rivers, Lakes, Flora and Fauna

There are 256 rivers in toatl with length more than 2,3 km in Rbulgaria. Bulgaria's main rivers are the Danube in the north and the Struma and the Maritsa river in the south.There aren't many natural lakes in Bulgaria, although there are no fewer than 260 high-mountain alpine glacial lakes. These can mostly be found in the Rila and Pirin mountains at altitudes of 1900 to 2400 metres. The lakes and swamps along the Danube have been drained with the exception of Sreburna lake, which has the status of an UNESCO reserve due to its unique flora and fauna. However numerous dams have been built.

Bulgaria is one of the countries richest in thermal spas (140) in Europe, ranking third after the Czech Republic and Spain in number of mineral springs (above 700). These vary in mineral content and temperature and are thus used as remedies for a wide variety of ailments. Of particular balneological importance are the thermal spas at Bankya, Velingrad, Kyustendil, Sapareva Banya, Momin Prohod and Hissarya.

Bulgaria's rich biodiversity is home to over 12 350 plant species and over 15 000 animal species, including many rare species. The forests cover 35% of Bulgarian territory. Three national parks and 89 reserves and other protected areas help preserve this variety. Bulgaria has the largest number of biosphere reserves in the world.

Climate

Temperate continental with clearly marked four different seasons – spring, summer, autumn and winter. The average annual temperature is 10.5 C. The higher mountainous regions have relatively low temperatures, heavy rainfall and continuous year-round snow.

Natural Resources

Bulgaria has large areas of high-quality arable land and forests. A wide variety of mineral resources-copper, gold, iron, lead, and zinc are extracted commercially.

Population

According to the 2001 census there are 240 towns and 5 096 villages. The capital is Sofia city with more than 1, 3 million citizens. With more than 100 thousand inhabitants are 9 towns – Plovdiv, Varna, Burgas, Russe, Stara Zagora, Pleven, Sliven and Dobrich. In 2003 in the towns live 69,8% of country population, and the rural population – 30,2%. The average population density is 70.3 people/km^2.

Table 10. Country Demographic data:

Demographic data:	**01.03.2001 г.**[1)]	**31.12.2004 г.**[2)]
Population	7 973 671	7 761 049
Men	3 888 440	3 767 610
Women	4 085 231	3 993 439
Urban Population	5 500 695	5 431 800
Rural Population	2 472 976	2 329 200
Average population age	40,4	41,0
Average lifespan age	71,88	72,07
Birth rate	8,6	9,0
Mortality rate	14,2	14,2
Population growth, %	-5,6	– 5,2
Population at working age	4 673 219	4 782 000
Labour force, total, eop, num	3 265 000	3 322 000
Employees, total, eop, num	1 878 849	2 109 478
Unemployment level, %	19,5	12,2
Literate population, %	98,2	98,6

[1)] *Demographic data of NSI from the 2001 census*
[2)] *Demographic data of NSI – 31.12.2004*

Official language
Bulgarian is the official language, using the Cyrilic alphabet.

Ethnic structure
Bulgarians - 83, 9 %;Turks - 9,4 %;Roma - 4,7 %;Russians - 0,2 %; Armenians -0,1 %; Others - 1,7 %

Religions
Eastern Orthodox – 83,9%; Islam – 12,1%; Roman Catholicism – 1,6 %; Protestant denominations – 0,5%; Judaism – 0,8 %; atheists and undeclared – 1,1 %.

2.1.2 Political and economic profile

2.1.2.1. Political system
Bulgaria is a Parliamentary Republic and the basic power in the country is the legislative one. The Parliament (The National Assembly) exercises the legislative power. Its mandate is 4 years and consists of 240 MPs. They are elected by direct vote on the basis of the proportional system. The government (The Council of Ministers) is the main body of the executive power, headed by the Prime Minister. The President is the Head of State and is elected with direct elections once in every five years, for not more that two mandates.

2.1.2.2. Administrative-territorial Structure
The country is divided into 28 regions and 264 municipalities. The status and powers of the local executive authorities depend on the territory structure of the country. The municipality is the main administrative territorial unit for the local government. Every municipality is ruled by a Mayor, elected by direct vote once per every 4 years. The region is the bigger administrative territorial unit. A regional governor, assigned by the Council of Ministers, rules each region.

2.1.2.3. Economics
The Republic of Bulgaria has concluded successfully the accession negotiations with the European Union and On 25 April Bulgaria has signed the Treaty of Accession to the European Union and is expected to join the European Union on 1st of January. 2007. On 11 May 2005 The National Assembly ratified the Treaty of Accession of Bulgaria to the European Union.

Bulgaria is a functioning market economy. Macroeconomic stability enhances the performance of a market economy and has allowed sustained economic growth. Private ownership has become predominant in the economy. A well-developed financial sector improves the efficiency of the economy. RBulgaria is in Currency Board, which remained stable, enhancing the country's macroeconomic stability.

Basic macro-economic indicators

Thanks to the increasing tendency of stable economic growth in the last few years, 2004 saw the highest Gross Domestic Product (GDP) growth for the last ten years – 5.6%. The real growth of GDP is considerably higher than that in the EU countries -2.3% for 2004 .

Table 11. Basic macro-economic indicators for the period of 2002-2004

Basic macro-economic indicators	2002		2003		2004	
GDP	32 335 083 thousand BGN	15 568 534 thousand USD	34 410 244 thousand BGN	19 855 882 thousand USD	38 008 406 thousand BGN	23 799 878 thousand USD
GDP per capita	4 108 BGN	1 978 USD	4 398 BGN	2 538 USD	4 885 BGN	3 101 USD
Real growth of GDP, %	4.8		4.3		5,6	
Export (FOB)	11 857,9 million BGN	5 692.1 million USD	13 041,9 million BGN	7 444,8 million USD	15 634.6 million BGN	9 888.0 million USD
Import (FOB)	15 166.9 million BGN	7 286.6 million USD	17 343.9 million BGN	9 922.8 million USD	20 950.05 million BGN	13 257.1 million USD
Commercial balance		- 1 594.5 million USD		- 2 473.8 million USD		-3 369.1 million USD
Inflation, %	3.8		5.6		4.0	
Employees, total, eop, num	1 911 216		2 005 369		2 109 478	
Average salary, BGN	257,6		273,3		301,5	
Private sector	322,6		343,1		365,5	
Public sector	217,8		232,5		266,4	
Unemployment rate, %	16.3		13.5		12,2	
Exchange rate BGN/USD (average for the period)	2.077		1.733		1.597	

Source: NSI – up to date 15.06.2005 г.

Economic activity in 2004 increased as a result of higher employment growth than unemployment decline. The employment rise was mostly due to the jobs created in the private sector of the economy. On a 12- month basis, 2004 growth in employment is estimated at about 3%. Unemployment exhibited a steady decline both in absolute number and as a ratio. The unemployment rate based on the labour force survey methodology fell from 13.52 percent of the labour force in 2003 to 12.16 percent in 2004.

The up-going trend of average wages in the economy, viewed since 1998, continues in 2004 also. On annual basis the 2004 average wages went on the increase in both nominal (7.1%) and real (0.3%) terms still running considerably higher in the public sector vis-a-vis the private sector. However, private-sector wages reported a faster real-term growth rate of 2.2% vs. a bare 0.3% in the public sector.

Inflation ran as expected and was kept on a relatively low levels. 2004 inflation amounted to 4,0%, and 6.1% on a yearly average.

2.1.3. Profiles of economic sectors

Marked positive dynamics is observed in some sectors and industries (for example, tourism, high technology and communications, banking system, capital market). The record-breaking levels of direct foreign investments and the confirmed trend of improved business climate confirm the higher attractiveness and potential of the Bulgarian economy. For the last four years, Bulgaria has attracted $ 6, 3 billion foreign direct investments (FDI). In 2004 only, USD 2 601, 6 billion were invested in the country, which marks the highest result for the last 13 years.

The Bulgarian economy registered accelerated growth throughout the whole 2004. The value added in business activity for 2004 amounts to BGN 32, 9 billion at current prices. The overall dynamics of the value added in the private and the public sector results in 5.4 % total value added growth for the economy.

All sectors of the economy made a positive contribution to value added growth, with services in the lead with 6,0%.

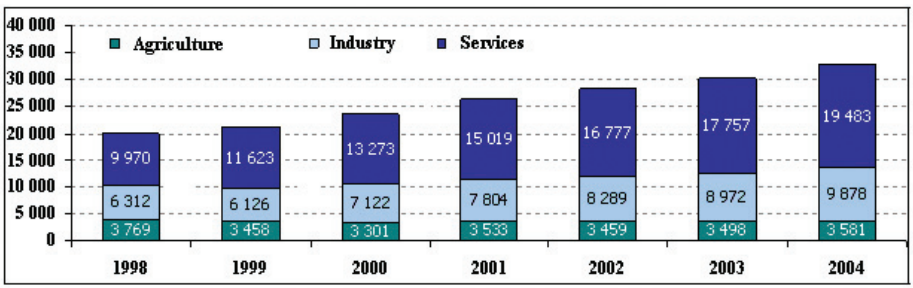


Figure 4. Distribution of GVA by sectors, million BGN

The services sector implements 59,1% of the value added for the economy. The industry branch stands for 30% of the value added and the agriculture sector contributed 10, 9% of the value added in the economy 2004.

The relative share of the value added from public services is 23.5 %. Private sector continues its up going share and creates 76, 5% of the value added, registering real growth of 7,5% vis-a-vis 2003. Growth in the private sector is not yet sufficient to achieve the desired acceleration of economic growth.

Planning regions

Bulgaria is divided into six planning regions. North West; North East; North Central; South West; South East and South Central Planning Regions. The areas are the main administrative, territorial, government and information modules comprising the targeted development regions. The planning regions conform to level II of the Statistical Classification of Territorial Structures NUTS.

Figure 5. Planning regions in Bulgaria

The Gross Domestic Product (GDP) is unevenly allocated within planning regions. In 2003 South West region generates 38% in GDP, followed by South Central – 20, 3%. North - West region has the lowest relative share of the national GDP - 5, 8%. The remaining three regions contribute within approx. 9 – 14% in GDP (fig.6).

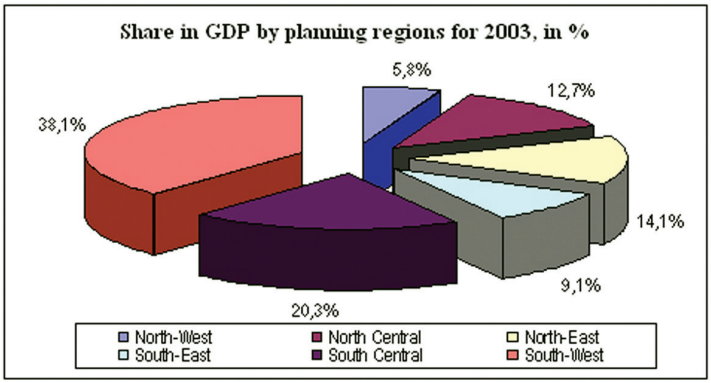


Figure 6. Share in GDP by planning regions for 2003, in %

In 2003 the structure of gross value added by economic sectors and planning regions follows the general tendencies typical for the preceding years. Real growth rates of GVA in various sectors vary substantially. The dynamics in industry were extremely positive in 2003. With highest share in GVA from industry sector is South-West region (38.1%) the lowest share contributes to North-West region (5.8%).

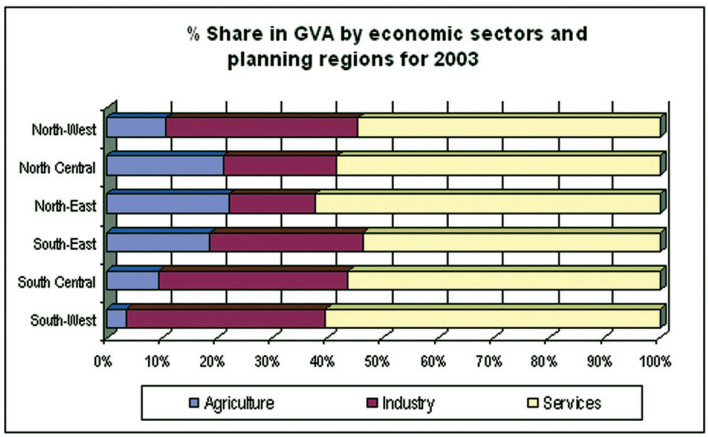


Figure 7. Share in GVA by economic sectors and planning regions for 2003 in %

The agriculture sector in 2003 generated 11,4% from GVA in Bulgaria. With highest relative share in this sector are the North-East (22,2%), North-Central (21,2%) and the South-East (18,8%) planning regions. This sector is characterized with fragmentation of agrarian farms, low efficiency and low level of commercial production.

The economic structure in all planning regions of the country is characterized with the highest relative share and up going trend in the services sector. The region with the highest relative share in GVA from services is the North-East region (62, 2%). The most dynamic branches in services sector during last years are the communications due to fast development of mobile communications and financial services.

2.1.4 Environmental overview

The ecological situation in the country reflects the generally economic condition as well as the technological structure of production. It depends of the measures (legislative, financial and others), which the society and the state undertake for environment protection.

There is a stable downward trend for atmospheric air pollution from industrial sectors in Bulgaria (mainly because of decrease in production). This decreases the number and the significance of burst pollution of the environment (water, air, soil) caused by the manufacturing process of industrial plants over the whole country's territory.

2.1.4.1. Environmental media Pollution

Atmospheric Air Pollution

In general, no deteriorating air quality trends are observed in Bulgaria.

Static industrial sources generate about 64% of dioxins and furans. Atmospheric air quality at industrial sites is influenced by diffused sources of pollution. Some slag dumps or tailings ponds that are not properly operated or are not closed according to requirements are creating local problems concerning air quality caused by secondary pollution.

Surface water contamination

Anthropogenic activities have had negative impacts on surface water and its quality through alteration of flow regimes and discharging of faecal and industrial wastewater. Some indirect factors are atmospheric pollution by rainfalls and sediments in water catchers.

The industrial sector is responsible for about 87% of the wastewater generated by the „industry" sector. Main polluters are the petroleum industry, chemical and metallurgical industry. Approximately 25% of all treated wastewater is treated by mechanical means, and the rest are subject to biological treatment.

The use and storage of pesticides, mineral fertilizers and various agricultural chemicals are a potential threat danger to surface water because of their capability of easy penetration of surface and ground water and, thus, pollute large areas.

The trend toward improved and stable surface and coastal sea water is improving as an integral

result of technological renovation of production processes and closing down of non-efficient and heavily polluting industrial plants. The increased water-quality management efficiency is performed by improved pollution control and construction or rehabilitation of urban waste water treatment plants and industrial waste water treatment facilities.

Ground water pollution

In general, groundwater quality is good and the main groundwater quality parameters are not in excess of the admissible limit values (ALV) for ground water pollution.

Some cases of local pollution of underground water with nitrates or other pollutants have been identified. Only few analyses show separate cases of pollution with petroleum products, phenols and pesticides.

Drinking water contamination

The general status of Drinking water quality in RBulgaria is estimated as „excellent".

Soil contamination

The main sources of soil contamination in Bulgaria continue to be the large industrial plants, mines and industrial wastewater as well as the production, use and storage of pesticides and fertilizers.

No lands and soils have been registered as polluted with banned for use POPs pesticides and PCBs. DDT and metabolite residues are still registered in soils in Bulgaria in isolated cases .

Wastes

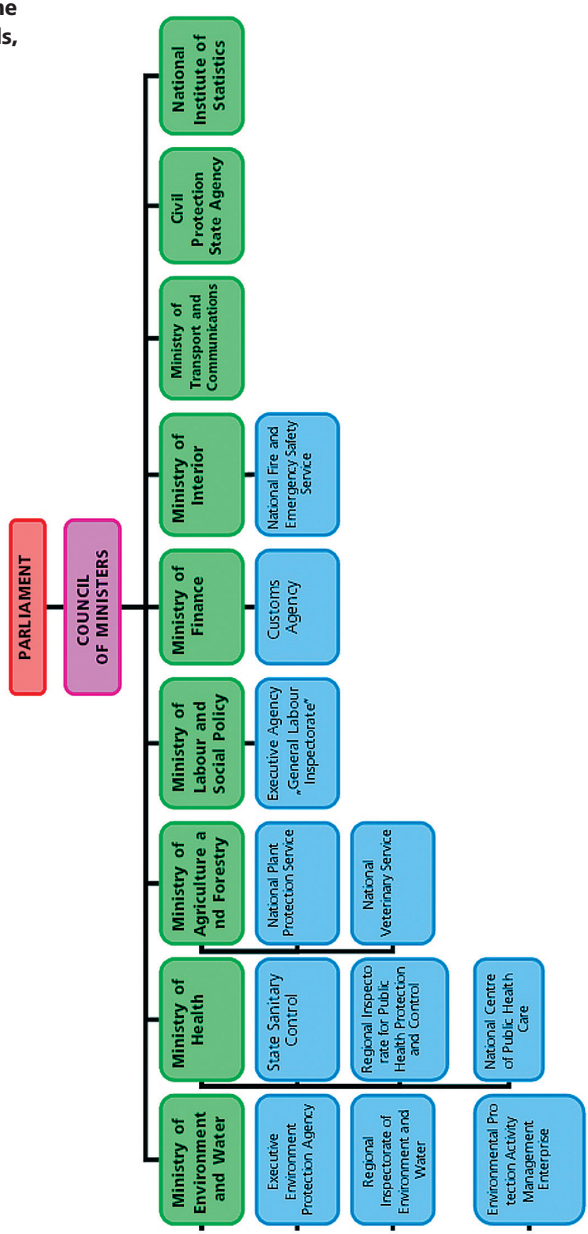
There is a tendency of decrease of generated wastes during the period 1998 - 2003.

The waste generated in 2003 is 88.9 millions tons. The predominant part in the total volume of the industrial waste is the non-hazardous waste, resulting from exploration, mining, dressing and further treatment of minerals and quarry. In 2003 are generated 84.3 millions tons industrial non-hazardous waste, 89% of which - by mining and quarrying.

The hazardous wastes are 626 thousand t. Thirty enterprises are source of 97% of all generated hazardous waste.

According to information from the municipal administration 3.2 millions tons municipal waste is collected at controlled landfill sites in 2003.

Figure 8. State Institutions responsible for the management of Chemicals, including POPs



2.2. INSTITUTIONAL POLICY AND REGULATORY FRAMEWORK

2.2.1. Environmental Policy and General Legislative Framework

Environment policy aims to promote sustainable development and protect the environment for present and future generations. These fundamental principles are incorporated in The National Strategy for the Environment 2000-2006 (NSE).

The National Environmental Strategy aims at revealing key issues, priorities and challenges in the field of environment which Bulgaria faces, at assessing major implications as well as setting way foreward which could lead to most substantial benefits for the population and the country's economy.

The long-term strategy of the country in the field of environment is *to improve the quality of life of the population by ensuring healthy and favorable environmental conditions and preservation of the rich nature based on sustainable management of the environment* by:

Ensure sufficient quantity of high quality water for the population and industry sectors;

Improvement of environmental quality in urban and rural areas;

Protection of nature and rich biological diversity;

Closer of inintegration of environmental protection policy into the sectoral and regional economic and social development policies;

Ensuring effective management and monitoring of the environment;

Implementation of Bulgarian commitments for solving of global environmental issues.

2.2.2. Roles and Responsibilities of Ministries, Agencies and other Governmental Institutions involved in POPs management

Chemicals, including POPs are managed by several governmental institutions with respective competences and rights and obligations under Bulgaria's current legislation. (fig.8)

The responsibilities, functions, obligations and rights of individual ministries are identified with the respective regulations.

Ministries and Govermental Institutions

MINISTRY OF ENVIRONMENT AND WATER (MOEW)

The main responsibilities, functions and responsibilities of the **Ministry of Environment and Water (MoEW)** are related to:

- conservation of the environment for the present and the future generations and protection of human health;
- conservation and use of environmental media;
- control and management of the factors of environmental damage;
- control and management of the state of the environment and the sources of pollution;
- prevention and limitation of pollution;
- establishment and operation of the National System for Environmental Monitoring;
- elaboration and implementation of environmental protection strategies, programmes and plans;
- collection of, and provision of access to, environmental information.

The mandate of the MoEW includes setting of regimes for conservation and use of the environ-

mental media, control of the condition and use of environmental media and the sources of environmental pollution and damage, sets emission limit values and environmental quality standards, manages the environmental media and factors, conducts environmental impact assessments (EIA), issues permits for prevention, limitation and control of pollution, designates and manages the territories that are subject to special protection regimes, develops the system of monitoring of environmental media, introduces economic regulators and financial mechanisms for environmental management, etc.

Ministry of Environment and Water is the competent authority for notification and assessment of the risks from new chemical substances, and of the import, export, prohibition, and restriction of hazardous chemicals, and issues permits for Construction and Operation of New and Operation of Existing Enterprises and Facilities, where systems for prevention of large accidents involving hazardous substances or limitation of their consequences are introduced, and keeps registers of notified chemical substances and of imported and exported hazardous chemical substances.

The MoEW controls the export, import, disposal and destruction of hazardous waste according to the current legislation and coordinates and control the enforcement of the requirements for treatment and transporting of used oils and waste petrochemicals, polychlorinated biphenyls/polychlorinated triphenyls, batteries and accumulators; the coordination and control during design, construction and operation of urban waste disposal facilities and plants, and compliance with the requirements during sitting of waste treatment facilities; the coordination and control of the enforcement of production and hazardous waste treatment and transporting requirements.

The MoEW develops and coordinates the implementation of national and sector action programmes to fulfil Bulgaria's commitments under the Stockholm Convention on Persistent Organic Pollutants.

The MoEW carries out its activities at national and regional levels by means of the **Executive Environment Agency (EEA)** and its regional structures – the 15 **Regional Inspectorates of Environment and Water (RIEW).**

The EEA carries out monitoring of environmental media and factors (including polychlorinated biphenyls, hexachlorobenzene, dioxins, furans, and polyaromatic hydrocarbons) throughout Bulgaria.

The enterprise for management of environmental protection activities /EMEPA/ is created in 2002, incorporated pursuant of the Environment Protection Act. The main operational purpose of EMEPA is to implement environmental projects and activities pursuant of national and municipal strategies and programmes in the environmental area. Consistent with its activities, EMEPA provides funding in the form of grants and interest-free or low interest loans.

MINISTRY OF HEALTH (MOH):

The Ministry of Health controls the categorization, packaging and labelling of chemicals, the notification of chemical substances and of hazardous chemicals that are subject to trading and use restrictions or prohibitions aimed to protect the health of the population. The MoH organises and controls the state sanitary and epidemiological control, and carries out immunotherapy. It develops and proposes for acceptance hygiene standards and sanitary rules regarding the conditions required for the natural, occupational, study, and household environment; regarding the safety of food, drinking water and all goods with health impacts; regarding issues of radioactivity protection, etc.

The MoH plans and organises the studying of specific public-health impacts caused by the factors of the natural, occupational, study, and household environment, and of the behaviour of individuals, assesses the health risks, develops and proposes measures to prevent the harmful public-health effect from environmental risks, and from unsafe behaviour of individuals; collects, processes and

submits to the Inspectorates of Hygiene and Epidemiology information about the hazardous chemicals; develops and proposes for establishment and introduction additional hygiene standards and requirements, or special conditions at work, training and movement of the population in the event of radioactivity accidents, industrial accidents, natural calamities or epidemic spreading of particularly hazardous infections, to protect the public.

The Ministry of Health (MoH) guides, coordinates and controls the **Inspectorates of Hygiene and Epidemiology (IHE)**, now remaned to **Inspectorates for Public Health protection and Control (RIPHPC)** as territorial units of the State Sanitary and Epidemiological Control, and the integrated prevention of diseases and promotion of health. **National Centre of Hygiene, Medical Ecology and Nutrition (NCMEN)**, now renamed to **National Centre of Public Health Protection (NCPHP)** is a specialized authority of Ministry of Health for public health protection and expert and consultant body of **Regional Inspectorates for Public Health protection and Control (RIPHPC).**

The MoH prohibits the marketing of chemicals which are hazardous to human health, and orders their destruction or processing and re-use for other purposes. The importing of psychotropic materials, substances and controlled chemicals used to manufacture narcotics, requires advance agreement with the Ministry of Health.

MINISTRY OF AGRICULTURE AND FORESTRY (MOAF):

The main responsibilities of the **Ministry of Agriculture and Forestry** are to:

- protect plants and plant products from diseases, pests and weeds by means of preventive measures during their transboundary transition, occurrence, and distribution in Bulgaria;
- introduce the introduction and improvement of methods for integrated control of plant and plant product pests;
- enforce the requirements for the plant protection chemicals and fertilizers, the regime of testing, permitting, import, production, trading, and control of their use to protect human health, animals, and the environment;
- enforce the requirements for phytosanitary quality and control of plants and plant products meant for the domestic market and for export;
- control pollutants in plants, soils, and irrigation water.

The Ministry of Agriculture and Forestry (MoAF) carries out biological testing and allows import and use of plant protection preparations, soil improvement preparations, and artificial fertilizers, and controls their proper application.

The Ministry of Agriculture and Forestry controls the plant protection chemicals released on the market. Through its local and regional structures, the **National Plant Protection Service (NPPS)** controls the import, trading in, and use of, plant protection preparations in Bulgaria for content of active substance in the formulation, labelling, content of labels, and their relation to the plant protection product.

NATIONAL VETERINARY SERVICE (NVS) is a specialized body of Ministry of Agriculture and Forestry (MoAF) for organization, coordination, management and control of veterinary-medical activity. The National Veterinary Service (NVS) is the national competent authority responsible for the State Veterinary Sanitary and Border Veterinary Control and Quarantine and for Control on Residues

in live animals and animal products. NVS exersizes control on the manufacturing, production,import, export, storage, trade in and use of veterinary medicinal preparations in Republic of Bulgaria.

MINISTRY OF LABOUR AND SOCIAL POLICY (MOLSP):

The Ministry of Labour and Social Policy (MoLSP) develops, coordinates and conducts the state policy for securing of healthy and safe working conditions . MoLSP carries out the integrated control through the **Executive Agency „General Labour Inpectorate" (EAGLI)** of legislative compliance and of the fulfilment of the obligations to ensure healthy and safe work conditions in all sectors and activities, regardless of the form of ownership.

MINISTRY OF TRANSPORT AND COMMUNICATIONS (MOTC):

The transport of hazardous chemicals is regulated by the **Ministry of Transport and Communications (MoTC),** whose competences include the determination of limit values for harmful emissions from the transport vehicles and control over their implementation.

The Customs Agency (CA) of the Ministry of Finance (MoF) controls all goods entering or leaving Bulgaria, consistent with the Customs Act. It participates in the development of the customs policy; participates in the creation of and maintains the information subsystem of categorization of chemicals; studies, collects data and specifies the types of high-risk goods for the purpose of helping customs offices in risk management through tariffs.

The Agency organizes, coordinates, guides, and controls the activities of customs offices to counteract violations related to illegal trafficking of narcotics and precursors; the receiving, storage and destruction of narcotics and precursors, etc.

Consistent with the Control of Foreign Trade in Weapons and in Goods and Technologies of Possible Dual Use Act, the Customs Agency controls the foreign trade in weapons and in goods and technologies of possible dual use, while the Ministry of Interior (MoI) participates, by means of the National Fire and Emergency Safety Service (NFESS), into the limitation and mitigation of industrial accidents involving chemicals.

State Agency For Civil Protection (SACP)

Civil protection is an element of the national security of the Republic of Bulgaria. It is a system of state, organizational, economic, and social activities aimed at protecting the population and the national economy during crisis situations in peace and war time. The Agency implements the state policy in the area of the protection in crisis situations caused by natural factors and by technical activities. It is a working body of the Standing Committee on the Protection of the Population in the Cases of Disasters and Accidents at the Council of Ministers.

National Statistical Institute (NSI)

The National Statistical Institute (NSI) has the status of a State Agency and is directly subordinated to the Council of Ministers. Mission of the National Statistical System is the effective production and dissemination of qualitative statistical information, satisfying the users needs on the

state and changes of economy, demography, social sphere and environment. NSI prepares statistical information about emissions in the atmosphere, industrial and municipal wastes, industrial and municipal water use, generated and purified waste water, environmental expenditure and investments.

Municipalities

Within their competences, **the municipalities** control the activities of generation, collection, separate storage, transporting, recovery and disposal of urban and construction waste; and the disposal of industrial and hazardous waste and the implementation of programs for their management by organising and controlling the closing, reclamation, and follow-up monitoring of landfills in the territory of the respective municipality.

PERMANENT GOVERNMENT COMMITTEE (PGC)

Consistent with the Rules of the Organization and Activities to Prevent the Consequences of Accidents, Emergencies and Catastrophes, a **Permanent Government Committee for Protection of the Population from Calamities and Emergencies** has been established at the **Council of Ministers** and is lead by a minister. The Committee includes representatives of all interested ministries, of committees and of the academic community. The Permanent Committee is assisted by the Civil Protection State Agency.

The **permanent municipal committees** carry out the following main tasks:

- organising and carrying out of activities to prevent and reduce the harmful consequences from calamities, emergencies and catastrophes;
- plan, organise, guide and control the submission and participation of formations and funds for rescue and urgent emergency restoration work upon request by the permanent committee at the Council of Ministers, and by the regional and municipal permanent committees;
- collect information about calamities, emergencies and catastrophes from their dependent structures and promptly inform the permanent committee at the Council of Ministers and the regional and the municipal permanent committees about the situation, about the measures to eliminate the effects and about the manner of behaviour and action, and make requests for assistance.

Interagency Commissions

Depending on the specifics and on the problems, several inter-agency permanent committees exist in Bulgaria, as well as temporary inter-agency working groups. The work of each committee or working group is governed by certain mechanisms *(Table12)*.

Table 12. Review of some inter-agency commissions and coordination mechanisms related to POPs

Type of mechanism	Members	Term of operation	Delegated rights
Supreme Council of Environmental Experts • Main staff; • Specialised staff: - Inter-agency Council of Environmental Experts; - Inter-agency Committee.	MoEW, MoH, MoAF, MoRDPW, MoF, MoEE, PPCA, RIEW, BD, SNCC, NDF	permanent	EIA related decisions and assessment of environmental damages; approval of programs for compliance with the environmental legislation; TORs for designing and investment projects to implement the environmental damage mitigation programmes; evaluation of plans and programs, etc.
Working group 22 „Environment"	MoEW, EEA, MoAF, MoEER, MoD, MoH, MoEE, MoRDPW, MoTC, MoAF, MoF, MJ, CPSA, SAMTS, NIS, NRA, EA BAS, BCC, BCCI, Podkrepa Union, CIUB, NGO Vazrazhdane	temporary	Draws up and approves the draft position for negotiations on the Environment sector; Discusses new drafts of regulations based on the acquis, etc.
The Inter-Agency Committee on neutralisation of past pollution with pesticides	MoAF/NPPS, MoEW, MoEE, MoH	temporary	organising of disposal
Permanent committee for protection of the public in the case of calamities, emergencies and catastrophes, at the Council of Ministers	DPSA, MoD, MIA, MoE, MoH, MoRDPW, MoEW, MoAF	permanent	Emergency action
Inter-Agency Committee for Control of Precursors at the Minister of Economy	MoH, MoEE, MoF, MoIA, MoI	permanent	Controls production, processing, use in other processes, storage, trading, mport, export, re-export, and transit of precursors; controls compliance with Article 12 of the UN Convention to Combat the Illegal Traffic of Narcotics and Psychotropic Substances.
The National Council on Work Conditions	staffed by representatives of the Council of Ministers; National Insurance Institute; national representative employer organizations; national representative worker and employee organizations;	permanent	Coordination, consultancy and cooperation in the development and implementation of the policy to secure healthy and safe occupational environment at the national level
Council on plant protection products	MoAF, MoH, MoEW, CPSA, Agricultural academy, and other specialists	permanent	Marketing and use of plant protection chemicals are allowed with an order by the Minister of Agriculture and Forests upon proposal by the Council on Plant Protection Products
Inter-Agency Committee Of Experts on Plant Protection Preparations	MoEW, MoAF, NPPS, CPSA, MoF, MoIA, MoLSP	temporary	Evaluation and control

Note: *The frequency of meetings is defined by the needs. The decision making procedures are defined by an act of the government.*

2.2.3. Relevant international commitments and obligations

Bulgaria ratified and signed most international environmental conventions and agreements and despite the difficulties of its economic transition, it has expressed its political will and is involved actively in the efforts of the international community to resolve regional and global environmental issues.

RBulgaria is a fully authorised member of the European Environmental Agency (EEA).

The International Conventions, ratified by R Bulgaria and the Multi-Lateral Environmental Agreements with Bulgarian Participation are indicated in Table 13 and Table 14.

Table 13. International Conventions

1. **Basel Convention** on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, ratified with a law, SG 8/26.01.1996, effective 16.05.1996.
2. **Geneva Convention** on Long-Range Transboundary Air Pollution, ratified with a law, SG 16/ 1981, effective 16.03.1983.
3. **Persistent Organic Pollutants Protocol** under the Geneva Convention on Long-Range Transboundary Air Pollution, ratified with a law, SG 42/2001, promulgated SG 102/2003, effective since 23.10.2003.
4. **Convention for the Protection of the Black Sea** from Pollution, ratified with a law, SG 99/ 1992, effective 15.01.1994.
5. **Convention** on the Cooperation for Protection and Sustainable Use of the Danube, ratified with a Law, SG 30/02.04.1999, effective 6.04.1999, amended SG 53/28.05.2002
6. **Rotterdam Convention** on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, ratified with a law, SG 55/2000, SG 33/ 23.04.2004, effective 24.02.2004.
7. **The Stockholm Convention** on Persistent Organic Pollutants, signed by the Republic of Bulgaria on May 23, 2001 in Stockholm, ratified by the National Assembly with a Law on 30.09.2004, SG 89/12.10.2004, in force from 20.03.2005.
8. **Convention on the Transboundary Effects of Industrial Accidents**, signed by R Bulgaria on 18 March 1992 in Helsinki, Finland;ratified, SG 28/1995,entered into force for the Republic of Bulgaria on 12.05.1995. Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters, signed on 21.05.2003 in Kiev, Ukraine.
9. **Convention on the Environmental Impact Assessment in a Transboundary Context**, Signed by RBulgaria on 25 February 1991 in Espoo, Finland, Ratified, SG 28/1995, entered into force on 10.09.1997, Amended, SG 89/1999.
10. **The United Nations Framework Convention on Climate Change - Kyoto Protocol**, Bulgaria ratified the UN Convention on Climate Change in 1995 and the Kyoto Protocol in 2002.
11. **Aarhus Convention** on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, signed by RBulgaria on 25.06.1998 in Aarhus, Denmark, ratified by the Parliament on 2 .10.2003, entered into force on 16.03.2004.
12. **Convention** on the Protection and Use of Transboundary Watercourses and International Lakes, Signed by RBulgaria on 18.03.1992 in Helsinki, Finland, Ratified, SG 86/30.09.2003,entered into force on 26.01.2004; **Protocol** on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters, signed on 21.05.2003 in Kiev, Ukraine.

Successful bilateral cooperation has continued with EU countries in order to strengthen our institutional capacity for environmental management, to implement the EU legislation transposed in our national legislation, and to find a practical solution of priority environment protection issues. The period 2001-2003 has seen the signing of **16 new bilateral cooperation agreements,** some with EU-member states such as Greece, Austria, the Netherlands and Italy.

Table 14. Participation in international agreements/procedures related to the management of chemicals

International agreements	Leading responsible institution	Relevant national scale activities
Agenda 21 - Sustainable Development Committee	Inter-agency Council for Sustainable Development	The national programme, related to environment and health protection
The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	The Ministry of Environment and Water in cooperation with the Ministry of Health	Management of hazardous chemicals and preparations
The Vienna Convention on the Protection of the Ozone Layer, and the **Montreal Protocol** on Ozone Depleting Substances	Ministry of Environment and Water	Inventory has been conducted, and a national programme is implemented.
UN recommendations for transposing of hazardous cargoes	Ministry of Transport and Communications	Licensing of hazardous cargo haulers; control
The Basel Convention on the Control of Transboundary Movement of Hazardous Waste and their Neutralization	Ministry of Environment and Water	Management of hazardous waste
The Stockholm Convention on Persistent Organic Pollutants	Ministry of Environment and Water	Development of a National Implementation Plan for Management of Persistent Organic Pollutants.
Regional Treaty for Economic Cooperation of the Countries from the Black Sea Region	Ministry of the Foreign Affairs, Ministry of Environment and Water	Elaboration of a development plan for the Black Sea Region focusing on environment protection
Bilateral cooperation with Macedonia, Slovakia, Czech Republic, Germany, China, Romania, Greece, Poland, the Netherlands, Italy	Ministry of Environment and Water	Environment protection activities, including public access to environmental information.
The Convention on the Transboundary Impacts of Industrial Accidents	Ministry of Environment and Water	Transboundary Impacts of Industrial Accidents
The Convention on the environmental impact assessment (EIA) in the Transboundary Context	Ministry of Environment and Water	EIA in the transboundary context
The Geneva Convention on Long-Range Transboundary Air Pollution	Ministry of Environment and Water	Clean Air Act

With the new Environmental legal framework has been created legislative grounds for transposition of the following EU Directives and Regulations in the national legislation:

- Directive 2003/4/EC on public access to environmental information and repealing Council Directive 90/313/EEC;
- Directive 85/337/EEC, amended by 97/11/EC on the assessment of the effects of certain public and private projects on the environment, amended and supplemented by Directive 2003/35/EC providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment ;
- Directive 96/61/EC on integrated pollution prevention and control (IPPC);
- Directive 96/82/EC Seveso II on the control of major-accident hazards involving dangerous substances and Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003 amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances;
- Regulation (EC) No 761/2001 of the European parliament and of the council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme (EMAS);
- Directive 2001/42/EC on environmental impact assessment of certain plans and programmes;
- Framework Directive 96/62/EC on AAQ Assessment and Management;
- Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants;
- Directive 75/442/EEC on waste;
- Directive 91/689/EEC on the hazardous waste;
- Regulation EEC/259/93 on the supervision and control of shipments of waste within, into and out of the European Community;
- Directive 2000/76/EC on the incineration of waste;
- Directive 99/31/EC on landfill of waste;
- Directive 86/278/EEC on protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture;
- Directive 2000/60/EC establishing a framework for Community action in the field of water policy, amended by Decision No 2455/2001/EC establishing the list of priority substances in the field of water policy;
- Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances, amended by Directive 91/692/EEC;
- Directive 76/464/EEC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community, amended by Directive 91/692/EEC, amended by Directive 2000/60/EC establishing a framework for Community action in the field of water policy;

- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances;
- Council Directive 93/67/EEC laying down the principles for risk assessment for men and environment of new chemical substance;
- Council Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations;
- Regulation (EC) No 304/2003 of the European Parliament and of the Coucil of 28 January 2003 concerning the export and import of dangerous chemicals;
- Council Directive 88/320/EEC of 9 June 1988 on the inspection and verification of Good Laboratory Practice (GLP);
- Directive 98/8/EC on the placing of biocides on the market;
- Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC;
- Council Directive 92/32/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances;
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations;
- Commission Directive 91/155/EEC of 5 March 1991 defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 10 of Directive 88/379/EEC (Safety Data Sheet);
- Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC ;
- Directive 98/8/EC on the placing of biocides on the market;
- Council Regulation (EEC) No 793/93 laying down the principles for the assessment of risks to man and the environment of existing substances;
- Commission Regulation (EC) No 1488/94 of 28 June 1994 laying down the principles for the assessment of risks to man and the environment of existing substances in accordance with Council Regulation (EEC) No 793/93;
- Decision 2001/118/EC on waste classification catalogue;
- Regulation EEC/259/93 on the supervision and control of shipments of waste within, into and out of the European Community;
- Regulation (EC) No 2557/2001 of 28 December 2001 amending Annex V of Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community;
- Directive 75/439/EEC on waste oils;

- Directive 91/157/EEC on batteries and accumulators containing certain dangerous substances;
- Directive 94/62/EC on packaging and packaging waste;
- Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT);
- Decision 2001/68/EC of 16 January 2001 establishing two reference methods of measurement for PCBs pursuant to Article 10(a) of Council Directive 96/59/EC on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs);
- Directive 2000/53/EC on end-of life vehicles.

In the period between 1997 and the present, Bulgaria has found it exceptionally important to strengthen its administrative capacity for complete harmonisation with the EU legislation. It is particularly important to increase the professional skills of the administrative capacity. One of the main tools for training of personnel are the projects implemented under **PHARE**. Twinning projects have been developed between the MoEW and the German Federal Ministry of Environment, Nature Protection and Nuclear Safety, the Austrian Federal Ministry of Environment, and the French Ministry of Spatial Planning and the Environment. The period 1999-2002 has seen the implementation of 14 twinning projects (*Table15*).

Table 15. Involvement of the MOEW in projects on technical assistance in the management of chemicals

Project Name	Organisation of financing and partners	Completed work
BG9807 – Elaboration of an overall strategy of the MOEW and updating of the National Environment Protection Plan (harmonisation of the Bulgarian environmental legislation)	• PHARE - Twinning Project	Draft strategy of the MOEW and updating of the National Environment Protection Plan
BG99EN01B – Transposing of the environmental legislation and introduction of, and support for, the implementation of the IPPC and Seveso directives	• PHARE - Twinning Project	Transposing the IPPC and Seveso directives
Drawing up of the EIA statement for the „National Hazardous Waste Treatment Centre" project	• PHARE	EIA statement for the „National Hazardous Waste Treatment Centre" project

Project Name	Organisation of financing and partners	Completed work
Hospital waste incinerator in Sofia	• DEPA • Environment Protection Activity Management Enterprise	A hospital waste incinerator is commissioned
Creation of a database on polychlorinated biphenyls and polychlorinated triphenyls in Bulgaria	• Germany	National database on polychlorinated biphenyls and polychlorinated triphenyls
Construction of an integrated system for constant monitoring and for reduction of the VOC emissions	• Greece	Integrated system for constant monitoring and for reduction of VOC emissions
Updating of the National Waste Management Programme	• Belgium	Updating of the National Waste Management Programme
Sub-project 1 - Elaboration of a national environmental strategy and reviewing of the National Environmental Plan	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany • Federal Environmental Agency, Austria • International water service, France • Environment and Energy Management Agency, France	National Environmental Strategy and National Environmental Plan 2000-2006.
Sub-Project 2 - Elaboration of a National Programme for Public Environmental Awareness and of an Action Plan for the Implementation of the Programme	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany	National Programme for Public Environmental Awareness and of an Action Plan for the Implementation and of the Programme
Sub-Project 4 - Elaboration of a Draft Regulation on the Access to Environmental Information	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany • Federal Environmental Agency, Austria	Regulation on the Access to Environmental Information

Project Name	Organisation of financing and partners	Completed work
Sub-Project 8 - Drawing up of draft regulations on the treatment of end-of-life vehicles and of disused electrical equipment	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany • Federal Environmental Agency, Austria	Regulations on the treatment of end-of-life vehicles and of disused electrical equipment
Evaluation of the White Book on the Management of Chemicals and Preparations Transposing and implementing the directives on integrated prevention and control of pollution and on the control of risks of large industrial accidents involving hazardous chemical substances	• CEFIC • Bulgarian Chamber of the Chemical Industry • PHARE • Environment Protection Agency, Ireland	Comparative analysis and report on the status of Bulgaria's chemicals legislation Adopted IPPC regulation and a Regulation on the Conditions and Procedures for Issuance of Permits for Construction and Operation of New and Operation of Existing Enterprises and Facilities where a System for Prevention of Large Disasters Involving Hazardous Substances or Elimination of their Consequences is Introduced
Transposition of the Waste Management legislation Sub-Project 2 - Management of waste containing polychlorinated biphenyls and polychlorinated triphenyls	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany	Draft Regulation on the Neutralization of PCBs Conceptual Scheme for Inventorying of PCB Containing Equipment Scheme of the National System for Collection, Transport and Treatment of PCB Containing Waste Action Plan for the Management of PCB Containing Waste Organisation Plan for Neutralisation of PCB Containing Waste
BG2001EN01D - Training of experts from the RIEWs and from the Industrial Sector for the Implementation of the Directive on the Control of Large-Scale Accidents Involving Hazardous Substances	• PHARE • Austrian Environment Protection Agency	Training of competent authorities, representing industries to implement Directive 96/82/EEC

Project Name	Organisation of financing and partners	Completed work
Project 4 - Training of RIEW and Industry Experts for the Implementation of Directive 96/61/EU on Integrated Pollution Prevention and Control	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany	Practical knowledge and approaches for IPPC implementation
Project BG2000/IB-EN/01c on Transposing of the Bulgarian Legislation in the Chemicals Sector, and first steps in its implementation	• PHARE • Federal Ministry of the Environment, nature Protection, and Nuclear Safety, Germany	The European legislation has been transposed, and databases for notification of chemicals, a registry of chemicals, etc., have been established
BG2003/1B/2N01 Enforcement of Regulations under the Protection Against the Harmful Impact of Chemicals Act	• PHARE • Federal Ministry of the Environment, nature Protection, Germany	Activities in support of the implementation of the harmonised legislation on management of chemicals
Development of a National Action Plan for Management of Persistent Organic Pollutants.	GEF UNEP	Updating of the National Chemicals Inventory of POPs in Bulgaria Management Profile Selection of POP treatment technologies Elaboration of an action plan on POPs management

2.2.4. DESCRIPTION OF EXISTING LEGISLATION AND REGULATIONS ADDRESSING POPS (MANUFACTURED CHEMICALS AND UNINTENTIONALLY PRODUCED POPS)

Regarding environmental protection, the Republic of Bulgaria is party to a number of international agreements which served as the basis to adopt the regulations on management and control of certain hazardous chemical substances and waste, some aspects of which include also the persistent organic pollutants.

All laws, including those ratifying conventions, bilateral and multilateral agreements, contracts and other international treaties, are adopted by the National Assembly and the regulations are issued with decrees by the Council of Ministers or by ministers or heads of agencies. Other legal instruments, rules, instructions, methodologies, tariffs, etc., are approved by relevant ministries and agencies.

All legal instruments in the Republic of Bulgaria are announced publicly by means of their promulgation in the State Gazette in the Bulgarian language, and promulgation is the legal prerequisite for enactment. International agreements and treaties prevail over the national legislation. Most key laws have been translated into the English language and published on-line, on the pages of the respective ministries and agencies.

R Bulgaria has transposed the main requirements of the Stockholm convention in the Law on protection from harmful impact of dangerous substances and preparations, Clean Air Act, Plant Protection Act, Waste Management Act and their sub- legislative acts.

The legal Acts and Regulations, described below are of key importance to the implementation of the provisions of Stockholm Convention in the Bulgarian regulatory framework.

Environment Protection Act, promulgated SG 91/2002, amended SG 98/2002, supplemented SG 86/2003, amended SG 70/2004, effective 1.01.2005. This Act regulates the social relations with regard to protection of the environment and of human health; conservation and use of environmental media; control and management of environmental damage and pollution sources; pollution prevention and control; establishment and operation of the National System for Environmental Monitoring; environmental protection strategies, programmes and plans; the economic organization of environmental protection activities; collection of, and access to, environmental information; the rights and obligations of the state, the municipalities, the legal and natural persons to protect the environment.

The special laws and the secondary legislation under them on atmospheric air, water, soil, waste, chemicals, stipulate the rights and obligations of the governmental and municipal institutions, the natural and legal persons, and the requirements for preventive and other activities aiming to ensure better environmental quality and to reduce the environmental and human-health risks.

Law on Protection against Harmful Impact of Chemical Substances and Preparations (LPHICSP), promulgated SG 10/2000, effective 5.02.2002, amended SG 91/2002, SG 86/2003, amended and supplemented SG 114/2003, effective 31.01.2004.

This Act sets out the terms and procedures for marketing, trading, import, export, storage and use of chemicals, the state control over them, and the rights and obligations of legal and natural persons who market, trade, store, use, import or export these substances for the purpose of protection of human health and life and environmental protection. This act extends also to chemicals in free trading areas in the Republic of Bulgaria.

It defines the procedures and manner of categorizing, packaging and labelling of existing and new chemicals for each person releasing chemical substances or preparation on the market; regulates the

procedure for notification of new chemical substances, intermediate products and polymers, and for assessment of their risks for human-health and the environment; defines the terms and procedures for marketing of biocides; stipulates the procedures for permitting of import and registration of exports of hazardous chemicals.

The act creates the legal grounds for issuance of the following secondary legislation for its implementation:

- Regulation on notification of new chemical substances, promulgated SG 67/2002, last amendment SG 110/17.12.2004;
- Regulation on the Final Risk for Men and Environment of New Chemical Substances, promulgated SG 67/2000, effective 01.01.2004., last amendment SG 110/17.12.2004;
- Regulation relating to bans and restrictions on the marketing and use of Dangerous Chemical Substances and Preparations, promulgated SG 69/2002, effective 01.01.2003, amended and supplemented SG 62/2004;
- Regulation on Import and Export of Dangerous Chemical Substances and Preparations on the territory of the Republic of Bulgaria, promulgated SG 66/2002, amended SG 63/2004, effective 01.01.2005.

Clean Ambient Air Act (CAA), promulgated SG 45/28.05.1996, amended SG 49/1996, amended SG 85/1997, amended and supplemented SG 27/2000, SG 102/2001, amended SG 91/2002, SG 112/23.12.12.2003, and effective 1.01.2004. The Act defines the setting of atmospheric air quality parameters and standards; limitation of emissions; the rights and obligations of state and municipal authorities, and the legal and natural persons, concerning the control, management, and maintenance of atmospheric air quality; the liquid fuel quality requirements, and the enforcement of liquid-fuel quality compliance during marketing.

Securing atmospheric air quality (AAQ) consistent with the established standards requires introduction of admissible limit values for harmful substances released into the atmosphere from stationary sources – Dioxins and Furans.

The Control and limitation of the emissions of harmful substances released into the atmospheric air are regulated with:

- Regulation 1 Concerning Norms for Admissible Emissionsof Harmful Substances (Pollutants) Emitted in Atmosphere from facilities and activities with Static Emission Sources, promulgated SG 64/05.08.2005, in force from 06.08.2006;
- Regulation № 6/ 26.03. 1999 Concerning the Order and Manner for Measure Emissions of Harmful Substances, Emitted in Atmospheric Air from Objects with Static Sources, promulgated SG 31/06.04.1999, amended and supplemented SG 52/26.07.2000 and SG 93/21.10.2003.

Water Act, promulgated SG 67/1999, amended and supplemented SG 91/25.09.2002, amended and supplemented SG 84/23.09.2003, amended SG 107/09.12.2003, SG 6/16.04.2004, amended SG 70/2004, effective 1.01.2005. This act aims to ensure uniform and balanced management of water in the public interest, protection of the public health, and sustainable development of Bulgaria .

Water and water bodies are protected against pollution and damage by means of: prohibition for releasing of hazardous substances in quantities that endanger life and human health, and the biological diversity in the water bodies; restrictions for releases of harmful substances; definition of sanitary

protection belts around drinking water sources and facilities, and around mineral water sources; construction of waste water treatment plants; establishment of the regime of irrigation and protection of flood plains; regulating of the prohibitions for disposal of waste and hazardous substances in locations where pollution of water may occur.

The following regulations transpose the provisions of the Water Act into the legislation of Bulgaria:

- Regulation 12/18.06.2002 on the Quality Requirements for Surface Water Intended for Drinking Water and Household Supply, promulgated SG 63/28.06.2002;
- Regulation 6/09.11.2000 on the Limit Values for Admissible Contents of Dangerous and Harmful Substances in Waste Water Discharged in Water Bodies, promulgated SG 97/28.11.2000, amended and supplemented SG 24/23.03.2004;
- Regulation 1/07.07.2000 on the Exploration, Use and Protection of Groundwater, promulgated SG 57/14.07.2000, amended SG 64/04.08.2000;
- Regulation 3/16.10.2000 on the terms and procedures for exploration, design, approval and operation of sanitary protected areas around water sources and installation for drinking and domestic water supply and around the sources of mineral water used for therapeutic, preventive, drinking and hygienic purposes**,** promulgated SG 88/27.10.2000;
- Regulation 10/27.07.2001 on the Issuing Permits for Waste Water Discharge into Water Bodies and Setting Individual Emission Limits Values for Point Sources of Pollution, promulgated SG 66/27.07.2001;
- Regulation 4 on the quality of waters supporting fish and shellfish organisms' life , promulgated SG 88/27.10.2000.

Law on Waste Management, promulgated SG 86/24.03.2003 amended SG 70/2004, effective 1.01.2005. This act defines the environmentally sound management of waste as a set of rights and obligations, solutions, actions and activities related to the generation and treatment of waste, and the forms of control over these activities.

Waste management aims to prevent, reduce or restrict the harmful impact of waste on human health and on the environment.

The following regulations introduce its requirements of this act into the national legislation:

- Regulation 3/1.04.2004 on Waste classification, promulgated SG 44/25.04.2004;
- Regulation on Packaging and Packaging Waste, promulgated SG 19/09.03.2004;
- Regulation No 6 on the procedure for filling out of report and information documents for the waste management activities, promulgated SG 78/07.09.2004;
- Regulation 7 on the Requirements for the Sites for Waste Treatment Facilities, promulgated SG 81/17.09.2004;
- Regulation 8 on the Terms and Requirements for Construction and Operation of Waste Recycling and Disposal Landfills and Other Facilities, promulgated SG 83/17.09.2004;
- Regulation on the treatment and transportation industrial and hazardous waste, promulgated SG 29/30.03.1999;
- Regulation on the Procedures and Manner of Importing, Exporting and Transit of Waste and on the Cases Requiring Bank Guarantees or Insurances, promulgated SG 102/26.10.2004;
- Regulation on the Requirements for Treatment and Transportation of Waste Lubricants and Waste Petrol-chemical Products, promulgated SG 59/21.07.2000;

- Regulation on the Procedures and Manner of Using of Waste-Water Treatment Sludge in Agriculture, promulgated SG 112/23.12.2004.

Law on the Preservation of Agricultural Lands, promulgated SG 35/24.04.1996 amended and supplemented SG 28/ 23.03.2001 amended and supplemented SG 112/23.12.2003, effective 01.01.2004. The act establishes the obligation of owners and users of agricultural lands to protect these against erosion, pollution, salinization, acidification, swamping, and other damage. To meet this basic obligation, owners are prohibited from using pesticides, mineral leaf feed fertilizers and micro fertilizers, and biologically active substances which have not received biological and toxicological registration by specialized commissions and councils of the Ministry of Agriculture and Forestry, the Ministry of Health, and the Ministry of Environment and Water. Also, it is prohibited to use organic sludge from production and other water, and of urban waste, on agricultural land without permission by the specialized authorities of the Ministry of Agriculture and Forestry, to irrigate with water containing harmful substances and to use waste above the admissible levels, etc.

Law on the Protection of Soil against Pollution, promulgated SG 67/27.07.1999, effective 28.01.2000, amended SG 113/28.12.1999. The Law defines the measures for protection of soil from pollution, the rights and obligations of state control authorities and of farmers.

The requirements of Law on the Preservation of Agricultural Lands and Law on the Protection of Soil against Pollution are provided for through the following legislation:

- Regulation 3 on the admissible content of harmful substances in soils, promulgated SG 36/08.05.1979, amended and supplemented SG 5/1996, last amended SG 39/16.04.2002;
- Regulation 26/2.10.1996 on the Reclamation of Damaged Terrains, Improvement of Unproductive Lands, Removal and Utilization of the Humus Layer, promulgated SG 89/1996, amended and supplemented SG 30/2002;
- CM Decree 50/10.03.1993, Agricultural Lands Polluted from Industrial Production Activities, promulgated SG 24/26.03.1993.

Law of Health, promulgated SG 70/2004, effective since 01.01.2005. This law defines the social relationships related to the protection of the health of citizens and helps in the creation of favourable conditions for complete physical, psychological, and social welfare of the population; sets forth compulsory hygiene standards and requirements, and sanitary rules, on all issues of hygiene, radiation protection and epidemiology.

State control is exercised over the production, import, transporting, storage, and use of hazardous chemicals, plant protection chemicals, artificial fertilizers, growth regulators, and preparations for veterinary purposes.

Law on Health and Safe Work Conditions, promulgated SG 124/23.12.1997, amended SG 114/ 2003, amended and supplemented SG 70/2004, effective 01.01.2005. This act defines the rules and obligations of: the state; employers; workers and officials to ensure healthy and safe working conditions.

Secondary legislation under the Law of Health and Law on Health and Safe Work Conditions, introducing the requirements for hazardous chemicals and POPs are:

- Regulation 13/30.12.2003 on Workers Protection from Risks, Related to Chemical Agents' Exposure at Work, promulgated SG 8/20.01.2003, effective 31.01.2005;

- Regulation 10/26.09.2003 on the Workers Protection from Risks, Related to the Carcinogenic and Mutagenic Substances Exposure at Work, promulgated SG 94/24.10.2003, effective 25.10.2004;
- Regulation 27/17.08.2005 on the Import of Goods Important for the Public Health, promulgated SG 75/1995, amended SG 78/02.09.2003, SG 4/2004, SG 15/2004, effective 31.01.2005.

Customs act, promulgated SG 15/1998; amended SG. 83/1999 amended and supplemented SG. 63/2000, SG 110/2001, suppl. SG 76/2002, amended and supplemented SG 37/2003, suppl. SG 95/2003, suppl. SG 38/2004. This Act determines the organisation of customs administrative structures and the activity of Customs Administration - customs supervision and control of the import, export and transit of goods in, out and through the territory of Bulgaria. Bulgarian Customs Act is based on the EU Customs Code.

Law on Fodders, promulgated SG 82/1999; amended and supplemented SG 101/2000; SG 58/2003; SG 69/23.08.2005; SG 87/01.11.2005, effective 01.01.2006.The Law stipulates the conditions for production, marketing on the territory of the country, import, export and use of products and substances, intended for animal food. It also defines the rights of state authorities to regulate and control the a.m. activities.

- Regulation 24 for maximum admissible concentration of unacceptable substances and products in fodders, promulgated SG 56/20.06.2003.

Law on foods, promulgated SG 90/1999, amended and supplemented SG 102/2003; amended SG 70/2004; amended and supplemented SG 87/01.11.2005, effective 01.05.2006.The Law stipulates: the requirements to foods and their public safity; packing, labeling and presentation; the terms & conditions for the production and marketing with foods; the rights and responsibilities of persons producing or marketing with foods; the rights of state authorities to regulate and control of production & and marketing with foods.

Regulation 6 for the control measures on residues of veterinary medicinal products and environmental pollutants in life animals and foodstuffs of animal origin, promulgated SG 32/29.03.2002;
Regulation 31 on the maximum admissible quantities of pesticide residue in food, promulgated SG 14/2004, effective 20.02.2004;

- Regulation 31 on the maximum admissible quantities of pollutants in food, promulgated SG 88/08.10.2004;
- Regulation 25 on the establishment of maximum residue limits of veterinary medicinal products in foodstufs of animal origin, intended for human consumption, promulgated SG 94/4.10.2002 .

2.2.5. KEY APPROACHES AND PROCEDURES FOR POPS CHEMICAL AND PESTICIDES MANAGEMENT, INCLUDING ENFORCEMENT AND MONITORING REQUIREMENTS

The existing key approaches and administrative procedures for chemicals management with relevance to POPs are classification, registration, permits, sanctions and control of chemicals and pesticides, as well as risk assessment and the special area of the prevention of major accidents(Table 16 and Table 17).

Table 16. Administrative Procedures for Control and Management of POPs Pesticides
(Annex A and Annex B of Stockholm Convention)

Administrative procedure	Import	Manufacturing	Storage	Transport	Distribution	Use	Disposal
Categorization, packaging and labelling	X	X	X	X	X	X	X
Registration of active substances and products	X	X	X		X	X	
Permits	X				X	X	X
Control	X	X	X	X	X	X	X
Sanctions	X	X	X	X	X	X	X
Information for workers/the public		X	X			X	X

(X – Adequately regulated in the legislation)

Table 17. Administrative Procedures for Control and Management of Industrial Chemicals - PCBs and HCB
(Annex A and Annex B of Stockholm Convention)

Administrative procedure	Import	Manufacturing	Storage	Transport	Distribution	Use	Disposal
Categorization, packaging and labelling	X	X	X	X	X	X	X
Registration of active substances and products	X	X					
Permits	X			X	X	X	X
Control	X	X	X	X	X	X	X
Sanctions	X	X	X	X	X	X	X
Information for workers/the public	X	X	X			X	X

Management of chemicals in Bulgaria conforms to the adopted and effective regulations, mechanisms and procedures. Their implementation guarantees prevention to the maximum extent of the impacts from storage, use and transporting (including import and export) of chemicals and preparations on human health and on the environment. Rules for safe use, packaging, labelling, storage, and transport of chemicals and preparations are introduced for the purpose. The above measures ensure environmentally sound use of these substances in the occupational and in the natural environment.

Bulgarian legislation for Chemicals Management with relevance to POPs includes:

- Regulation relating to bans and restrictions on the marketing and use of Dangerous Chemical Substances and Preparations, promulgated SG 62/2004.

In an Appendix hereto article 1 (2) of the regulation, the trade and use of **Polychlorinated byphenils** (PCBs) and preparations, including waste oils with content of PCBs more than 0,005% are prohibited. Their use is allowed till the end of 2005 for electrical equipment in close systems – transformers and capacitor.

- Regulation on the requirements for the order and the manner of inventory, labeling and decontamination of equipment, containing PCBs as well as the treatment and transportation of waste, containing PCBs, adopted by CM Decree 50/09.03.2006, promulgated SG 24/21.03.2006.

The regulation hereto determines:

- the order and manner for carrying out inventory and labeling of equipment, containing PCBs; and
- the the order and manner decontamination of equipment, containing PCB with the aim of prevention PCBs negative impacts on human health and the environment.

- Regulation on Import and Export of Dangerous Chemical Substances and Preparations on the territory of the Republic of Bulgaria, promulgated SG 63/2004.

This regulation introduces bans for use of Dicofol, containing less than 78% p,p'-dicophol or more than 1g/kg DDT or DDT related compounds as per Annex 1 hereto article 3 (1) para 3 .

The regulation determines also the dangerous chemicals and preparations, being POPs (Aldrin, Chlordane, Dieldrin, DDT, Endrin, Heptachlor, Hexachlorobenzene, Mirex, Toxaphene ,Polychlorinated biphenyls , except mono- and dichlorinated biphenyls) which are banned for import and export in and out of the territory of R Bulgaria,as per Appendix 2, hereto article 2, para 4 .

The following legislative acts introduce a ban for use in the production, import and use of **POPs pesticides** in plant protection preparations and biocides:

- Order RD12-28/21.05.2004 of MoAF; RD 09-457/13.07.2004 of MoH; RD 590/15.06.2004 of the MoEW, issued pursuant to Article 15 of the Plant Protection Act concerning the protection of plants and approving of a List of active substances prohibited for use in the Manufacturing of Plant Protection Chemicals (**The POPs pesticides -** Aldrin, Dieldrin, DDT,Endrin, Heptachlor, Toxaphene);
- List of permitted for use in Republic of Bulgaria preparations for disinfection, disinfection and deratization, published annually by MoH;
- List of permitted for marketing and use of plant protection preparations, registered fertilizers and soil improvement chemicals, published annually by MoAF;

- Regulation 44 on the terms and procedures for marketing of biocide preparations, promulgated SG 113/28.12.2004.

POPs Waste: Consistent with the Basel Convention, nine POPs – DDT, hexachlorbenzene, aldrin, chlordane, dieldrin, endrin, heptachlor, and mirex – have been classified as hazardous waste, and the Stockholm Convention requires that Bulgaria should take measures to restrict the environmental-quality impacts of POP pesticides in storage.

Administrative Procedures for POPs Waste Control and Management include classification, registration, permits, licenses and inspection.

Data about hazardous waste is collected in Bulgaria only within the system of the MoEW (by the EEPA) by means of information cards documenting the name, quantity, properties, movement, storage and disposal of waste by enterprises whose activity involves hazardous waste generation and/or treatment. Data gathering conforms to the European Catalogue of Waste and to the current Bulgarian legislation. The national classification of waste conforms to the European classification and the data are comparable.

Table 18 Administrative Procedures for POPs Waste Control and Management

Administrative procedure	Import	Collection	Temp. Storage	Transport	Trading Use	Reco-very	Disposal
Classification	X	X	X	X	X	X	X
Registration		X	X	X			X
Permits	X	X	X	X		X	X
License for trading in non-ferrous and ferrous metal waste					X		X
Inspection	X	X	X	X	X	X	X
Information for workers/the public			X			X	X

(X – Adequately regulated in the legislation)

The preventive activities aimed to reduce the environmental and human-health risks and to bring compliance with the regulations are stipulated in the Environment Protection Act, and in the regulations on the introduction of EIA procedures and on the issuing of integrated permits for construction and operating of existing plants and facilities of certain categories of industrial activity, and also, in the regulation on protection in the case of emergencies involving dangerous chemical substances:

Bulgarian legislation for **Major Accident Prevention and Control, involving dangerous substances,** transposing Council Directive 96/82/EEC Seveso on the Control of major accident hazards includes:

- **The Environmental Protection Act** (Chapter Seven, Section I „Prevention of Major Industrial Accidents");
- **Regulation** on the conditions and procedure for issuing of permits for construction and operation of new Enterprises and Facilities and for operation of existing Enterprises and Facilities implementing a system for the prevention of major accidents involving dangerous substances or the limitation of their consequences, promulgated SG 38/23.04.2003.

Bulgarian legislation for **Integrated Pollution Prevention and Control (IPPC),** transposing Directive 96/61EC on integrated pollution prevention and control (IPPC) includes:

- **The Environmental Protection Act** (Chapter Seven, Section II „Integrated Permits");
- Regulation on the Conditions and Procedures for Issuing of Integrated Permits for Construction and Operation of New and Existing Industrial Plants and Facilities, CM Decree 62/12.03.2003, promulgated SG 26/2003, amended SG 29/2003.

Various national programs and action plans determine priority activities and other activities aimed to reduce the risks or the harmful impact of the hazardous chemicals and preparations. Such documents are the National Programme for Ozone Depleting Substances aimed at reducing the harmful emissions of sulphuric and nitric oxides, the national programmes for construction of waste landfills and waste water treatment plants, the National Programme for Production of Unleaded Petrol, the National Environmental and Health Action Plan, etc.

The highest number of non-regulatory mechanisms is created in relation to the production of chemical substances. Every manufacturer of certain chemicals or preparations operates under a technology regulation. Different manufacturing processes create and adhere to different technological regulations. Other non-regulatory mechanisms related to production are the technological operating instructions for compliance with the labour safety and fire safety regulations.

Other mechanisms are the Bulgarian State Standards (BSS) and the international standards (particularly ISO), establishing quality parameters or admissible concentration of admixtures in manufactured chemicals. Product quality systems (ISO 9000), environmental management systems (ISO 14000), product control and certification systems (ISO 45000 and, presently, 17025), and safe working conditions systems (ISO 18000) are being introduced.

Regarding EIA and issuance of integrated permits, the companies elaborate programmes for compliance with EU regulations determining also the deadlines for such compliance. Some companies have already implemented such programmes successfully, others continue the implementation.

The voluntary initiatives Responsible Care and Stewardship Products, introduced by the Bulgarian Chamber of Chemical Industry in some manufacturing companies, also contribute for the reduction of environmental pollution with chemical substances, the reduction of risks from emergencies and the creation of safer working conditions. The Stewardship Products initiative marked the beginning of voluntary manufacturer responsibility during the entire life cycle of chemicals and preparations.

2.3. ASSESSMENT OF THE POPS ISSUE IN THE COUNTRY

2.3.1. INTRODUCTION

Persistent organic pollutants (POPs) are toxic chemicals that are persistent, bioaccumulate in organisms and food chains, prone to long-range transboundary atmospheric transport and deposition by air, water and, via migrating biological species and likely to cause adverse human health or environmental effects near to and distant from their sources.

The group of 12 persistent organic pollutants listed in the Stockholm Convention includes the following:

Pesticides

Aldrin, Chlordane, , Dieldrin, Endrin,
Heptachlor, Mirex, Toxaphene,
Hexachlorobenzene (HCB) and
Dichlorodiphenyltrichloroethane (DDT)
Industrial Chemicals
Polychlorinated Biphenyls (PCBs)

Unintentionally formed By-Products

Polychlorinated Biphenyls (PCBs) ,
Hexachlorobenzene (HCB)
Polychlorinated dibenzo-p-dioxins (dioxins) and Polychlorinated dibenzo-p-furans (furans)

2.3.2. ASSESSMENT WITH RESPECT TO ANNEX A, PART ? CHEMICALS & ANNEX B (POPS PESTICIDES) OF STOCKHOLM CONVENTION

The group of persistent organic pollutants that are subject to the Stockholm Convention includes the following pesticides: **aldrin, dieldrin, endrin, mirex, toxaphene, hexachlorbenzene, heptachlor, chlordane and DDT.**

2.3.2.1. Manufacturing

Chloroorganic persistent pesticides subject to the Stockholm Convention have never been manufactured in the Republic of Bulgaria.

2.3.2.2. Use

The use of POP pesticides in R Bulgaria has been largest in the 60-s. They had been used on more than 20 million decares of agricultural land, forests, etc. during this period. The negative effects for humans and for the environment evidenced throughout the world, and the prohibitive and restrictive measures, have reduced and almost discontinued the use of POP pesticides in Bulgaria. Irrational

planning and overstocking nationwide during the 60-s have resulted in overstocking of pesticides that are now obsolete, and controlled by the authorities of the Ministry of Internal Affairs.

Two stages are characteristic for the use of POP pesticides in Bulgaria:

- 1950-1970 - a period of intensive supply and use of chlororganic POP pesticides and subsequent ban for most of them in 1969, except for toxaphene, which was banned in 1985 and heptachlor in 1991.
- 1970-1990 - unofficial data show that an insignificant amount of the pesticides used comprise POPs.

2.3.2.3.Import

POPs pesticides have been imported in R Bulgaria witjin the period 1960 ч1990, most intensively in early 60-ies of past century. The first appearance of evidence of their harmful impacts has served as the cause for their banning for import and agricultural use (Table 19).

Table 19. Data about imports, registration and year of ban for POP pesticides

POPs pesticides	Import/ registration period	Imported t/y quantities,	Year	Remark of ban
Aldrin	1960-1969	135 - 220	**1969**	
Dieldrin	1960-1969	100	**1969**	
Endrin	1960-1969	100	**1969**	
Mirex	Not imported			
Toxaphene	1960-1985	100 - 150	**1985**	
Hexachlorobenzene	Not imported			
Heptachlor	1960-1990	100	**1991**	
Chlordane	Not imported			
DDT	1950-1969		**1969**	**Specific exemption** Import of dicofol containing less than 78% of p,p'-dicofol or less than 1 g/kg DDT and DDT derivates is permitted under PIC procedure

After the ban of POPs pesticides for import and use, the country took measures for their replacement in agriculture with registered in Bulgaria insecticides, suitable for application in any specific case. (*Table 20*).

Table 20 Alternatives for replacement of POPs in R Bulgaria

Pesticide	Alternatives
Aldrin,Dieldrin,Endrin, Toxaphene, Heptachlor	Organophosphates, synthetic pyrethroids, phosphides, benzimidazoles, carbamates, benzoylphenylureates, etc.
DDT	Organophosphates, synthetic pyrethroids, etc.
Chlordane, Mirex, HCB	Not imported & used in Bulgaria.

2.3.2.4.Export

Chlororganic POPs pesticides have never been exported.

2.3.2.5. POPs pesticides stockpiles

Since 1990 the banned POPs pesticides issues went deeper due to reduced control over the stored stockpiles in the facilities of former cooperative farms, agro-industrial complexes, etc. and had created prerequisites for carelessness, improper storing, illegal use, increased risks for human health and pollution of the environment.

The documentary – based inventories of prohibited and obsolete plant protection preparations carried out in 1993 and in 1995 (without on-site visits and analyses) by the National Plant Protection, Quarantine and Agrochemistry Service (NPPQAS) and in 1996 by Ministry of Agriculture and Forestry showed that in the country approx. 47267 kg of obsolete POPs pesticides stockpiles exist in 1995, the greatest amount being DDT (29234 kg), followed by heptachlor (11156 kg). Probably the available stocks of POPs pesticides in Bulgaria is bigger, due to lack of data, robbering the abandoned old storage places and insufficient control, impossibility for identification because of damaged packages and missing labels. The Invetory in 1996 found out the availability of 77215 kg POPs pesticides with gratest amount being Toxaphene (34954 kg).

The inventory done by Ministry of agriculture and forestry in 2000 found out a total amount of POPs pesticides was about 57,85 t stored in 99 sites on the territory of 22 districts. A part of them- 22.25 t was identified as POPs and the balance of 35.6 t were mixture of pesticides consisting of or contaminated with POPs stored in 38 sites, on the territory of 10 districts.

The inventory in 2000 found out availability of obsolete POPs pesticides and mixtures, containing or contaminated with POPs, but the amounts differed from those declared in 1995 and 1996.

The greatest amount were the mixtures of POPs pesticides with unknown composition, followed up by DDT and heptachlor.These figures were not considered as definitive due to absence of data on the quantity of banned OC pesticides stored on the territory of 6 districts (Sofia & Sofia district, Burgas, V.Tarnovo, Targovishte & Sliven) and damaged packages and missing labels.

In August 2000, samples were taken from 8 warehouses for prohibited or obsolete pesticides in 4 regions of Bulgaria of approximately 41,2 tons of POP pesticides with assumed content of DDT, aldrin, dieldrin, toxaphene and endrin. The sample analysis has proven presence of DDT, aldrin, and dieldrin in approx. 28 t of POP pesticides. The identified POP pesticides have been re-packed in new drums, labelled in compliance with the European requirements, and transported to a base site. Under the project „Destruction of Risk Pesticides from Bulgaria in the Netherlands", 27680 kg of POP pesticides

such as DDT, aldrin and dieldrin from Bulgaria's regions Sofia, Plovdiv, Shumen and Burgas have been exported to Netherlands, and destroyed in an incinerator in Rotterdam.

Table 21 summarizes the date for available the POP pesticide stocks existing in Bulgaria by 1995 , 1996 and 2000 (according to the document-based inventory, without on-site analyses and visits), the POP pesticides exported in July 2000 for disposal abroad and the probable POPs pesticides stockpiles existing by 2003.

Table 21. Assumed POPs stocks and mixtures, consisting of or contaminated with POPs at end of 2003

POPs pesticides and mixtures	**Documentary** declared POPs pesticides **in 1995**[1]	**POPs** Pesticides Inventory **1996**[2]	**Documentary** declared POPs pesticides **in 2000**[3]	**Assumed** total POPs pesticides stockpiles **in 2000**	**Exported** for disposal in Hollandi, **July 2000**	**Assumed stocks** of POPs pesticides and mixtures, after export to Holland, **December 2003**	
	kg	kg	kg	kg	kg	kg	
ALDRIN	4926	1563	1395	4926	3531	1395	
DIELDRIN	1726	528	1595	1726	131	1595	
ENDRIN	20	200	204	204	-	204	
TOXAPHENE	205	34954	720	720	-	720	22 255
HEPTACHLOR	11156	11156	7592	11156	-	7592	÷25 819
DDT	29234	28814	10749	29234	18485	10749	
POPs total	**47267**	**77215**	**22255**	**47966**	**22147**	**22255**	
Mixture	n.a.	n.a.	35591	35591	5533	30058	30058
TOTAL	**47267**	**77215**	**57846**	**83557**	**27680**	**52313**	**2313÷55877**

1 *Documentary inventory in 1995 („Analysis and prospects for use of POPs in Bulgaria ,1995 IVECOL Sole Proprietor, Sofia, 1997)*

2 *Tasheva M, POPs Inventory 1996, National Centre of Hygiene, Medical Ecology & Nutrition,Training Workshop on POPs Inventories regarding NIPdevelopment, Dec.2003,Sofia,Bulgaria*

3 *Documentary inventory in 2000 (Kamburova V.„„Impact of Obsolete pesticides on rural environment", Journal of Balkan Ecology, Vol.7, No4, 2004, p.425)*

From the assessment of available data for POPs pesticides stockpiles, collected by the Inventories carried out within the years, it could be assumed the following:

The assumed POPs stockpiles at the end of 2003 are in the range of 22.25 t ỳ 25.82 t and the mixtures, consisting of or contaminated with POPs comprise of approx. 30.06 t, totaling the assumed POPs stockpiles between 52.3 t ỳ 55.88 t. Due to different data declared within the POPs Invetories, carried out in 1995, 1996 and 2000 by various authorities, it is required a detailed POPs Inventory to be implemented in Bulgaria. To identify the specific POPs amount in the obsolete stockpiles and mixtures, it is necessary to determine the actual POPs content by sampling and analysis.

Concusions:

The assumed POPs pesticides stockpiles at the end of 2003 in Bulgaria are in the range of 22.25 t ÷25.82 t.

- The obsolete pesticides mixtures, consisting of or contaminated with POPs comprise of approx. 30.06 t.
- The assumed POPs pesticides stockpiles are totaling between 52.3 t ч 55.9 t
- To identify the specific POPs pesticides, a detailed POPs Inventory is required to be carried out in Bulgaria.

2.3.2.6. Obsolete pesticides stockpiles

The storage facilities for unusable and obsolete pesticides are a source of local environmental pollution.

By initiative of the EEPA at the MOEW, in 2000 the RIEW jointly with the municipal administrations and plant protection services have inspected the number and staus of warehouses and obsolete pesticides stored in them.

Using information cards, the RIEW collect every year and submit to the EEA information about the warehouses status and the obsolete pesticides stockpiles. The Interagency Expert Committee at the MoAF, with participation of MOEW's representatives discusses and takes decisions on all activities regarding the facilities for storage of prohibited and obsolete pesticides.

The obsolete and useless pesticides are stored in centralized and municipal storage facilities and BB-cubes (reinforced steel containers 195x195x195 cm in size, hermetically sealed, with an effective storage capacity of 5 m^3).

2.3.2.6.1.Inventory results for the period 2001-2004

In the period 2001 – 2004 MOEW through its EEA and RIEWs continued the monitoring of the warehouses status and of the obsolete pesticides stored there *(fig.9)*.

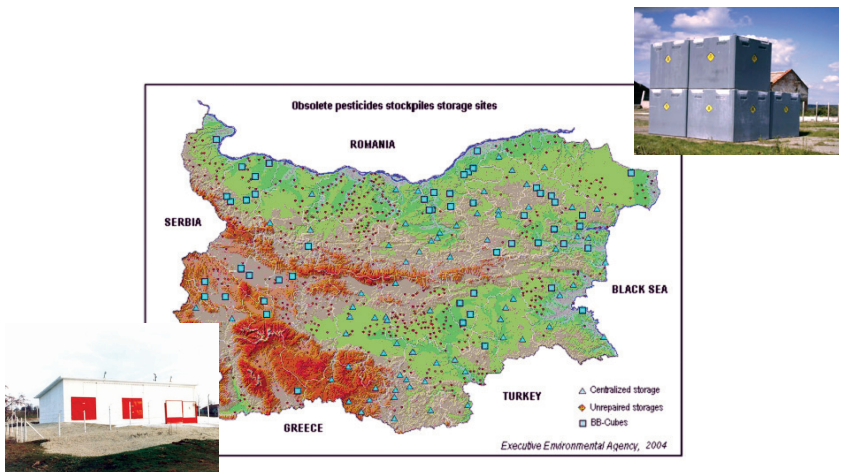


Figure 9. Distribution of warehouses and BB-cubes for storage of obsolete and useless pesticides on the territory of R Bulgaria for 2003.

At the end of 2003 the total number of storage facilities is 651, located on 618 lands of 198 municipalities.It has been identified totally 72 centralized storages - repaired or new buildings, complying with the requirement of safe storage of hazardous wastes as well as 55 sites with 957 BB-cubes. 579 unrepaired operating since 60-ies of past century storages for obsolete and useless pesticides are located on 550 lands of 154 municipalities. The latter do not comply with the requirements for safe storage and are a potential source of environmental pollution.

At the end of 2004 the total number of storage facilities is 561, out of which being 84 centralized and 477 operating unrepaired storehouses.The 477 unrepaired storage facilities for obsolete pesticides are located on 460 lands of 130 municipalities. In 19 districts are located 1255 BB cubes. The number of centralized storages in 2004 compared with 2003 has increased with 12, and that of BB cubes – with 298. At the same time the number of unrepaired warehouses has been reduced with 102. In 2004 113 storages out of 579 unrepared ones in 2003 has been demolished and 24 new obsolete pesticides warehouses has been discovered.

At the end of 2003 total stockpiles of obsolete pesticides are 12394 t, as 28% of them are permanently disposed in 957 BB-cubes, and 39% are re-packed and transferred in 72 centralized storage facilities.

In 2004 the total stockpiles of obsolete pesticides are 11222 t, as 37,2% of them are permanently disposed in 1255 BB-cubes, and 41,9% arestored safely in 84 centralized storage facilities.Compared to 2003, the total OP stockpiles has been reduced with 1172 t, the repacked and moved to centralized storehouses OP has increased with 47 t, and that in BB cubes – with 652 t. (*Fig.10*).

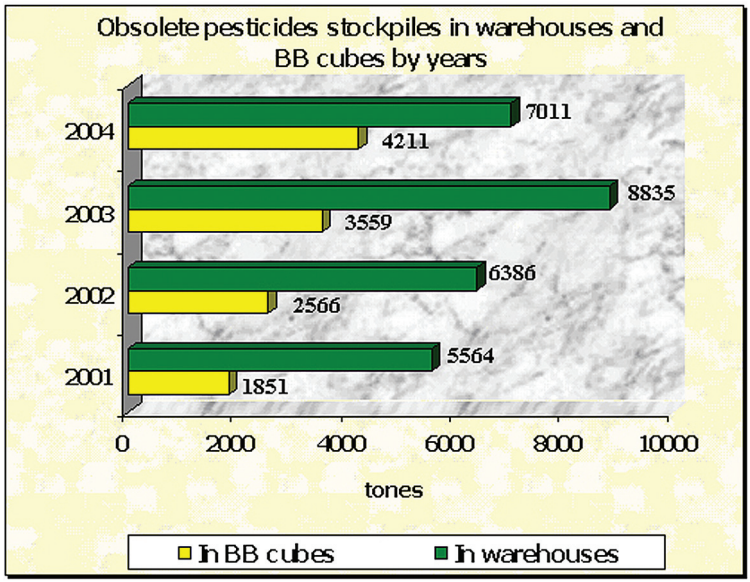


Figure 10. Obsolete pesticides stockpiles for 2001-2004.

The ownership of warehouses is state, municipal, cooperative and private.

The largest share **in 2003** was held by the cooperative property – 52%, followed by municipal – 30%, private – 14%, and state – 4%.

In 2004 the largest share in was held by the cooperative property – 58,17%, followed by municipal – 24,4%, private – 14,6%, and state – 2,8%. In comparison with 2003, it is observed an increase of storage facilities cooperative ownership and decrease of those municipal and state ownership. (*fig.11*).

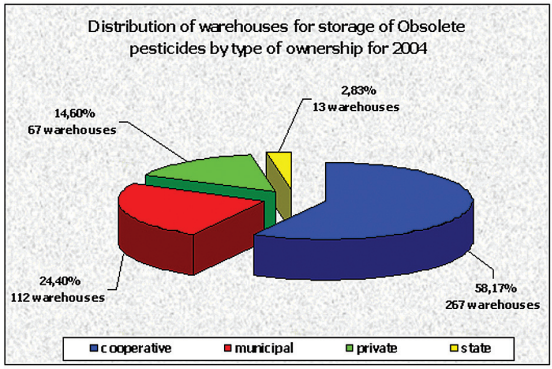


Figure 11. Distribution of warehouses for storage of Obsolete pesticides by type of ownership for 2004.

In 2003 approximately 46% of all warehouses are safe-guarded. Approx. 52% of storages are in an unsatisfactory or poor condition. 66% of all obsolete and useless pesticides stockpiles are stored safely in centralised storages and in BB cubes. The remaining 34% are stored in operating unrepaired warehouses which will be repaired and cleaned gradually, and those in poor status will be liquidated, and their sites and buildings sanitated.(*fig.12*).

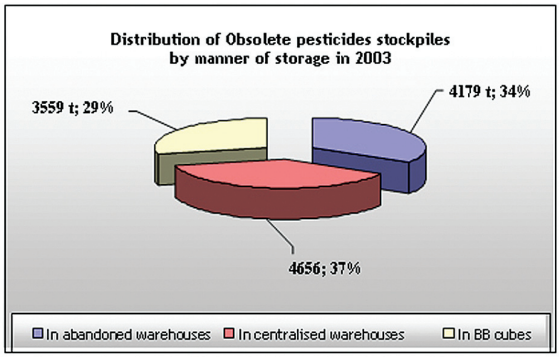


Figure 12. Distribution of Obsolete pesticides stockpiles by manner of storage for 2003

In 2004 the safe-guarded storages has decreased from 46% in 2003 to 38% in 2004, probably because of limited financial resourses of the municipalities, responsible for safe-guarding of warehouses. The total obsolete pesticides stockpiles, stored safely in centralised storages and in BB cubes has increased – from 66% in 2003 to 79% in 2004. The obsolete pesticides stockpiles , stored in operating unrepaired warehouses decreases from 37% in 2003 to 21% in 2004 (*fig.13)*.

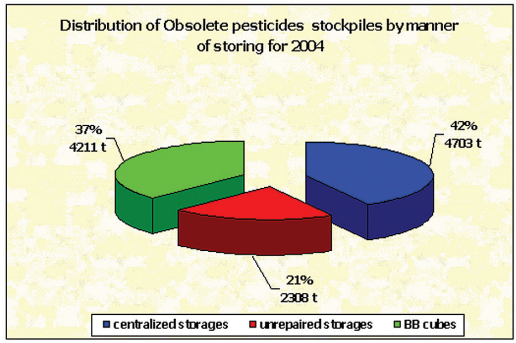


Figure 13. Distribution of Obsolete pesticides stockpiles by manner of storing for 2004.

In 2001 were repaired 124 warehouse in municipalities: Smolyan, Veliko Tarnovo, Kirkovo, Ardino, Burgas, Kubrat, Bobov dol, Tryavna, Yambol, Mizia, Svishtov and Targovishte.

In 2002 were repaired warehouses in municipalities:Sredets, Kameno, Provadia, Avren, Aksakovo, Krivodol, Yakimovo, Brusartsi, Valche Dram, Chiprovtsi, Georgi Damyanovo, Kneja, Samokov, Krumovgrad, Harmanli and Kardjali.

In 2003 were repaired warehouses in municipalities: Hisar, Brezovo, Saedinenie, Loznitza, Kardjali, Rodopi, Samoil, Belene, Haskovo, Dimitrovgrad, Svishtov, Lukovit, Antonovo, Kneja, Zavet, Kozloduy and Pleven. Obsolete pesticides encapsulated in BB cubes in municipalities: Aksakovo, Sliven, Avren, Krichim, Opaka, Suvorovo, Gorna Malina, Sungurlare, Samokov, Shumen, Veliki Preslav, Nikola Kozlevo, Vidin, Kaspichan and Novi Pazar and Ruse district. More than 80 warehouses have been eliminated and cleaned up in 2003, and due to improved control and better identification more than 90 new storages have been discovered. The problem for safe storage of obsolete pesticides has been completely solved in the following administrative areas: Yambol, Smolyan, Russe, Gabrovo. Almost completely it is solved in Veliko Tarnovo, Kardzhali, Razgrad, Sliven, Targovishte.

In 2004 are concluded 7 contracts for repairing of warehouse in municipalities: Saedinenie, Rakovski, Radnevo, Vetrino, Kaloyanovo, Maritza and Asenovgrad. In BB cubes obsolete pesticides are stored in 23 municipalities. The number of centralized storages in 2004 compared with 2003 has increased with 12, and that of BB cubes – with 298. At the same time the number of unrepaired warehouses has been reduced with 102. In 2004,113 storages out of 579 unrepared ones in 2003 has been demolished and 24 new obsolete pesticides warehouses has been discovered.

The obsolete pesticides in 100 municipalities have been collected safely, treated with inert materials, re-packed, transported and stored in reinforced concrete containers – BB cubes – or in repaired warehouses .

The increased activity towards permanent and environmental sound disposal of obsolete and useless pesticides in newly built or repaired centralized warehouses and BB cubes for the period 2001 ч 2004 is shown in comparative *Table 22*.

In 2003 , 15 new sites with 247 new BB cubes with approx. 993 t of obsolete pesticides capsulated, had been established. At the same time the number of centralized newly built or totally repaired warehouses for obsolete pesticides, complying with the requirements for safe storage increases from 37 in 2002 to 72 in 2003. At the same time the number of unrepaired warehouse in bad status decrease respectively from 678 to 579 .

In 2004 **, 298 new BB cubes with approx. 652 t of obsolete pesticides capsulated had been established. At the same time the number of centralized newly built or totally repaired warehouses for obsolete pesticides, complying with the requirements for safe storage increases from 72 in 2003 to 84 in 2004. The number of unrepaired warehouse in bad status decrease respectively from 579 to 477, representing 18% decline versus 2003. (*Fig 14*).**

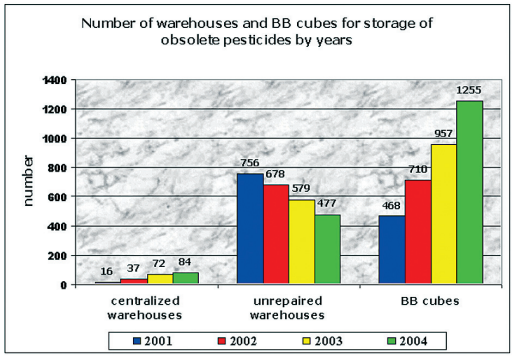


Figure 14. Number of warehouses and BB cubes for storage of obsolete pesticides by years

Table 22. Total obsolete pesticides stockpiles in storages facilities by types of warehouse and BB cubes for the period 2001-2004 in Bulgaria

Year	Storage facilities for obsolete pesticides			„known" Obsolete pesticides in warehouses	„unknown" Obsolete pesticides in warehouses	Obsolete pesticides in warehouses	BB cubes sites	BB cubes	„unknown" Obsolete pesticides in BB cubes	„unknown" Obsolete pesticides in warehouses & BB cubes	Obsolete pesticides in warehouses & BB cubes
	TOTAL	Centra-lized	Unrepair. operating	Q/ty	Q/ty	Total			Total	TOTAL	TOTAL
	number			tones	tones	tones	number	number	tones	tones	tones
2001	**772**	16	756	2138	3427	**5565**	20	**468**	1851	**5278**	**7416**
2002	**715**	37	678	1955	4431	**6386**	40	**710**	2566	**6997**	**8952**
2003	**651**	72	579	12	8823	**8835**	55	**957**	3559	**12382**	**12394**
2004	**561**	84	477	2,8	7008,2	**7011**	60	**1255**	4210,5	**11218,7**	**11221,5**

The „unknown" obsolete pesticides stockpiles in warehouses and in BB cubes have been increasing constantly in the period **2001-2003**, due to annual discoveries of new quantities of obsolete pesticides, being hazardous waste.

The „unknown" obsolete pesticides **in 2003** have increased to 12382 tonnes (*Fig. 15)*.
In 2004 a decline of OP stockpiles have been observed from 12382 t to 11222 t.

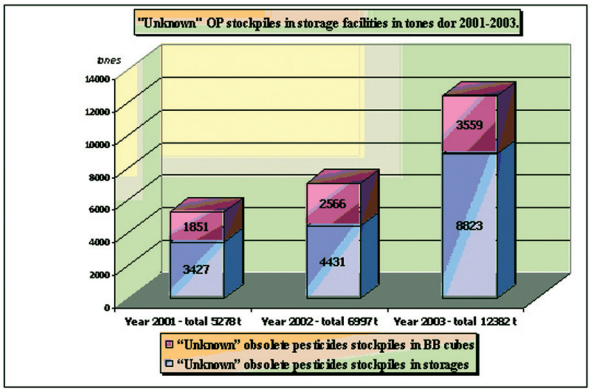


Figure 15. „Unknown" Obsolete pesticides stockpiles in storage facilities in tones for 2001-2003

The distribution of „unknown" obsolete pesticides stockpiles (in kgs), stored in centralized and operating unrepaired warehouses and capsulated in BB cubes for 2003 and 2004 by administrative districts is shown on *Table 23 and table 24*.

In 2003, the obsolete pesticides stored in centralized 72 warehouses, located in 18 administrative districts amount to 4656 tonnes, that encapsulated in 957 BB cubes on 55 sites is 3559 tonnes, located in 15 administrative districts. The total obsolete pesticides stockpiles stored in safe warehouses, conforming to all requirements and in BB cubes is 8215 tonnes. The quantity of „unknown" obsolete pesticides is 4167 tonnes, stored in 579 unrepaired warehouses *(table 23)*.

Table 23. „Unknown" obsolete pesticides in various storage facilities by districts for 2003 in R Bulgaria

District	In Centralized warehouses		In Unrepaired operating warehouses		In BB cubes			Total quantity kg
	number	Quantity, kg	number	Quantity, kg	Sites, number	BB cubes, number	Quantity, kg	
Blagoevgrad			22	77790	1	4	20000	**97790**
Bourgas	4	212215	41	140750	3	41	197000	**549965**
Varna	6	212330	11	80100	4	64	137150	**429580**
Veliko Tarnovo	7	1043075	6	33863	3	22	60000	**1136938**
Vidin			22	208930	1	27	108000	**316930**
Vratza	1	291185	21	162900				**454085**
Gabrovo	3	82979						**82979**
Dobrich			31	266010	2	89	353600	**619610**
Kardjali	8	316849	4	11335				**328184**
Kyustendil	1	432371	2	385911				**818282**
Lovech	1	66400	42	174350				**240750**
Montana	1	92000	20	103785	7	119	476000	**671785**
Pazardjik			23	54171				**54171**
Pernik			11	853150	3	63	252000	**1105150**
Pleven	3	105951	91	324742				**430693**
Plovdiv	9	389055	20	128745				**517800**
Razgrad	5	126417	4	75593				**202010**
Russe					7	85	190897	**190897**
Silistra	1	39225	21	78795				**118020**
Sliven			4	2980	5	175	862000	**864980**
Smolyan	6	99970						**99970**
Sofia			40	367414	7	64	256000	**623414**
Stara Zagora	2	34000	88	300628				**334628**
Targovishte	3	105745	3	94270	1	8	27000	**227015**
Haskovo	5	571340	35	80566	1	50	103000	**754906**
Shumen	1	8054	17	159989	9	100	281300	**449343**
Yambol	5	426700			1	46	235000	**661700**
TOTAL	**72**	**4655861**	**579**	**4166767**	**55**	**957**	**3558947**	**12381575**

Table 24 „unknown" obsolete pesticides stockpiles, stored in centralized and unrepaired operating warehouses and BB cubes by districts for 2004.

District	In centralized storehouses		In unrepaired operating warehouses		Total	Total	Liquidated	In BB cubes		TOTAL
	Warehouses	Q/ty	Warehouses	Q/ty	Warehouses	Q/ty	Warehouses	Cubes	Q/ty	kg
	nr	kg	nr	kg	nr	kg	nr	nr	kg	
Blagoevgrad			**17**	66340	**17**	**66340**	**4**	**11**	42300	**108640**
Burgas	**3**	152100	**27**	113033	**30**	**265133**	**20**	**123**	511240	**776373**
Varna	**6**	213330	**3**	62600	**9**	**275930**	**8**	**70**	161150	**437080**
V.Tarnovo	**9**	1046675	**8**	41368	**17**	**1088043**	**0**	**11**	30000	**1118043**
Vidin			**14**	66940	**14**	**66940**	**6**	**45**	174000	**240940**
Vratza	**1**	291185	**23**	176100	**24**	**467285**	**0**			**467285**
Gabrovo	**3**	82979			**3**	**82979**				**82979**
Dobrich			**23**	102760	**23**	**102760**	**8**	**131**	506600	**609360**
Kardjali	**8**	316849	**4**	11335	**12**	**328184**	**0**			**328184**
Kyustendil	**3**	129102			**3**	**129102**				**129102**
Lovech	**1**	66400	**42**	174350	**43**	**240750**	**3**			**240750**
Montana			**17**	63640	**17**	**63640**	**10**	**177**	596000	**659640**
Pazardjik			**19**	45521	**19**	**45521**	**4**	**1**	1370	**46891**
Pernik			**12**	56636	**12**	**56636**	**0**	**49**	196000	**252636**
Pleven	**3**	105951	**89**	340712	**92**	**446663**	**4**			**446663**
Plovdiv	**13**	585342	**3**	38600	**16**	**623942**	**14**	**6**	36600	**660542**
Razgrad	**5**	116655	**1**	6250	**6**	**122905**	**1**			**122905**
Ruse	**4**	84187			**4**	**84187**		**111**	235197	**319384**
Silistra	**1**	39225	**21**	85485	**22**	**124710**	**2**			**124710**
Sliven			**4**	3455	**4**	**3455**	**1**	**176**	864400	**867855**
Smoljan	**5**	94170			**5**	**94170**		**1**	5000	**99170**
Sofia			**40**	367414	**40**	**367414**	**0**	**64**	256000	**623414**
Stara Zagora	**4**	188745	**57**	229651	**61**	**418396**	**27**	**69**	341000	**759396**
Targovishte	**4**	184145	**3**	7600	**7**	**191745**	**1**	**14**	18300	**210045**
Haskovo	**5**	571340	**35**	94766	**40**	**666106**	**0**	**50**	103000	**769106**
Shumen	**1**	8050	**15**	153624	**16**	**161674**	**0**	**100**	281300	**442974**
Yambol	**5**	426700			**5**	**426700**		**46**	235000	**661700**
TOTAL	**84**	**4703130**	**477**	**2308180**	**561**	**7011310**	**113**	**1255**	**4210487**	**11221797**

In 2004, the obsolete pesticides stockpiles in the centralized 84 warehouses is 4703 t and that, capsulated in 1255 BB cubes – 4211 t, located on the territory of 19 districts. Total obsolete pesticides stockpiles stored in safe and in conformity to all requirements warehouses and in BB cubes comprises to 8914 t. *(table 24)*.

The amount of „unknown" obsolete pesticides stored in 477 unrepaired and unsafe warehouses is 2308 t.These stockpiles pose risk to the environment. The insufficient information about the assumed available approx. 52.3 t ч 55.9 t obsolete POPs pesticides and mixtures, consisting of or contaminated with POPs, due to torn packages, lack of labels and impossibility to identify their composition requires the implementation of detailed inventory of „unknown" OP stockpiles of 2308 t, stored in 477 unrepaired warehouses. The poor status of 53% of unrepaired operating storages requires measures for safe storage of the available there 1223 t obsolete pesticides – repacking and moving in repaired warehouses or export for disposal abroad.

Conclusions:

Obsolete pesticides stockpiles in 2003

- At the end of 2003 the total amount of obsolete pesticides stockpiles is 12394 t, stored in 651 warehouses and 957 BB-cubes.
- The „unknown" obsolete pesticides comprise of 12382 t, out of which 4656 t are stored in 72 centralized warehouses, 4167 t – in 579 unrepaired storages and 3559 t – in BB-cubes.
- Total obsolete pesticides stockpiles stored in safe warehouses, conforming to all European requirements for safe and environmentally sound storage of hazardous waste and in BB cubes is 8215 t.
- The amount of „unknown" obsolete pesticides stored in 579 unrepaired and unsafe warehouses is 4167 t.

Obsolete pesticides stockpiles in 2004

- At the end of 2004 the total amount of obsolete pesticides stockpiles is 11222 t, stored in 561 warehouses and 1255 BB-cubes.
- The „unknown" obsolete pesticides comprise of 11219 t, out of which 4703 t are stored in 84 centralized warehouses, 2308t – in 477 unrepaired storages and 4211t – in 1255 BB-cubes.
- Total obsolete pesticides stockpiles stored in safe warehouses, conforming to all European requirements for safe and environmentally sound storage of hazardous waste and in BB cubes is 8914 t.
- The amount of „unknown" obsolete pesticides stored in 477 unrepaired and unsafe warehouses is 2308 t.
- The insufficient information about the assumed available approx. 52.3 t ч 55.9 t obsolete POPs pesticides and mixtures, consisting of or contaminated with POPs, contained exactly in these 2308t obsolete pesticides requires the implementation of detailed inventory of the „unknown" obsolete pesticides, stored in 477 unrepaired warehouses

2.3.2.7. Existing policy and regulatory framework

2.3.2.7.1. Existing policy

The management of POPs pesticides in R Bulgaria is implemented in conformity to the adopted and effective regulations, mechanisms and procedures. Their enforcement guarantees prevention to the maximum extend the negative impact of POPs pesticides on human health and the environment.

The storage facilities for obsolete and unusable pesticides are one of the sources for local environmental pollution and pose health risk.To solve the problem of safe storage of obsolete and unusable pesticides in Bulgaria, with Order RD-159/12.05.1998 of the Ministry of Environment and Water and Order RD-09-991/11.05.1998 of the Ministry of Agriculture and Forests it was created an Inter-Agency Expert Committee for the management of „prohibited, obsolete and unusable pesticides stockpiles".

The responsible institutions for POPs pesticides management are the Ministry of Agriculture and Forestry (MoAF), the Ministry of Environment and Water (MoEW), and their regional structures. The main regulatory framework applied are the Waste Management Act (promulgated in the SG 86/ 24.09.2003, amended SG 70/10.08.2004), Regulation 12 on the Requirements for the Sites for Waste Treatment Facilities, promulgated SG 152/22.12.1998 and Regulation 13 on the Conditions and Requirements for Construction and Operation of Waste Landfills, promulgated SG 152/22.12.1998 and the National Waste Management Programme.

The construction of centralized municipal warehouses and BB cubes conforming to the legislative requirements for safe disposal, liable storage of available obsolete pesticides stockpiles and cleaning up of emptied warehouses are activities that illustrate consistency in environmental protection policy and sustainable management of obsolete pesticides.

The funds allocated by the Enterpise for Management of Environmental Protection Activities (EMEPA) and National Plant Protection Service (NPPS) have been increasing constantly during the peirod 1998 - 2004 for safe storage of obsolete & unusable pesticides, repairing of warehouses, cleaning up of premises and sites, collection, re-packing, and shifting of chemicals from warehouses in the small urban centres to municipal and centralised warehouses, or disposal in BB cubes. The decreasing of old warehouses and the environmentally sound storage of obsolete pesticides has reduced the threat of environmental pollution and human health risk (*Fig.16*).

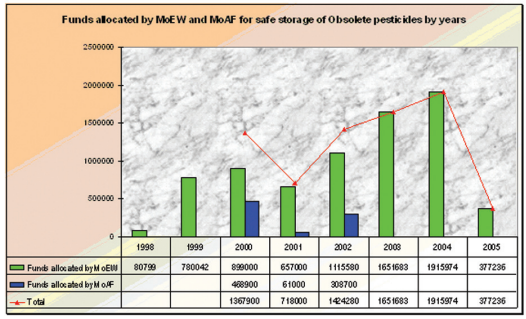


Figure 16. Funds allocated by MoEW and MoAF for safe storage of obsolete pesticides in BGN by years

During the period 2001 - 2004, steady positive trends toward the management of warehouse for banned and obsolete pesticides and the surrounding areas are observed as a result of:

- restriction of existing and prevention of future pollution in cosequence of the effective enforcement of national legislation;
- restriction of negative impact of warehouses and obsolete pesticide stored there upon environmental quality and human health by re-packing, and shifting in centralised municipal warehouses and cleaning up of emptied premises (*picture 1 & 2*);

Picture 1. Unrepaired municipal warehouses for obsolete pesticides

permanent disposal of obsolete pesticides in BB cubes with upto 300 years waste storage term (*photo 3*);

maintaining and annual updating of Obsolete pesticides stockpiles data base, stored in warehouse and BB cubes on national (in EEA) and regional (in RIEWs) level;

finacing of project proposals /programmes for improvement of storage facilities status and safe and environmentally sound storage of Obsolete pesticides;

Picture 2. Repaired storage for obosolete pesticides

Picture 3 BB cube site

- public awareness rising and providing public access to the available information.

To improve the storage conditions of obsolete and unusable pesticides, the following measures have been taken:

- **In 2003** are concluded 18 contracts for repairing of warehouse in municipalities. Obsolete pesticides encapsulated in BB cubes in municipalities: Aksakovo, Sliven, Avren, Krichim, Opaka, Suvorovo, Gorna Malina, Sungurlare, Samokov, Shumen, Veliki Preslav, Nikola Kozlevo, Vidin, Kaspichan and Novi Pazar.
- **In 2004** are concluded 7 contracts for repairing of warehouse in municipalities. In BB cubes obsolete pesticides are stored in the municipalities: Kula, Boichinovtzi, Pravetz, Varna, Nessebar, Kubrat, Karnobat, Chuprene, Sofia city, Opaka, Sredetz, Montana, Opan, Stara Zagora, Rakitovo, Shabla, Bansko, Kostenetz, Lom, Medkovetz, Isperih, Kavarna and Ruen;
- **In 2005** are concluded 6 contracts for repairing of warehouse in municipalities: Lukovit, Radnevo, Hisar, Nikopol, Haskovo and district Stara Zagora. In BB cubes obsolete pesticides are stored in the municipalities: Gramada, Ardino, Stara Zagora, Kubrat, Berkovitza, Balchik, Novi Pazar, Dolna Mitropolia, Pleven, Boinitza, Karnobat, V.Preslav, Blagoevgrad and Polski Trambej.
- **The total allocated funds** by MoEW/EMEPA for safe storage of obsolete pesticides for the period 1998-2005 amount to 7,5 million BGN, as only for 2004 they are almost 2 million BGN.

Nevertheless the annually constantly increased funds allocated by state budget for the management of POPs and obsolete pesticides , the Republic of Bulgaria can not cope alone with final solving of POPs and Obsolete pesticides stockpiles without international financial support, due to limited national funding available and the fact that Bulgaria is in Currency Board. To reduce the risk of POPs pesticides impacts on human health and the environment measures should be taken for safe storage and/or environmentally sound disposal abroad, due to absence of appropriate disposal facility in the country. For this purpose the Republic of Bulgaria needs to be supported by providing financial resources from GEF and other international, bilateral, regional and multilateral twinning programmes.

2.3.2.7.2. Existing national legislation

The observation of existing national legislation in regard with POPs pesticides management guarantee the reducing of POPs negative impacts on environment and human health

1.Standards for POP pesticides in soils

- **Regulation 3** on the Admissible Content of Harmful Substances in Soils, promulgated SG 36/08.05.1979, amended SG 54/1997, last amendment SG 39/16.04.2002.

- Admissible Limit Values (ALV) for Hexachlorobenzene, DDT and metabolites in soil, defined on the grounds of risk assessment and their effects on the environment and human health at two level: Precautionary Levels and Admissible Limit Values.

2.Limit Values for POPs Pesticides in Water

- **Regulation 12** on the Quality Requirements for Surface Water meant for Drinking Water Supply, promulgated SG 63/28.06.2002.

- Admmissible limit values (ALVs) for POP pesticides in drinking water and the mandatory levels in surface water;

- The ALVs for POP pesticides in drinking water will become effective as of 01.01.2007.

● **Regulation 4** on the quality of waters supporting fish and shellfish organisms' life , promulgated SG 88/27.10.2000.

- Guide and mandatory values for DDT - total, Aldrin and Hexachlorobenzene in surface fresh water inhabited by fish;
- Guide values for DDT - total, Dieldrine , Endrine and Hexachlorobenzene in surface fresh water inhabited by shellfish organisms.

● **Regulation 1** on the Studying, Use and Protection of Ground Water, promulgated SG 57/ 14.07.2000.

- Recommended Parameters (Ecological threshold and Pollution threshold)for Protection of Ground Water against Pollution with POP Pesticides.

3. Maximum admissible concentration of POPs pesticides in fodders

● **Regulation 24** for maximum admissible concentration of unacceptable substances and products in fodders, promulgated SG 56/20.06.2003.

- Maximum admissible concentration of POPs pesticides in fodders.

4.Standards for POP pesticides in food

● **Regulation 6** for the control measures on residues of veterinary medicinal products and environmental pollutants in life animals and foodstuffs of animal origin, promulgated SG 32/29.03.2002.

- Residues groups, subject to control - Chloroorganic compounds, including PCBs;
- Groups of substances to be detected by animal species and products of animal origin- Chloroorganic compounds, including PCBs.

● **Regulation 31** on the maximum admissible quantities of pesticide residue in food, promulgated SG 14/2004, effective 20.02.2004.

- Maximum admissible residual concentrations /MARC/ of POPs pesticides in food.

● **Regulation 31** on the maximum admissible quantities of pollutants in food, promulgated SG 88/08.10.2004.

● **Regulation 25** on the establishment of maximum residue limits of veterinary medicinal products in foodstufs of animal origin, intended for human consumption, promulgated SG 94/ 4.10.2002 .

2.3.2.8. POPs pesticides Monitoring

The monitoring of POPs pesticides in the invironmental media is implemented through NASEM. The management of the National Automatic System for Environmental Monitoring is carried out by the Executive Environment Agency /EEA/, which is a structure under the Minister of Environment and Water.This system, which covers the whole country, is supported by an information database at the national and regional level. It comprises e.g. monitoring data on:

– ambient air quality and emissions of pollutants to air;
– surface and ground water quality;
– subsurface (soil) quality;
– hazardous, industrial, municipal and construction waste.

2.3.2.8.1. POPs pesticides Level in the environment

2.3.2.8.1.1.POPs levels in water

A National System for Environmental Monitoring operates on national level. The National Water Monitoring System shall be a complex of specific control, measurement, analytical and information activities which make it possible to assess and forecast water quantity and quality. The National Water Monitoring System for the surface and groundwater quality is a basic component of it.

Surface water

The national network for monitoring surface water quality comprises 253 stations covering all major river basins. Three of these stations, located on the rivers Struma, Mesta and Maritza, are automatic. Of the surface water stations, 185 are in rivers (ten in the Danube), eight in lakes, 26 in reservoirs and 24 in the Black Sea. A part of the National Water Monitoring System for the surface water (111 points of rivers and all dams) is included in the European Water Net for surface water monitoring (EUROWATERNET).

Fresh water measurements are made for some 30 parameters, including quantity, temperature, DO, BOD, COD, NH4, NO2, NO3, total N, PO4, total P, heavy metals, detergents and hydrocarbons. Measurements are taken once a month in rivers and lakes and seven times a year in the Black Sea.

Within the period 1992-1993 an investigation of Danube river waters had been implemented in the region of town Silistra. From 2 riverside points and 6 thalweg points, it had been analyzed samples with broad spectrum of parameters, including POPs pesticides. In 2 of the analyzed samples was found Heptachlor and p,p'- DDE residues respectively 0,004 mg/l and 0,003 mg/l, considerably lower than the ALVs (0,01 mg/l). *Residues of p,p'-DDT, o,p'-DDT and Dieldrin had not been detected*.[1]

During the period of 1995-1997, the „ Danube Pesticide Regional Study", a project supported by PHARE was completed. The data on the presence of pesticides residues in the water were collected from 10 Danube countries, including Bulgaria. *The data indicated that the levels of DDT in Bulgarian section of the Danube dropped considerably* between the 70-ties and 90-ies from 0,098 mg/l to 0,001 mg/l.[2] *It was not found presence of other POPs pesticides*.

NCHMEN(NCPHP) had carried out investigations on pesticides residues in underground and surface water from 68 water bodies (rivers, wells, irrigation waters, dam lake of drinking water). One to four samples were examined for each water body or totally 176 samples for the period 1993ч1999. Twenty drinking water sources were examined including 3 dams lake for drinking water supply and 17 underground water sources. Forty eight non-drinking water bodies were investigated including 6 of the biggest Bulgarian rivers – Iskar, Ogosta, Yantra, Vit, Maritza and Struma rivers as well as lakes, irrigation dams, drilling wells, etc. One hundred and fifty six samples were examined for POPs pesticides.

No positive samples of POPs pesticides in surface water sources, used for drinking water supply (dam lakes) were found. The classic representative of persistent organochlorine insecticide – DDT and its methabolites showed clear trend for decrease of DDT and its methabolites in hydrosphere of Bulgaria. In 70-ies of past century this POP chemical was found in amount range 0,023ч0,410 mg/l, in 80-ies respectively - 0,013ч0,150 mg/l, while *at present DDT is found only at incidental point pollution and DDE – in rare cases (176/2) in non-drinking waters.*

1 Gopina G.et al., Health-Hygiene Characteristics of the Danube River in the district of Silistra with basic receiver the Black Sea, 1996, Hygiene and Public Health, vol. XXXIX, pp 25-27.

2 Bratanova Z. et al., A review of Existing data on occurance of Pesticides in water of the River Danube and its tributaries, 1998, Fresenius Envir.Bull.,7:495-501.

No positive samples of POPs pesticides in surface water sources, used for drinking water supply (dam lakes) were found.

Ground water

The national network for monitoring ground water quality is made up of 225 stations. They are sampled two or four times a year for about 30 parameters. Bulgaria reports monitoring results from 74 ground water stations to the EUROWATERNET system.

Groundwater is assessed on the ground of information, collected by Executive Environmental Agency. Once per year in some points pesticides are analyzed.

In the period 1998-2002 two groups of samples have been taken for analysis of pesticides in ground water – at high ground water level in spring time, and low level by the later summer and early autumn. The sampling points in the spring were selected after analysis of the data from previous years – these are points where at least one pesticide exceeded the drinking water level of 0.1 мg/l. The following POPs pesticides had been analyzed - aldrin, dieldrin, endrin, chlordane, heptachlor, hexachlorbenzene and 6 DDT isomers and metabolites. The samples taken for POP pesticides in ground water were 287, and in the year 2002 they were 70. *The analysis of data shows that no ground water in the Republic of Bulgaria is polluted with aldrin, dieldrin, endrin, chlordane, heptachlor and hexachlorobenzene*. Although HCB had not been imported and used as pesticide in R Bulgaria , HCB residues had been found in single points samples being below Ecological threshold , probably due to unintentional emission releases.

The investigation results of DDT and its metabolites indicate that **in 1998** from totally 49 samples, in 8 samples the values exceed the pollution threshold (PT) - 0,1 мg/l and in 26 samples – above ecological threshold (ET) - 0,01 мg/l. The highest levels have been registered in Byala slatina(area of Vratza) - 1,037 мg/l; village of Yakimovo – 0,306 мg/l and village of Septemvriitsi - 0,178 мg/ (area of Montana); the town of Kozloduy(area of Vratsa) – 0,180 мg/l. **For 1999** samples exceeding pollution threshold (PT) are registered in the village of Brushlen (area of Russe) - 0,523 мg/l and the town of Petrich (area of Blagoevgrad.)– 0,263 мg/l. The levels measured in the same points **in 2002** were already below the minimum detection level (MDL). *The analysis and data assessment shows that no groundwater polluted with DDT in the R Bulgaria ehist in 2002. All values were below the minimum detection level (MDL) in 2002 and this classifies the groundwater as ground water in excellent condition.*

In 2003 for the territory of Danube, Black Sea, East Medetiranian and West Medetiranian Basin Regions were analyzed samples for POPs residues in groundwater – aldrin, dieldrin, endrin, HCB, Heptachlor, isomers and metabolites of DDT. All values are below minimum detection level - MDL .

In 2004 an investigation study for the groundwater pollution with POPs pesticides (aldrin, endrin, heptachlor, p,p'-DDT, p,p'-DDE and p,p'-DDD) has been carried out in selected regions with intensive agriculture.It has been tested 103 groundwater sources from 16 regions in Bulgaria, according to available information about past pollution accidents. *It was not found POPs pesticides content in any sample* (LOD of method 0,001мg/l).[1]

1 Bratanova Zl. At al., „Groundwater pollution with pesticides in selected regions in Bulgaria", 2005, Hygiene and health care, XLVIII.

The analysis and data assessment show that during 2004 in R Bulgaria there are no groundwater, polluted with POPs pesticides. POPs pesticide monitoring indicates excellent condition of groundwater on the whole territory of the country.

2.3.2.8.1.2. POPs pesticides level in Soil

Land and soil quality monitoring, managed by the EEA as part of the NASEM, includes the control and protection of soil from pollution with persistent organic pollutants (20 monitoring stations for PAH, PCB and pesticides, and 48 stations for pesticide monitoring).

Data on polluted soils are collected by EEA, together with the Institute of Soil Science and Agroecology. Soil contamination of industrial sites is also monitored using EIA procedures and an environmental auditing system.

In 1997, the EEPA at the MOEW initiated a systematic study of soils for residues of POP pesticides – DDT, hexachlorbenzene, aldrin, chlordane, dieldrin, endrin, heptachlor, mirex – that are prohibited for use in the Republic of Bulgaria. Within the MoEW's **4 years soil monitoring programme** 277 soil samples had been collected and analyzed , 124 of which were in the year **2000**.

In 1997, the soil sampling points had been located in sites of expected pollution. The point selection methodology was changed during the **period 1998-2000**, and the soil samples were equally distributed along the country's agricultural land. For evaluation of the results the established 3 levels of reference values - Precautionary Levels (PL), Admissible Limit Values (ALV) and Intervention Value (IV) for the Content of Prohibited Chloroorganic Pesticides in Soils.

Table 25 present the results from the soil monitoing carried out during the period 1997-2000.

Table 24 Summary of the monitoring data for POPs pesticides levels in soil for the period 1997 - 2000

POPs pesticide	Total samples/ Positive samples	% Positive samples	Min/Max Value mg/kg dry soil	AVL mg/kg dry soil
Aldrin	277/17	6,13	0,000012 ÷ 0,00514	
Dieldrin	277/22	7,94	0,000013 ÷ 0,0513	
Endrin	277/23	8,30	0,000015 ÷ 0,0102	
Heptachlor	277/27	9,74	0,000003 ÷ 0,00237	
Hexachlorobenzene	277/84	30,32	0,00002 ÷ 0,00401	0,25
Total DDT	277/263	94,94	0,00007 ÷ 8,994	1,5

The analysis of data about redisual POP pesticides in soils showed that the registered positive samples of aldrin, dieldrin, endrin and heptachlor towards the total number of tested samples are relatively few, respectively 6.13%, 7.94%, 8.30% and 9.74%. Relatively low maximal values were detected for the 4th POPs pesticides. Although not imported and used as pesticide in Bulgaria, probably as a result of emissions, Hexachlorobenzene (HCB) residues are found in 30.32% of tested soil samples, which are significantly lower than the ALV (0,25 mg/kg in dry soil).

DDT and metabolites

In Bulgaria DDT was banned for import and agriculture and public health use 32 years ago.Out of total 277 tested soil samples, in 14 (5.1%) the DDT total residue level is below the minimum detected level MDL.The data demonstrate that DDT still exists in in the environment of almost all regions of the country (94,94% positive samples – table 21). Most of the positive values (212/76,5%) the level of DDT total was below the precautionary levels (PL 0.3 mg/kg). The DDT total residue level in 38 samples was in the range of 0.3 ÷ 1.5 mg/kg dry soil (13.7%). Residues concentrations of DDT total higher than ALV were registered in 10 soil sampling points (3,6%) and only 3 samples (1.1%) were exceeding the intervention value (IV) of 4 mg/kg dry soil.(*fig.17*).

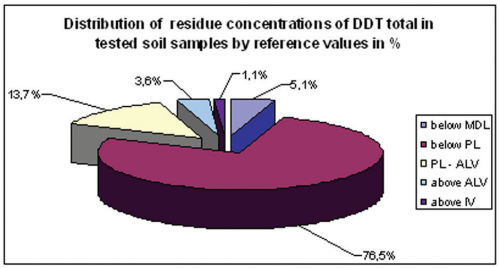


Figure 17 Distribution of DDT total residues in tested soil samples by reference values

Out of all tested 277 soil samples 10 samples (3.6%) contain DDT total>ALV up to 4 mg/kg dry soil, as for 9 samples the level of p,p'-DDE and p,p'-DDT was exceeding ALV (0.5 mg/kg). Higher concentrations were detected in 5 districts as follows – Veliko Tarnovo, Vidin, Montana, Pazardjik and Stara Zagora. The ratio of p,p'-DDE to p,p'-DDT was in the range of 0.53 ÷ 4.35, indicating for increased value of the main metabolite p,p'-DDE, a cerain trend of breakdown and old contamination of soil with DDT. In the soil sample taken from Azadzhiski dol, Montana the ratio of p,p'-DDE to p,p'-DDT was 0.3, indicating a recent soil pollution due to illegal use of DDT after its ban for import and use in 1969.

In 3 soil samples taken from 2 points in Vratza district and in 1 point in Stara Zagora district were registered residue content of DDT total above 4 mg/kg dry soil, amounting 1.1% of total analyzed samples. The ratio of p,p'-DDE to p,p'-DDT was in the range of 0.46 ÷ 5.79 and is an evidence of old soil contamination.

Conclusions:

No soils polluted with the following POPs - aldrin, dieldrin, endrin, heptachlor and hexachlorbenzene exist in all of the studied regions of R Bulgaria.

- DDT and its metabolites still exists in in the environment of almost all regions of the country.
- Most of the positive values (76,5%) of DDT total are below the precautionary levels of 0.3 mg/kg and 13.7% - within the range of 0.3 ỳ 1.5 mg/kg .
- Despite the ban on DDT use since 1969, residues of DDT total higher than admissible limit value of 1.5 mg/kg are registered in 3,6% of soil samples within the period 1997-1999.
- Only 1.1% of samples are exceeding the intervention value of 4 mg/kg. Nevertheless the ratio of p,p'-DDE to p,p'-DDT is an evidence of old soil contamination, new sampling at the same points is required and if necessary remediation measures and clean up sites should be taken.
- The summarized analytical data show that about 95% of soils in the country are not polluted with DDT.

2.3.2.9.POPs pesticides levels in food

The control over the foods is implemented by Ministry of Agriculture and Ferestry and Ministry of Health.The Authorities of State Sanitary Control (SSC) exercise control over all foods , excluding the foods from animal origin.

From the numerous control analysis of different food stuff from vegetable and animal origin (**average 2200 food products for the Year 2003**) made by accredited laboratories of Ministry of Health (MoH) in Bulgaria, it was not found food samples, exceeding the maximum admissible residual concentration (MARC) for POPs pesticides residues in foods.

The National Veterinary Medical Service (NVMS) at the Ministry of Agriculture and Forestry (MoAF) is the national competent authority responsible for the National Monitoring Program for Control on Residues (NMPCR), including POPs in live animals and animal products intendet for human consumption.

In 2003 individual samples are tested for Residues of organochlorine pesticides(aldrine, DDT total, Heptachlor epoxide) and PCBs in live animals and animal products - red meat (slaughtered cattle, pigs, sheep, lambs, goats and kids) poultry(liver, muscle and fat of ducks, goose and hens); fish (fat of trout , carp, silver carp, sturgeon and hausen) ; hen eggs; raw cow and sheep milk; bee honey; farmed (fat of pheasants and rabbits)and wild (fat of rock partridge and wild rabbits) game. The results show that in tested sample there is no presence of POPs pesticides and PCBs residues has been detected.

Conclusions:

No presence of any residues of POPs pesticides exceeding the maximum admissible residual concentration (MARC) in the tested 2200 foodstuffs from vegetable and animal origin for the Year 2003 has been detected.

No presence of any residues from B (3)(a) group organochlorine compounds - organic substances, including such as Aldrin, DDT, Heptahlor epoxide and PCBs in the tested samples of Live Animals, Fresh Meat, Poultry, Fish, Farmed & Wild Game, Raw Milk, Hen Eggs and Bee Honey in Bulgaria for the Year 2003 has been detected.

2.3.2.10. POPs pesticides levels in human body

Under the international project developed by 19 European countries, „WHO-coordinated Exposure Study on the Levels of PCBs, PCDDs and PCDFs in Human Milk, Organohalogen Compounds, 2003"[1], a study was conducted in Bulgaria of the content of persistent and chlororganic pesticides in mothers' milk from 30 healthy women, in groups of 10 from three regions (Bankya – ecologically clean area and two others – Sofia and Blagoevgrad – polluted in varying degrees).

The preliminary results show no presence of endrin, toxaphene and mirex in the mothers' breast milk in the ecologically clean region of Bankya.

The following POPs pesticides were present in breast milk of Bankya region – hexachlorbenzene (0.012 mg/kg lipids), chlordane (0.018 mg/kg lipids), heptachlor (0.013 mg/kg lipids), dieldrin/aldrin (0.004 mg/kg lipids) and e DDT (0.499 mg/kg lipids), presented by pp'-DDE (0.452 mg/kg lipids), opЬ-DDT (0.003 mg/kg lipids) and ppЬ-DDT (0.044 mg/kg lipids). The large predominance of pp' – DDE in samples suggests the general absence of recent DDT sources.

2.3.2.11. Human health impacts

POPs pesticides may enter human body by respiratory, dermal and oral pathway, and they accumulate mainly in breast-milk, blood and fat tissue of human organisms. They are eliminated by mothers' milk and could be dangerous for breast-fed children.

The chronic exposure to POPs pesticides may lead to negative impacts on central and peripheral nervous system, gastro-intestinal tract, the liver (toxic hepatitis with different extent of functional disturbances), skin irritations and allergic reactions. *(Table 26)*.

Representatives of POPs pesticides in contact (respiratory, dermal and oral) with animal living organisms may cause cancer or increase carcinogen sick rate, male and female reproductive functions and hereditary genetic defects.

1 WHO-coordinated Exposure Study on the Levels of PCBs, PCDDs and PCDFs in Human Milk, Submitted to Dioxin 2002. Organohalogen Compounds, 2003.

Table 25 Hazard Classification and health risks of POP pesticides

Pesticides	LD_{50} (mg/kg b.m.) WHO*	Class of Hazard WHO*	Category of carcinogenicity JARC**	Harmful effects to human health
Aldrin	98	I b	3	Immunotoxicity, chronic liver effect, male reproductive system and central nervous system impact
Dieldrin	37	I b	3	Immunotoxicity, chronic liver effect, male reproductive system and central nervous system impact
DDT and metabolites	113	II	2B	Immunotoxicity, interference with estrogenic system, possible endocrine disruption, thyroid, adrenal and retinol effects
Endrin	7	Ib	3	Allergic reactions, toxic hepatitis, central and peripheral nervous system damage
Heptachlor	100	II	2B	Possible endocrine disruption, reproductive disorders
Hexa-chlorobenzene	>10 000	II	2B	Effects on nervous, thyroid, immune, reproductive and endocrine systems, porphyria at humans
Toxaphene	80	II	2B	Central and peripheral nervous system damage, possible endocrine disruption
Chlordane	460	II	2B	Endocrine system impact, reproductive disorders and immunotoxicity
Mirex	306		2B	Teratogen, possible endocrine disruption, immunotoxicity, reproductive and development system impact.

* ***WHO*** *- Hazard Classification of WHO of POP pesticides (Class of Hazard: Ia - extremely hazardous; Ib - highly hazardous; II - moderately hazardous; III – slightly hazardous.)*

IARC - *Classification of agents, mixtures and exposures according to their carcinogenic risk to humans in accordance with the procedures adopted as standard IARC practice: Group 1 - carcinogenic to humans; Group 2A - probably carcinogenic to humans; Group 2B - possibly carcinogenic to humans; Group 3 - not classifiable as to carcinogenicity to humans; Group 4 - probably not carcinogenic to humans.*

No studies of POPs pesticides impact on human health have been carried out in the country.
Conclusion:

No cases of acute and chronic intoxication with persistent chlororganic pesticides.have been registered in the Republic of Bulgaria

Risk assessment by modeling of exposure and effects

Estimation of risk for adults and children in 4 diffrenet scenarios (agricultural, industrial, recreational and urban) was performed in 2001 using Human Exposure to Soil Pollutants (HESP) Model. In the monitoring study 15 districts were included. Soil monitoring data (maximum and average concentrations) were used. The HESP model is directed towards assessment of human exposue to chemicals, which are present in the environment as soil pollutant. The model calculates cumulative and maximum intakes for adults and children living at the contaminated site. The calculated total exposure indicates an annual average. Therefore, the calculated results of daily intake (DI) can be compared with tolerable/acceptable daily intake levels (ADI). In the Netherlands, the tolerable daily intake (TDI) of DDT equals 0.0200 mg/kg.day. The USA EA Reference dose (RfD of DDT) equals 0.0005 mg/kg.day. The Risk Quotient represents the ratio of maximum or average DI/TDI or D/RfD. Its levels: > 1 – large(L); 0.1ч1 – moderate(M); 0.01ч0.1 – small(S); and < 1-negligible(N).

The health risk is negligible in all regions if the risk quotient DI/Netherlands TDI is used for the calculation.

In *Tables 27 and 28* risk indicating data are given ,calculated using the quotient DI/RfD(US EPA). The data are part of the Case Study on persistent organic pesticides implemented in Bulgaria in 2001[1].

1 Kaloyanova-Simeonova F., et all, Human exposure and Risk assessment of soil pollution with Persistent Organochlorine Compounds in Bulgaria, 2001, 7(3-4): 263-275.

Table 26. Risk for children and adults from DDT soil contamination, based on modeling estimation (HESP model)

District	Adult				Children			
	1	2	3	4	1	2	3	4
Montana								
Max.Conc.	S	S	S	-	M	-	S	S
Av. Conc.	S	-	-	-	-	-	-	S
Pleven Max.Conc.	-	-	-	-	S	-	-	-
Vratza Max.Conc.	-	-	-	-	S	-	-	-
Burgas Max.Conc.	-	-	-	-	S	-	S	
Stara Zagora Max.Conc.	-	-	-	-	S	-	-	S
Pazardjik								
Max.Conc.	S	-	S	-	M	-	S	S
Av. Conc.	S	-	-	S	S	-	S	S
Plovdiv								
Max.Conc.	S	-	S	-	M	-	S	S
Av. Conc.	-	-	-	-	S	-	-	S
Haskovo Max.Conc.	S	-	-	-	S	-	S	
Sofia								
Max.Conc.	M	S	S	S	L	-	M	M
Av. Conc.	S	-	-	-	-	-	S	S
Blagoevgrad								
Max.Conc.	-	-	-	-	S	-	-	S
Av. Conc.								
Smoljan								
Max.Conc.	S	S	S	-	S	-	S	S
Av. Conc.	S	-	-	-	S	-	S	S

1 *– Agricultural/Rural;* ***2*** *- Industrial;* ***3*** *-Recreational;* ***4*** *- Urban.* ***Risk: S*** *(small) ;* ***M*** *(medium) ;* ***L*** *(large);*

The average annual concentrations of DDT in all monitored regions represent no risk for the general population .Only maximum concentrations of DDT represent more than small rick for the rural general population in the polluted sites. For children it is considerable in the Sofia rural (1) district and moderate in Montana, Pazardjik and Plovdiv rural districts (1) and Sofia Recreational district (3). For adults moderat risk exists only in Sofia ruaral district (1).

Table 27. Risk for children and adults from Dieldrin soil contamination, based on modeling estimation (HESP model)

District	Adult				Children			
	1	2	3	4	1	2	3	4
Plovdiv	M	-	S	M	-	-	S	M
Veliko Tarnovo	S	-	-	S	M	-	S	M

1 – Agricultural/Rural; 2 - Industrial; 3 -Recreational; 4 - Urban.
Risk: S (small) ; M (medium) ;

The average annual concentrations of Dieldrin in all monitored regions represent no risk for the general population Only maximum concentrations of Dieldrin in Plovdiv and Veliko Tarnovo districts represent more than negligible risk according to HESP calculations. For children moderate risk exist in urban Plovdiv district (4) and rural and urban Veliko Tarnovo district (1,4) . For adults the risk is moderate in rural and urban Plovdiv district (1,4).

Conclusion:

The health risk is negligible in all regions if the risk quotient DI/Netherlands TDI is used for the calculation.

The annual average concentration of DDT and Dieldrin in all monitored districts present no health risk for the general population.

2.3.3. Assessment with respect to Annex A, Part II chemicals - PCBs in equipment

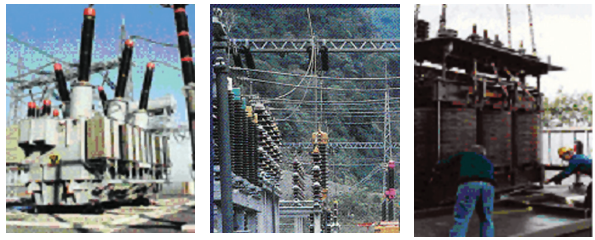
Polychlorinated biphenyls (PCBs) are organochlorine synthetic compounds that belong to the group of industrial persistent organic pollutants, listed in Annex A, Part II of the Stockholm Convention.

2.3.3.1.Production

Manifacture: The main period of manufacture of PCBs occurred from 1930 to the late 1970s in the United States of America; up to 1974 in China; up to the early 1980s in Europe, up to 1993 in Russia; and from 1954 to 1972 in Japan.

The transformers are devices that can increase or decrease the voltage level of an electrical current. For most large transformers, the entire unit is filled with dielectric fluid (often an oil, possibly containing PCBs) to increase the insulation between and to cool the electric coils

Picture 4. Typical transformers, containing PCBs



The quantities of dielectric contained in the transformers is directly dependant on the transformer's capacity, **kVA** The following rule can be applied to estimate this quantity of electricity:

1 kVA = 1 litre of dielectric
1 litre of dielectric = 1.56 kg

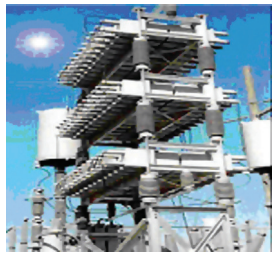
The quantities of dielectric, contained in a transformer depending on the transformer capacity is shown in *table 29*.

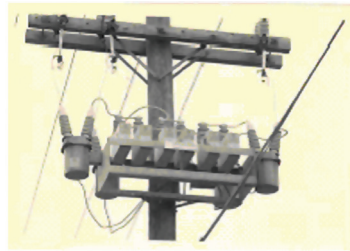
Table 28. Quantities of dielectric

Capacity of transformer, kVA	Quantity,(kg)	Volume, (Density: 1.56)
100	140	90
160	215	138
200	295	189
250	295	189
315	300	192
400	450	288
500	425	272
630	615	394
800	575	369
1 000	670	430
1 250	800	513
1 600	1 130	724
2 000	1 300	833

The Capacitors are devices that store energy in the electric field created between a pair of conductors on which equal but opposite electric charges have been placed. The main structure of a capacitor consists of electrical conducting surfaces(thin metallic foils), separated by a dielectric material, frequently a dielectric fluid that may or may not contain PCBs.

Picture 5. High voltage capacitors and capacitor batteries





Picture 6. Power factor correction capacitors

Power Factor Correction Capacitors are large capacitors that are generally of uniform size (60 cm x 30 cm x 15 cm) and may contain about 1.4 kg of 100% PCB fluid. Power factor correction capacitors are usually located near transformers, often in racks at power stations.

Capacitors containing PCBs

The size of these capacitors varies a great deal, from that of an ice-cube to that of a refrigerator. They can often de identified by the letters „kvar" on their identification plate. These letters show the electrical classification of the capacitor, which usually lies between 5 and 200 kVar.

In practice, all capacitors manufactured between 1930 and 1977 as substitutes for dielectric liquid contain PCBs.

The main countries - producers of PCBs were USA, former USSR, Italy, France, Germany, Spain, Japan, China, former Czechoslovakia, Poland, etc.

Production of these chemicals was banned in 1977, when their ability to accumulate in the environment and to cause harmful effects became apparent. PCBs were gradually withdrawn at the end of 70-ies of past century in Canada, Japan, Sweden and USA and in the beginning of 80-ies – in France,

Germany, Spain and England and in Russia in 1993. So, Equipment manufactured after 1979 usually is considered as not containing PCBs.

Tables 30 and 31 show the various types of transformers and capacitors[1], containing PCBs by manufacturing countries.

1 AMAP Report 2000: 3 „PCB in the Russian Federation: Inventory and Proposals for Priority Remedial Actions"

Table 29. Types of transformers, containing PCB by manufacturing country

Country	Transformer type
USSR	ТНЗ-25/10; ТНЗ-40/10; ТНЗ-630/10; ТНЗ-1000/10; ТНЗ-1600/10; ТНЗ-2500/10; ТНЗП-630/10; ТНЗП-1000/10; ТНЗП-1600/10; ТНЗПУ-1000/10
GDR	DL800Voltawerke, TDLF
West Germany	C; TC
Czechoslovakia	PTK; PTP; PTN;
Poland	TO; TAO; TOC; TON; TOH; TOF; TOW;
France	MiTR; TP

Table 30. Types of capacitors, containing PCB by manufacturing country

Country	Capacitor type	PCB quantity, kg
USSR*	КШС-6.3-50; КС2-1,05-60-У1; КС-2-10.5-75-2У3; КС-2-10,5-50-2У3; КС-2-6,3-75-2У3; КСК-2-10,5-150-2У3; КСК-1-10,5-75-2У3; КС-2-0,38-36-2У3; КС1-0,66-20-1У1; КС1-0,66-20-1У3; КС1-0,66-40-1У1; КСА-0,66-20; КС2-1,05-60-2У1; КС2-0,38-50-У1; КС2-1,05-60-1У1; КС2-0,66-40-2У1; КСК2-10,5-125-1У1; КС2-6,3-75; КСА-0,66-20-У1;КМ; КЭ;	10 ÷ 23
GDR	BK; KCl; KP; LKC; LKCA; LKCl; LKP; LKPA;LKPI; LKPF; LPXF; LPXI; LKPH; LKMI;LKUI; NKPT; NKNI;	
West Germany	D, CO, CD, 4RA, 4RL (produced within the period 1950-1975);	
CSR	DZ	
Poland	C	

**** The USSR condensers** have average PCB content – TCB (a mixture of trichlorobiphenyl isomers) – 16,5 kg. In the cases where the answers represent only data about the number of condensers, the value given was used for expert assessment of the quantity of PCBs in the condensers. Some of the more common trade names under which PCBs were manufactured for transformers, capacitors and other devices are shown in Table 32 and the Synonyms and trade names for PCBs by manufacturing countries in Table 33.*

Table 31. Common trade names under which PCBs were manufactured for transformers, capacitors and other devices

Transformers		Capacitors		Other Devices	
Aroclor	Fenchlor	Aroclor	Elemex	Abestol	Nepolin
Aceclor	Kanechlor	Askarel	Eucarel	Aroclor	No-Flamol
Apirolio	Montar	Clorinol	Hyvol	Askarel	Pyranol
Clophen	Phenoclor	Clorphen	Inerteen	Chlorextol	Pydraul
Chorextol	Pyralene	Capacitor21	MCS 1489	Dykanol	SAF-T-Kuhl
Diaclor	Pydraul	Diaclor	Olex-SF-D	EEC-18	Sorol
Delor	Santotherm	Dykanol	TCB	Inerteen	Therminol
DK	Sovol				Turbinol
Dykanol	Sovtol				
Elemex	SAF-T-Kuhl				

Source: Polychlorinated Biphenyl Inspection Manual, US EPA, 2004

Table 32. Synonyms and trade names for PCBs by manufacturing countries

Manufacturing Country	Some synonyms and trade names of PCBs
USA	Apirorlio, Areclor, Arochlor, Arochlors, Aroclor/Arochlor(s), Arubren, Asbestol, Bakola 131, Biphenyl, Clophen (Germany), Cloresil, Chlophen, Chloretol, Chlorextol, Diaclor, Ducanol, Duconal, Duconol, Dykanol, Electrophenyl, Elemex, Fenocloro, Gilotherm, Hexol, Hivar, Hydelor, Hydol, Hydrol, Hyrol, Hyvol, Inclor, Inerteen, Kenneclor, Leromoll, Magvar, MCS 1489, Montar, Monter, Nepoli, Nepolin, Niren, NoFlamol, No-Flamol, Pyranol, Pyroclor, Pyrochlor, Pyronol, Safe-T-Kuhl, Saft-Kuhl, Saf-T-Kohl, Saf-T-Kuhl
Italy	Abestol, Aceclor, Adkarel, ALC, Apirolio, Diarol, Dicolor, Diconal, Disconon, DK, Dykanol, Educaral ,Elinol, Eucarel, Euracel, Fenchlor, Fenclor
Germany	Ask/Askarel/Askael, Auxol, Bakola, Biclor, Blacol, Chlorphen, Chorextol, Chorinol, Clophen/Clophenharz, Cloresil, Clorinal, Clorphen, Crophene, K(deoachlorodiphenyl), Dyknol, Educarel, EEC-18, Elaol, Hydol,
GDR	CD, Orophene
France	Elenex ,Hywol, Non-Flamol, Olex-sf-d, Orophene, Pheaoclor, Pheneclor, Phenochlor, Phenoclor, Plastivar, Polychlorinated diphenyl, Polychlorinated diphenyls, Polychlorobiphenyl, Polychlorodiphenyl, Prodelec, Pydraul, Pyraclor, Pyralene,
England	Aroclor, Askarel ,Pyroclor, Inclor
Spain	Phenoclor, Pyralene
Czechoslovakia	Decachlorodiphenyl, Delofet O-2, Delor, Delor/Del, Delorene, Delorit, Delotherm DK/DH
Russia/USSR	Hexol ,Santothern, Santovac, Sat-T-America, Siclonyl, Solvol, Sorol, Soval, Sovol, Sovtol
Poland	Chlorfin, Chlorinal/Chlorinol, Chlorinated biphenyl, Chlorinated diphenyl, Chlorobiphenyl, Chlorodiphenyl, Chlorofen, Tarnol, Terphenychlore, Therminal, Therminol, Turbinol
Japan	Electrophenyl, Inertenn, Kanechlor, Kaneclor, Kennechlor, pyralune, Santosol, Santotherm

2.3.3.1.1. Production of Transformers in the Republic of Bulgaria

The manufacturers of transformers in the Republic of Bulgaria are:

- Transformer plant –„Hyundai Elprom Trafo" – Sofia;
- Transformer plant –„Elprom Trafo NS" – Kyustendil;
- Transformer plant – town of Godech

The first oil transformer manufacturer in Bulgaria is „Hyundai Elprom Trafo" – Sofia, established late in the 50s. The transformers manufactured at that time had been filled with imported oils. After the commissioning of the „Plama" facility in the town of Pleven in 1970 година, „Hyundai Elprom Trafo" started production of transformers with Bulgarian oils, manufactured in Plama. Special transformers are manufactured in the „Hyundai Elprom Trafo" facility, mainly for energy, metallurgy, and mining.

In the 80s, part of the manufacturing capacities of „Hyundai Elprom Trafo" – Sofia was moved into „Elprom Trafo NS" facility in the town of Kyustendil, where assemblying of distributing oil transformers with power of up to 1000 kVA was concentrated.

Picture 7. Power Transformers with up to 1000 kVA 1000 kVA.

These transformers are designed for putting into kiosk switchgears from the electrical grid. The main quantities of transformers have been manufactured within the period 1967-1980, and are significantly lower at present. Within the whole period 1950 – 1990 г. in Bulgaria were produced ca 216983 transformers. In 1990, the available number of 52492 transformers, Bulgarian production do not contain PCBs.

- The inventory study showed that none of the three manufacturers produce or have never produced PCBs transformers.

2.3.3.1.2. Manufacturers of Capacitors in Bulgaria

The manufacturers of capacitors in the Republic of Bulgaria are:

- Capacitor plant „Konis" JSC – town of Kyustendil
- Capacitor plant „Amatitza" JSC – village of Kovachevtsi

The first capacitors plant, „Konis" JSC in the town of Kyustendil was commissioned in 1965. This was followed by the establishment of „Amatitsa" JSC in Kovachevtski village, where capacitor batteries are filled with oil in „Konis" JSC in Kyustendil.

- The result of the inventory study is that these companies do not and have never manufactured PCBs containing capacitors.

2.3.3.1.3.Production of Transformer and Capacitor Oils in Bulgaria

The manufacturers of oil (including transformer and condenser oil) are:

- „Plama" JSC – town of Pleven
- „Lubrica" JSC – town of Russe
- „Prista Oil" JSC – town of Russe
- „INSA" JSC – town of Rakovski
- „Lukoil Neftochim" JSC – town of Burgas
- „Verila" JSC – town of Sofia

The result of the inventory study is that these companies do not and have never manufactured PCB oils.

Conclusion:

Polychlorinated biphenyls (PCBs) and PCBs Equipment (transformers and capacitors) have never been manufactured and are not manufactured in the Republic of Bulgaria.

2.3.3.2. Use

Polychlorinated biphenyls (PCBs) are used intensively in the industry since 1930. Theoretically, a total of 209 possible PCB congeners exist, but only about 130 of these are likely to occur in commercial products. Commercial PCBs are a mixture of about 50 congeners.

Their properties (low dielectric constant, chemical and thermal stability, low flammability, low water solubility, high solubility in organic solvents, excellent electrical insulators, low volatility, etc.) made them particularly suitable in multitude of applications such as oil in transformers, dielectrics in capacitors, hydraulic fluids in hydraulic tools and equipment, heat exchange liquids.

They also found wide-spread use as lubricants for turbines and pumps, in the formulation of cutting oils for metal treatment and as ingredients in a range of sealants, adhesives, paints and carbonless copying paper.

Worldwide about 1 million tons of PCBs (60% of total amount) are used as dielectric fluids in electrical equipment such as transformers, capacitors, circuit-breakers, voltage regulators, etc.

The subsections below identify and classify PCBs use area, based on their presence in three types:

- **Closed systems** – a closed PCB application is one in which the PCBs are held completely within the equipment, and no PCB exposure to the environment occur under ordinary circumstances (electric capacitors and transformers).

- **Partially closed systems** – Partially closed PCB applications are those in which the PCB oil is not directly exposed to the environment, but may become so periodically during typical use. These types of use may also lead to PCB emissions, through air or water discharge. Examples of partially closed systems include heat transfer and hydraulic systems, and vacuum pumps.

- **Open systems** – Open PCB applications are those in which PCBs are in direct contact with their surroundings and thereby may be easily transferred to the environment. Plasticizers are the largest group of open applications and are used in PVC, neoprene, and other chlorinated rubbers. In addition, PCBs have been used in a number of other open uses, including paints as flame-retardants, adhesives as plasticizers, and in surface coatings as flame-retardants, inks and insulating materials and pesticides.

In Bulgaria PCBs were used mainly dielectric fluids in electrical equipment such as transformers and capacitors.

1 Proposal for National Implementation Plan for POPs in Czech Republic,TOCOEN Report No.252, January 2004.

2.3.3.3.Import

2.3.3.3.1. Import of Transformer oils, containing PCBs

The transformer oils imported in Bulgaria in the period 1955-1972 amounted to 24120 tonnes, from the USSR, Chechoslovakia, and Hungary as 83% of the transformer oils being imported from the former USSR. The only exporter of Sovtol –10 transformer oil from the USSR is the Orgsintez PO plant in the town of Novomoskovsk, which had exported 39,5 tonnes only for Cuba, Vietnam and Pakistan within 1981 ч1989. The transformer oil imported from Czechoslovakia is 1946 tons, or 8% of the total oil imports. In the period 1962 ч 1984, the only manufacturer- „Chemko – StraЎske" – of PCBs transformer oil of the Delor brand there has not made exports for Bulgaria.[1]

The study results for transformer oil imports showed that:

- Transformer oils imported from the former USSR do not contain PCBs;
- Hungary is not among the manufacturers of PCB transformer oils;
- The transformer oils imported form the former Czechoslovakia do not contain PCBs.

Conclusion:

The imported 24120 t transformer oils in Bulgaria within the period 1955-1972 do not contain PCBs.

2.3.3.3.2. Import of Transformers, containing PCBs

The NIS summarized data about import of transformers and substations for the 1950-1990 period show:

- Till 1970 no transformers have been imported in Bulgaria.
- For the period 1970 г.ч1990 г. in the country 1954 transformers have been imported . Until 1971, all transformers manufactured in Bulgaria were filled with imported oil, mainly from the USSR. Following the start up of production of Bulgarian oils in 1972, the import of oil was stopped and all transformers had been filled with Bulgarian oils, not containing PCBs..
- No information exists about any imports of transformers after 1990.
- Transformers, manufactured after 1988 do not contain PCBs due to ceasing PCBs production on global scale.

The most transformers had been imported from Romania – 951, followed by Korea – 378, the USSR - 313, West Germany and East Germany – 238, Czechoslovakia – 55. Romania and Hungary, Corea, are not manufacturers of PCBs and China had stopped PCBs production in 1974. However, this is no reason for 1248 transformers imported from these countries to be classified as „not containing PCBs" due to the possibility that they may have been filled with imported oils containing PCBs.

Conclusions:

In Bulgaria the maximum assumed number of transformers, containing PCBs could be only those imported 1954 .
Of all transformer import totalling 1954, most likely to contain PCBs are the transformers imported from PCBs manufacturing countries - the USSR, West Germany, East Germany, and Czechoslovakia - total 606 transformers, representing 31% of all imports.

2.3.3.3.3. Import of Capacitors, containing PCBs

No data available about any imports of capacitors with volume larger than 5 dm^3.

2.3.3.4. Export

2.3.3.4.1. Export of Transformers, containing PCBs

The NIS summarized data about export of transformers and substations for the 1950 – 1990 period show:

For the entire period of 1950 – 1990, the exports from among the 216983 manufactured transformers (70136 + 146847) were 144475

- Out of totally produced 70136 transformers for the period 1950 – 1970 from Bulgaria 20079 transformers have been exported.
- Out of totally produced 146847 transformers for the period 1971 – 1990 from Bulgaria 11809 transformers and 66333 power substations with a minimum of 2 transformers each have been exported or in total 144475 transformers.

Conclusion:

For the entire period of 1950 – 1990, the exports from among the 216983 manufactured transformers were 164554 transformers, not containing PCBs.

2.3.3.4.2. Export of Capacitors, containing PCBs

No data available about any exports of capacitors with volume larger than 5 dm^3.

Conclusions:

R Bulgaria is not among the countries – manufacturers of PCBs. The country has never manufactured and does not manufacture PCBs equipment (transformers and capacitors) and oils , containing PCBs.
The country did not export equipment and oils, containing PCBs.
The imported transformers oils do not contain PCBs.
For the period 1970 г.ч1990 г. in the country totally 1954 transformers have been imported . Of all transformer imports, most likely to contain PCBs are the transformers imported from PCBs manufacturing countries – the USSR, West Germany, East Germany, and Czechoslovakia.

2.3.3.5. PCBs in transformers and transformer oils

An inventory of transformers and transformer oils, containing PCBs on the territory of Republic of Bulgaria by 2003 had been carried out based on voluntary submission of data. The 685 letters sent were responded to by 187 companies which represent most of the owners of transformers – power supply companies from the system of the National Electricity Company (NEC); the Bulgarian Railways; Thermal Power Stations; Hydro Power Stations; the chemical industry; metallurgy, etc. in Bulgaria.

The transformers with volume above 5 dm^3 and the transformer oils are divided into four main groups:

- **Group I** – containing > 0,05 % by weight (500 ppm) PCBs;
- **Group II** –containing > 0,005 % by weight(50 ppm)< 0,5 % by weight (500 ppm) PCBs;
- **Group III** – containing PCBs assumed;
- **Group IV** – not containing PCBs.

This grouping is based on a comparison of data received from the owners about the type of transformers; year of production, country-producer and the refernce list of transformer types and transformer oil brands, containing PCBs. 43644 transformers and 45715 tonnes of transformer oil have been inventoried.

Group I: Transformers with volume above 5 dm^3 and transformer oils, containing > 0,05 % by weight (500 ppm) PCBs

The transformers and the transformer oils have been placed in the group with content of PCBs >500 ppm because of the following reasons:

- The transformers are filled with mineral oils manufactured prior to 1988. The main brands transformer oils are: Sovtol-10; TGL; Pyralene; Pyroclor; Clophen; PCB and C, which contain PCBs >500 ppm and had been imported from countries-manufacturers of PCBs.
- Most transformers are of the type ТН3, ТНП3, ТНП, ТН3ПУ and ТНПУ, produced in USSR and TDLF produced in the GDR, classified as containing > 500 ppm PCBs.

Tables 34 and 35 present data about in-use transformers and transformer oils, containing > 500 ppm PCBs and the brand names of the transformer oils, and on *fig.18* – their distribution by districs in Bulgaria for 2003.

Table 34 Transformers and transformer oil containing > 500 ppm PCBs by districts in Bulgaria for 2003

No	Area	Operating Transformers *pcs*	Oils *tonnes*	Used, in storage *tonnes*	Fresh, in storage *tonnes*	Total tonnes
1	Burgas	**4**	4,1			**4,1**
2	Varna	**2**	82,4			**82,4**
3	Veliko Tarnovo	**3**	0,615			**0,615**
4	Vratsa	**45**	4,26			**4,26**
5	Pernik	**13**	23,33	3,85		**27,18**
6	Pleven	**9**	9,01			**9,01**
7	Sofia-city	**64**	107,74	6,03		**113,77**
8	Sofia-district	**6**	13,23			**13,23**
9	Stara Zagora	**4**	1,54			**1,54**
10	Haskovo	**8**	64,32		6,8	**71,12**
Total for Bulgaria		**158**	**310,545**	**9,88**	**6,8**	**327,225**

- The total number of operating transformers,containing > 500 ppm PCBs is 158, located on the territory of 10 districts;
- The total quantity of transformer oils > 500 ppm PCBs in Bulgaria amounts to 327,225 t.

The biggest number of transformers containing > 500 ppm PCBs is present in the large industrial centres: Sofia-city – 40, 51% (64 pcs), Vratsa – 28,48% (45 pcs) and Pernik – 8,23%(13 pcs), This is due mainly to the fact that the located in these regions large enterprises from electric power, chemical and metallurgical industries have been in operation since 30-40 years ago, and they are owners of Soviet and East German transformers, containing > 500 ppm PCBs, being manufactured prior to 1988. The highes % share in transformer oils is observed in the towns of Sofia city - 34,77%; Varna - 25,18% and Haskovo - 21,73%. The disbalance of % distribution by number of transformers and by oil quantities can be noted. Mainly, that is due to the differences in technical parameters of the equipment. For instance, 2 transformers in Varna district contain 82,4 tonnes of transformer oil, containing PCBs. This is so because of the large TEPS in the area which owns large power transformers with a large volume of dielectric.

Table 35 Transformer oil containing > 500 ppm PCBs, by commercial brand and by districts in Bulgaria for 2003

№	District	Operating transformers psc	Commercial brand of oil, t							Total
			Pyroclor	C	TGL	Sovtol-10	Clophen	Pyralene	PCB	
1	Bourgas	4	1,72	2,38						**4,1**
2	Varna	2			82,4					**82,4**
3	V.Tarnovo	3				0,615				**0,615**
4	Vratsa	45			4,26					**4,26**
5	Pernik	13				27,18				**27,18**
6	Pleven	9					9,01			**9,01**
7	St.Zagora	4							1,54	**1,54**
8	Haskovo	8			39,6	31,52				**71,12**
9	Sofia city	64				54,98		56,32	2,47	**113,77**
10	Sofia distr.	6				13,23				**13,23**
	Total	158	1,72	2,38	126,26	127,525	9,01	56,32	4,01	327,225

● The main brands of transformer oils with PCBs > 500 ppm in Bulgaria are: Sovtol-10; TGL; Pyralene; Pyroclor; Clophen; PCB and C. The quantity of PCBs transformer oils brands Sovtol-10; Pyralene; Pyroclor; Clophen; PCB amounts approximately to 198,6 tones equal to 61% of total quantity of PCB oils.

● The largest share belongs to USSR made transformer oil Sovtol-10:39% (127,525 tonnes); followed by the East German oil TGL – 38%,(126,26 tonnes); the French Pyralene – 17% (56,32 tonnes) and the East-German oil Clophen - 3%(9,01 tonnes).

The owners of transformers containing > 500 ppm PCBs are 12 enterprises, mainly from the energy, chemical and metallurgical sectors (*fig.18*).

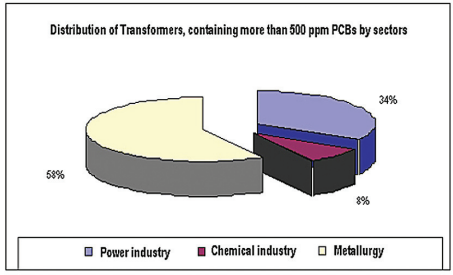


Figure 18Distribution of Transformers, containing > 500 ppm PCBs by sectors in Bulgaria for 2003

- The highest % share by number of transformers is held by 5 companies from the sector of metallurgy – 58%, possessing 92 transformers filled mainly with transformer oil of the brands Sovtol-10, Pyralene and Clophen. Two metallurgical companies have declared 9,88 tonnes of used transformer oil brand Sovtol -10, USSR production.
- In the power sector, there are 6 companies within the National Electricity Company which own 53 transformers, representing 34% of all 158 transformers.
- In the chemical industry sector 3 companies own 13 transformers, representing 8%. The predominant dielectric is oil of the brands Sovtol-10 and Pyroclor.One company has declared 6,8 tonnes of fresh transformer oil Sovtol-10 on stock.
- 11 enterprises have not declared any used or fresh transformer oil, containing > 500 ppm PCBs.
- With 110, 845 tonnes of Sovtol -10 are filled 50 transformers of the type TNZ, TNPZ, TNP and TNPU, manufactured by the USSR, and this amounts to 31,65% of the total number of transformers, and 35,69% of the transformer oils in the in-use transformers containing > 500 ppm PCBs in Bulgaria.

Conclusions:

The total quantity of transformer oils , containing > 500 ppm PCBs in Bulgaria amounts to 327,225 tons, out of which 310,545 in 158 in-use transformers.

Only the total quantity of transformer oils, containing > 500 ppm PCB has been identified, unlike the weight of the equipment due to gaps in the declared data.

The out-of-use waste transformer oils, containing > 500 ppm PCBs are 9,88 tonnes.

The fresh transformer oils on stock, containing > 500 ppm PCBs amount to 6,8 tonnes

<u>Group II:</u> Transformers with volume above 5 dm³ and Transformer oils, containing > 0,005 % by weight (50 ppm)< 0,05 % by weight (500 ppm) PCBs

The transformers and the transformer oils have been placed in the group with content of PCBs >50 ppm because of the following reasons:

- The transformers are filled with mineral oils manufactured prior to 1988 and with unknown PCB concentrations;
- No data are available about the transformers' power (KVA), being the main criterion in determining the concentration of PCBs in them;
- No information about the transformer production dates and equipment-weight is available;
- Most transformers are of the TDLF type, produced in the GDR, classified as containing PCBs;
- No information about the dielectric manufacturer and oils production dates is available;
- All transformer oils are produced in the GDR – a country manufacturing PCBs.

Table 36 shows data about in-use transformers and transformer oils, containing >50 ppm PCBs, by districts.

Table 36 Transformers and transformer oils with PCB content > 50 ppm by districts in Bulgaria for 2003

№	District	Transformers, *Pcs.*	Oils, tons
1.	Blagoevgrad	2	66
2.	Burgas	6	243,1
3.	Varna	5	147,1
4.	Veliko Tarnovo	5	211,8
5.	Vratsa	4	208
6.	Pleven	1	33
7.	Plovdiv	2	138
8.	Sofia-city	2	40,5
9.	Sofia-district	10	453
10.	Stara Zagora	4	101,6
	Total for Bulgaria	**41**	**1642,1**

- On the territory of Bulgaria there are totally 41 transformers, containing > 50 ppm PCBs and 1642,1 t transformer oils, located in 10 districts;
- The owners of these transformers are 2 companies from energy sector. The first company is a holding structure within the system of the National power supply net with 23 branches in 10 districts of Bulgaria, differentiated as independent enterprises. This company owns 37 transformers (90%) with 1434.1 tonnes (87%) of dielectric.The other company is the Nuclear Power Plant „ NPS Kozlodui" SA, owner of 4 transformers (10%) with 208 t (13%) of dielectric;
- The largest number of equipment is located in Sofia district (10 pcs), followed by Burgas (6 pcs), Varna and V.Tarnovo districts (5 pcs each). In regard with transformer oils, the leader is again Sofia district (453 t), followed by Burgas (243,1 t), V.Tarnovo (211,8 t) and Varna (147,1 t). An impression was made that the two transformers located in Plovdiv district are filled with 138 t dielectric, containing > 50 ppm PCBs .

Table 37 shows the distribution of in-use transformers in energy sector and transformer oils, containing > 50 ppm PCBs by number of enterprises and districts in Bulgaria for 2003.

Table 37 Transformers and transformer oils, containing > 50 ppm PCBs in energy sector by number of enterprises and districts in Bulgaria for 2003

№	District	Number of enterprises	Transformers Type	Transformer Producer	oils *Pcs*	Type	*Tons*
1	Blagoevgrad	1	ДКДГ-А1	GDR	**2**	GB Nytrafo 11	**66**
2	Burgas	5	KDRF 30000	GDR	**2**	TRF-GL	**168**
			TDLF-25000	GDR	**1**	TRF-G	**18**
			TDLF-25000	GDR	**1**	TRF-GL	**18**
			TDLF-25000	GDR	**1**	TRF-GL	**18**
			TDLF-40000	GDR	**1**	TRF-GL	**21,1**
3	Varna	4	TDLF40000	GDR	**1**	TRF-G	**21,1**
			TDLF25000	GDR	**1**	TRF-GL	**18**
			KDRF/v300001	GDR	**1**	TRF-GL	**69**
			TDLF40000	GDR	**2**	TRF-G	**39**
4	Veliko Tarnovo	3	DKDF-A1	GDR	**1**	TRF-G	**31,8**
			TDLF-40000	GDR	**2**	TRF-G	**42**
			KDRF-300001	GDR	**2**	TRF-GL	**138**
5	Pleven	1	DKDF-A1	GDR	**1**	TRF-G	**33**
6	Plovdiv	1	KDRF300001	GDR	**2**	TRF-GL	**138**
7	Sofia-city	2	TDLF31500	GDR	**1**	TRF-G	**22,5**
			TDLF25000	GDR	**1**	TRF-G	**18**
8	Sofia-district	4	TDLF25000	GDR	**1**	TRF-G	**18**
			DKDF-A1	GDR	**5**	TRF-G	**159**
			KDRF300001	GDR	**2**	TRF-GL	**138**
			KDRF300001	GDR	**2**	TRF-GL	**138**
9	Stara Zagora	2	TDLF25000	GDR	**2**	TRF-G	**56,6**
			TDLF50000	GDR	**2**	TRF-G	**45**
10	Vratsa	1	KWE160001	GDR	**4**	Nitro10TX	**208**
	Total	**24**			**41**		**1642,1**

The identified 41 transformers, containing 1642,1 tonnes of oils are manufactured by the former GDR .Based on the transformer type TDLF, they are classified as equipment, containing > 50 ppm PCBs.

Conclusion:

The owners of transformers containing PCBs >50 ppm are 2 companies from the Energy sector. Only the total quantity of transformer oils in Bulgaria, containing PCBs >50 ppm has been identified as 1642.1 t in 41 in-use transformers but not their weight because of gaps in the declared data.

Group III: Transformers and transformer oils with PCBs assumed

The transformers and the transformer oils have been placed in this group according to the generally accepted rules for classification of transformers with assumed PCBs content, according to the Basel Convention:

- Transformers filled with mineral oils manufactured prior to 1988 and with unknown PCBs concentrations;
- Unknown date of production of the transformers;
- Unknown date of production and type of the dielectric.

Table 38 shows data about in-use transformers and transformer oil with PCBs assumed by districts.

Table 38. Transformers and transformer oils with PCBs assumed content in Bulgaria by districts for 2003

№	District	Enterprises *number*	Transformers *pcs*	Oils *tons*	Oils on stock Waste *tones*	Oils on stock Fresh *tons*	Oils Total *tons*
1	Burgas	3	44	10,81			10,81
2	Varna	2	3	84			84
3	V. Tarnovo	4	884	508,8	4,72	1,2	514,72
4	Vratsa	3	59	272,96	2,62	20,44	296,02
5	Gabrovo	2	1100	567,1			567,1
6	Kardzhali	1	8	76,86			76,86
7	Kyustendil	2	13	219,05			219,05
8	Lovech	2	10	7,53			7,53
9	Pleven	1	9	0,18			0,18
10	Plovdiv	2	22	164,81			164,81
11	Razgrad	2	21	6,5			6,5
12	Russe	1	1	28,1			28,1
13	Silistra	2	804	232,1			232,1
14	Sliven	1	1				0
15	Sofia-district	1	5	0,74			0,74
16	Stara Zagora	4	94	295,04	2,9	15,2	313,14
17	Targovishte	1	3	9			9
18	Yambol	1	1				0
Total for Bulgaria		35	3082	2483,58	10,24	36,84	2530,66

- Owners of transformers and transformer oils with PCBs assumed are 35 companies from the energy sector: Nuclear power station, thermal power stations, Hydro power stations, Power supply companies and to a less extent, chemical, machine building, metallurgy and light industries.
- 3082 in-use transformers with PCBs assumed, containing 2483,58 t transformer oils have been identified in 18 administrative areas in Bulgaria. Most of these transformers are imported mainly from USSR, GDR, Poland, Czeck Republic and had been manufactured prior to 1988. The type, power and weight are not known about a large portion of the transformers. The composition of most transformer oils is unknown.
- The largest number of transformers with PCBs assumed is located in 3 of the districts (2788 pcs), comprising 89% of all transformers in this group: respectively in Gabrovo – 35%; Veliko Tarnovo – 28%, and Silistra – 26%. This is due to the fact that the Power supply companies in those district had not presented data for the transformer types and transformer oils brands.
- There are 10,24 t of out-of-use waste transformer oils with PCB assumed .
- The fresh transformer oils on stock, with PCBs assumed are 36,84 t.

Conclusion:

These transformers are owned by 35 companies, mainly from the Energy sector. and to a less extent, chemical, machine building, metallurgy and light industries.

A total of 3082 transformers with PCBs assumed and 2531 tonnes of transformer oil have been identified in 18 administrative areas in Bulgaria.

Fresh transformer oils with PCBs assumed on stock are 36,84 t.

Waste transformer oils with PCBs assumed on stock are 10,24 t.

Only the total quantity of transformer oils with PCB assumed has been identified, – but not the weight of the equipment, due to insufficient data for the type, producer, power and weight of transformers and for the transformer oils brands.

2.3.3.6. PCBs in capacitors and capacitor oils

An Inventory of capcsitors and capacitor oils, containing PCBs on the territory of Republic of Bulgaria by 2003 had been carried out based on voluntary submission of data. Letters-questionaries were sent to the same companies-owners of transformers. The 685 letters sent were responded to by 187 companies owners of capacitors.

The capasitors and capacitor oils are divided into three main groups:

- **Group I** – containing PCBs;
- **Group II** – containing PCBs assumed;
- **Group III** – not containing PCBs.

This grouping is based on a comparison of data received from the owners about the type of capacitors and capccitor oil; year of production, country-producer and the list of capacitor's types and capacitor's oil brands, containing PCBs.

A total number of 17689 capacitors and a quantity of 26 tonnes totally of capacitor oils have been inventoried.

Group I – Capacitors and capacitor oils, containing PCBs

The capacitors and the capacitor oils have been placed in the group with containing PCBs because of the following reasons :

The capacitors are filled with mineral oils manufactured prior to 1988. The main brands capacitor oils are: Orophen, Isokond and CD, which contain PCBs and had been imported from countries-manufacturers of PCBs.

Most transformers are of the type КС, КСК and КМ, produced in USSR and LK, LKCI, LKCL, LPXE and LPXF, produced in the GDR, classified as containing PCBs.

Table 39 shows data about the total number of capacitors and the quantity of capacitor oils, containing PCBs by districts in Bulgaria for 2003.

Table 39 Capacitors and capacitor oils, containing PCBs by districts in Bulgaria for 2003.

№ District	Enterprise	Capacitors	Oils	Capacitors on stock spare	Out-of-use	Capacitors TOTAL
	pcs.	*pcs.*	*kg*	*pcs.*	*pcs.*	*pcs.*
1 Burgas	**3**	15	**721,5**			**15**
2 Veliko Tarnovo	**1**	100			50	**150**
3 Lovech	**1**	319			21	**340**
4 Pazardzhik	**1**		**348**		87	**87**
5 Plovdiv	**3**	576	**1694**	18		**594**
6 Russe	**1**	8				**8**
7 Sofia-city	**2**	485	**4560**		456	**941**
8 Stara Zagora	**1**	180				**180**
9 Haskovo	**2**	86	**575**	14		**100**
Total for Bulgaria	**15**	**1769**	**7898,5**	**32**	**614**	**2415**

- The owners of PCBs capacitors are 15 enterprises, mainly from the chemical and mining industries, machine building and metallurgy. Many companies have not declared the quantities of oil in the capacitors, and for other - no data is available about the type and number of other capacitors.
- In total, 2415 capacitors containing PCBs, or 13% of all capacitors in Bulgaria have been identified, located on the territory of 9 administrative areas.
- There are 1769 in-use capacitors containing PCBs, or 73% of all capacitors containing PCBs, as 59% of which are located in Sofia city and Plovdiv. The in-use PCB capacitors have been imported from the former Eastern Germany and USSR, the % ratio being: GDR – 68% and the USSR – 32%. The Soviet capacitors have average PCBs content of 16,5 kg.
- There are 32 spare PCBs capacitors on stock.
- There are 614 out-of-use PCBs capacitors.
- The capacitors oils containing PCBs, currently in the equipment are 7,899 tons.
- As per an expert assessment the actual quantity of capacitors oils containing PCBs, probably is approx. 40 tonnes, i.e. 5 times more than the declared 7,9 tonnes.

Again the lack of data about the number of capacitors or about oil quantities makes the distribution by % inaccurate, but it can be noted, however, that machine building industry holds the highest % share by number of capacitors and by oil quantities.(*Fig. 19 & 20*).

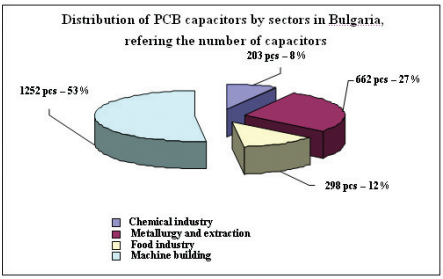


Figure 19 Distribution of PCB capacitors in Bulgaria by sectors for 2003, referring the number of capacitors

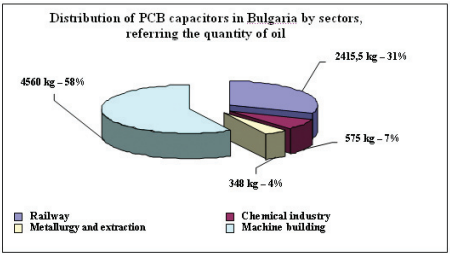


Figure 20 Distribution of PCB capacitors by sectors in Bulgaria, referring the oil quantity in kg for 2003

Conclusions

- The owners of PCBs capacitors are 15 enterprises, mainly from the chemical and mining industries, machine building and metallurgy.
- The Machine building sector holds the highest share by number of PCB condensers (53%), and by oil quantity (58%).
- The total number of PCBs capacitors is 2415, out of which in use are 1769 pcs., containing 7,899 tonnes of capacitor oils.
- There are 32 spare PCBs capacitors on stock.
- There are 614 out-of-use PCBs capacitors on stock
- Many companies have not declared the quantities of oils in their capacitors , and others - no data is available about the type and number of the capacitors. As per an expert assessment the actual quantity of capacitors oils containing PCBs, probably is approx. 40 tonnes, i.e. 5 times more than the declared 7,9 tonnes.

Group II – Capacitors and capacitors oils with PCBs assumed

Capacitors and capacitors oils are grouped according to the generally accepted rules for classification of PCBs assumed according to the Basel Convention:

- Capacitors manufactured prior to 1985 and of unknown PCBs concentration;
- Unknown production date or type of the Capacitors
- Unknown date of production and type of the dielectric;

Table 40 shows data about the total number of capacitors and the quantity of capacitor oils, containing PCBs assumed by districts in Bulgaria for 2003.

Table 40 Capacitors and capacitors oils with PCBs assumed by districts in Bulgaria for 2003.

№	District	Enterprise	Capacitors	Oils	Capacitors on stock		Capacitors TOTAL
					spare	Out-of-use	
		pcs.	*pcs.*	*kg*	*pcs.*	*pcs.*	*pcs.*
1	V.Tarnovo	**1**	54				54
2	Vratsa	**2**	61	1650			61
3	Lovech	**1**				9	9
4	Montana	**1**	24				24
5	Pazardjik	**1**	36				36
6	Pleven	**1**	14				14
7	Plovdiv	**3**	587	1100	151		738
8	Razgrad	**1**	60	400			60
9	Russe	**1**	5				5
10	Smoljan	**1**	114	26,22			114
11	Sofia city	**5**	50	88	17	46	113
12	Sofia district	**5**	83		53	48	184
13	StaraZagora	**2**	1053		24	30	1107
14	Haskovo	**1**	18			97	115
Total for Bulgaria		**26**	**2159**	**3264,22**	**245**	**230**	**2634**

- The owners of PCBs assumed capacitors are 26 enterprises from the following sectors – power industry, chemical and mining industries, machine buildingq metallurgy and food industry;
- 2634 PCB assumed capacitors have been identified in Bulgaria representing 15% of the total number of capacitors in the country, located in 14 districts;
- The PCB assumed capacitors currently in use are 2159 or 81% of all PCB assumed condensers, as 75% of them are located in the areas of Stara Zagora and Plovdiv ;
- There are 245 spare capacitors with PCBs assumed on stock.
- There are 230 phased - out capacitors with PCBs assumed on stock.
- The PCBs assumed capacitorr oils currently in the equipment are 3,264 tons.

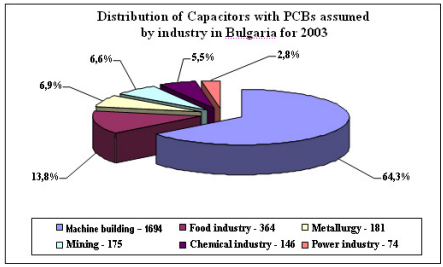


Figure 21 Distribution of Capacitors with PCBs assumed by industry in Bulgaria for 2003

- The Machine building sector holds the highest share by total number of PCBs assumed capacitors (64,3%), followed by food industry – 13,8%. The rest sectors are with almost equal share ranging 3 % ч 7% (*fig.21*).
- The PCBs assumed capacitors are imported mainly from the USSR, GDR and Italy.
- Information about the type and manufacturer of the capacitors exists only for 966 out of 2634 PCBs assumed capacitors. No information about the manufacturing country, the type of capacitors or the brand of the oil is available for 1668 capacitors.

Conclusions:

- The owners of PCBs assumed capacitors are 26 enterprises from the following sectors – power industry, chemical and mining industries, machine buildingq metallurgy and food industry;
- 2634 PCB assumed capacitors have been identified in Bulgaria representing 15% of the total number of capacitors in the country, located in 14 districts;
- The PCB assumed capacitors currently in use are 2159 containing 3,264 t oils.
- Machine building sector holds the highest share by total number of PCBs assumed capacitors - 64,3%.
- PCBs assumed capacitors are imported mainly from the USSR, GDR and Italy.
- Information about the type and manufacturer of the capacitors exists only for 966 out of 2634 PCBs assumed capacitors.
- No information about the manufacturing country, the type of capacitors or the brand of the oil is available for 1668 capacitors.

2.3.3.7. Existing policy and regulatory framework

Bulgarian legislation for Chemicals Management with relevance to PCBs (Annex D, Part II of Stockholm Convntion) includes:

Law on Protection against Harmful Impact of Chemical Substances and Preparations (LPHICSP), promulgated in SG 10/2000, amended and supplemented SG 114/2003.

- Regulation relating to bans and restrictions on the marketing and use of Dangerous Chemical Substances and Preparations, promulgated in SG 62/2004;
- Regulation on Import and Export of Dangerous Chemical Substances and Preparations on

the territory of the Republic of Bulgaria, promulgated in SG 63/2004;

- Regulation on the requirements for the order and the manner of inventory, labeling and decontamination of equipment, containing PCBs as well as the treatment and transportation of waste, containing PCBs, adopted by MC Decree No 50/09.03.2006, promulgated in SG 24/21.03.2006.

2.3.3.8. Environmental Monitoring Levels

Polychlorinated biphenyls (PCBs) are synthetic organic chemicals comprising 209 individual chlorinated biphenyl compounds (known as congeners). Exposure to each of these compounds is associated with different levels of risk for harmful effects. There are no known natural sources of PCBs. Although PCBs are no longer manufactured, people can still be exposed to them. The two main sources of exposure to PCBs are the environment and the workplace. Because of resistance to degradation, PCBs persist in the environment for decades.

Once released into the environment, PCBs adsorb strongly to soil and sediment. As a result, these compounds tend to persist in the environment with half-lives for most congeners ranging from months to years. Leaching of PCBs from soil is slow, particularly for the more highly chlorinated congeners, and translocation to plants via soil is insignificant. Cycling of PCBs through the environment involves volatilization from land and water surfaces into the atmosphere.

In Bulgaria the existing data on soil, surface and ground water monitoring for PCBs contamination reffer to pollution caused by unintentional release of PCBs emissions (see item 2.3.4. POPs releases).

- No studies has been made in Bulgaria, investigating the PCBs levels in air over industrial sites, where PCBs equipment is located.
- No studies has been made for the soil contamination cause by PCBs equipment.
- No studies has been made for the surface water contamination cause by PCBs equipment.

2.3.3.9. Human exposure and PCBs health impacts

General population exposure[1]

PCBs are present in the environment all over the world, due to their high persistence and lipophilic properties. However, the exposure of the general population via air is very low. Exposure of the general population to PCBs is principally through food chain. The primary route of humans exposure to PCBs appears to involve the consumption of contaminated foods, particularly meat, fish, and poultry. Babies could be indirectly exposed by moyhers' milk.

Occupational exposure

Occupational exposure occurs during PCB use by electrical or other industries. It might also be widespread among mechanics in contact with lubricating oils and hydraulic fluids, among workers who have contact with varnishes and paints. Furthermore, exposures have occurred through accidents and occupational exposure – for example during the repair of transformers and capacitors, PCBs equipment accidents as leakages and spills, or during handling of toxic wastes.

1 Polychlorinated Byphenils and Terphenyls (2nd edition), IPCS,WHO,Geneva, 1993,pp 26-29.

- Due to recent preliminary PCBs Equipment Inventory, in Bulgaria no studies has been made for occupational exposure cause by PCBs equipment leaks or among mechanics being in long-term contact with lubricating oils and hydraulic fluids, containing PCBs

Accidental exposure

Accute emergency events may cause extremely high concentrations of PCBs in air, particularly in cases when PCBs are burnt or heated (fire,short circuit with electric arching, burning in welding, etc.) In case of extensive leaks of unheated PCBs from capacitors much higher concentrations could be found in workroom air. Very high concentrations of these toxic chemicals may be found in soot emitted in connection with fires and explosions of PCBs transformers and capacitors.

When evaluating PCB accidental exposure, it is important to take into account skin absorption from surfaces and tool, in addition to exposure via inhalation. Thus, skin contamination, and the ingestion and inhalation of soot particles, may result in serious exposure in PCBs accidents and emergencies.

- No accidents with PCBs equipment had been reported by PCB equipment owners in Bulgaria.

Effect to Human health

PCBs usually occur as mixtures of many congeners, and many of the data on the toxicity of PCBs are based on the testing of these mixtures.

There are great difficulties in assessing human health effects separately for PCBs, since , quite frequently, dioxins (PCDDs) have been present in the PCB mixtures to which humans have been exposed.The presence of PCDDs has occasionally been seen in accidents with certain PCB/chlorobenzene mixtures. Commercial PCBs have been shown to be contaminated with PCDDs and, therefore, in many cases it is unclear whether effects were attributable to the PCBs themselves or to much more toxic PCDDs.

PCBs effects on human health include: liver and thyroid gland damage, skin and eye changes, immunitoxicity, neurobehavioural deviations, reduced body mass of the newly born, reprotoxicity and carcinogenity. PCBs can damage the ductless glands. JARC classified PCBs in 2A group as probably carcinogenic for humens They have also been classified as endocrine disruptors in an intact organism.

No purposeful studies on target groups workers or risk groups of population for PCBs exposure assessment by biological monitoringq investigation of negative health impacts on target organs and systems, including also the long-term effects of PCBs on liver, endocrine balance, immune system, reproduction and additional cancer risk have been carried out in Bulgaria.

Conclusions:

- No cases of acute and chronic intoxication with polychlorinated byphenyls (PCBs) in equipment have been registered in the Republic of Bulgaria .
- No studies of PCBs effects on human health caused by PCBs equipment leaks or spills have been carried out in the country.

2.3.4. ASSESSMENT WITH RESPECT TO ANNEX B CHEMICALS - DDT

Bulgaria has never manufactured and does not manufacture DDT. It had been used in the 50-s of past century in various preparations (technical product content in the range of 5 ч 20%, most usually 5,5%). Later DDT was widely applied in agriculture to control various pests on cotton and other crops as insecticide. It was used also against mosquitoes. The use of DDT was restricted in the 60-s and completely banned for import and use in agriculture in 1969.

Detailed assessment of import, export, use and levels of DDT in environment are shown in item

2.3.4.1. Assessment with respect to POPs pesticides.

- Bulgaria has never manufactured and does not manufacture DDT.
- DDT was completely banned for import and use in agriculture in 1969.

2.3.5. Assessment of releases from unintentional production of Annex C chemicals (PCDD/PCDF, HCB and PCBs)

Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs) are unintentionally formed from anthropogenic sources and released from thermal processes involving organic matter and chlorine as a result of incomplete combustion or chemical reactions.

2.3.5.1. Assessment of sources of POPs emissions into the atmosphere

The categories of industrial sources with potential for comparatively high formation and release of dioxins/furans(PCDD/PCDF), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCBs) to the environment could be seen from *fig.22*.

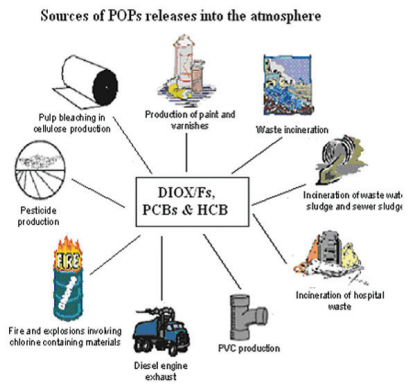


Figure 22 Source categories POPs releases into atmpsphere from unintentional production

2.3.5.2. Distribution of POPs source categories in Bulgaria

Table 41 Number of facilities by source categories of unintentional POPs releases

source categories	number of facilities
Incinerators	
- Municipal solid waste;	-
- Hazardous waste;	25
- Medical waste;	52
Cement kilns	3
Metallurgy	
- Thermal processes in metallurgy;	16
- Secondary copper production;	-
- Sinter plants in the iron and steel industry;	5
Industrial combustion processes	427
Combustion processes in energy generation and transformation	34
Combustion processes in trading, administrative and household sectors	644
Firing installations for wood	1
Waste oil refineries	2

2.3.5.3. POPs releases from unintentional production in Bulgaria

The emissions are calculated in relation with National CORINAIR - 94 methodology, approved by the Minister of Environment and Waters, adapting the emission inventory Guide - CORINAIR-94, SNAP-94 for the Bulgarian conditions, taking into account the national specificities concerning the respective activity, technologies and equipment.

This methodology is used for inventorying and for balance determination of the emissions of harmful substances into the air, deviding the pollutants into three groups. POPs belong to the third group – persistent organic pollutants.

2.3.5.3.1. National annual POPs emissions - Dioxins/Furans, PCBs and HCB

The national annual POPs emissions from unintentional production – dioxins and furans, polychlorinated biphenyls and hexachlorbenzene – in the atmosphere for the period 1990 – 2003 are summarized in *Table 42 and figures 23 & 24*.

Table 42 National annual emissions of POPs releases in the atmosphere for the period 1990-2003

Year	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003
PCDDs/Fs, g I-TEQ/y	554,2	456	340,9	309,7	288,3	245,2	232,5	200,9	218,5	255
PCB, kg/y	258,5	382,3	261,7	226,9	252,8	234,3	228,5	211,9	250,1	260,7
HCB, kg/y	544	79	87	47	76	46	54	42,5	38	45

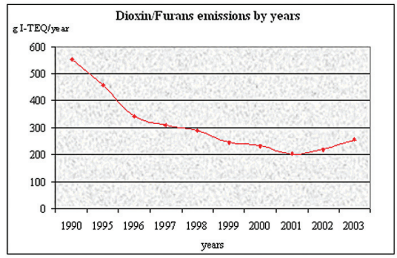


Figure 23 Annual PCDDs/PCDFs releases in the atmosphere by years

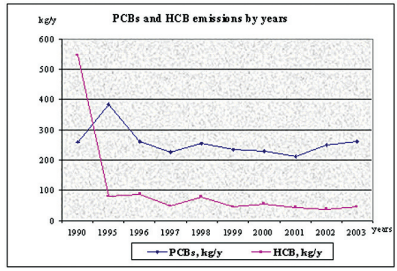


Figure 24Annual PCBs and HCB releases in the atmosphere by years

An increase of Ds/Fs releases has been observed in 2003 by 16,7% of the 2002 emissions.In comparison to base year 1990, the annual emissions of dioxin/furans for 2003 a downward trend of 53,9% or 2,2 times had been observed, following the European trend. According to official data for PCDDs/PCDF emissions in Europe within the period 1990 ч 2003,the decrease is 2,7 times (63%)[1].

The annual PCBs emissions for the period 1990-2003 are almost the same.

For the period 1990-2003, the HCB emissions in the atmosphere show a signicicant downward trend. Compared to the base year 1990, for the HCB emission in 2003, a sharp decrease with 91,7% or 12,1 times has been registered due to the decline of industrial production.

2.3.5.3.2. National annual sector POPs emissions by category sources

The Bulgarian national annual sector POPs emissions – dioxins/furans, PCBs and HCB by category sources in air for the period 2000-2003 are presented in *Tables 43*.

1 Shatalov V.at al., Modelling of POP contamination in European region: Evaluation of the model performance. EMEP/MSC-E Technical Report 7/2005, August 2005, pp 103-117.

Table 43 Annual POPs releases in ambient air by emission categories for year 2000 ч 2003 in Bulgaria

Emission categories	PCDDs/PCDFs, g I-TEQ/y				PCBs , kg/y				HCB, kg/y			
	2000	2001	2002	2003	2000	2001	2002	2003	2000	2001	2002	2003
1. Combustion processes in energy generation and transformation;	109,1974	102.049	105.4	122,6	40,6394	37,799	39,341	46,142				
2. Combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing;	58,3389	44.920	59.4	70,9	141,373	124,719	156,7	164,61				
3. Industrial combustion processes;	16,3823	8.325	7,5	9,7	5,151	1,9849	1,755	2,261				
4. Industrial processes;	21,5054	20.464	19,1	23,5					19	18,5	16	21
5. Production and distribution of fossil fuels;												
6. Use of solvents;												
7. Road transport;	7,226	6.241	9,2	10,5	41,236	35,85	41,27	37,055				
8. Other motor vehicles and machines;	9,685	11.494	10,9	10,5	0,076	11,47	10,95	10,514				
9. Waste treatment and disposal;	10,193	7.362	6.978	7,283		0,059	0,056	0,137	35	24	22	24
10. Agriculture and forestry, and changes in land-use												
11. Nature												
Total annual POPs emissions	**232,528**	**200.855**	**218.592**	**254,983**	**228,475**	**211,882**	**250,127**	**260,71**	**54**	**42,5**	**38**	**45**

Power sector is the main source of **dioxins/furans and PCBs** emissions into the atmosphere. The increase of dioxins/furans releases with 17,2 g (16%) for 2003 versus 2002 is due to the growing up consumption of lignite coal. For instance, the emission factor of Ds/Fs for black(anthracite) coal is 1.6 mg/t, while for lignite coal - 4.37 mg /t. PCBs emissions from combustion processes in energy generation and transformation also has increased with 6,8 kg (17,4%) versus previous year.

In 2003 the largest source of dioxins and furans are the thermal electric power stations (TEPS) with 48,1 % share of the entire releases emitted in Bulgaria from antropogenic activity, followed by fuel combustion in the household sector – 27,8 %.

Concerning **PCBs** , the largest % share is covered by PCBs emissions from combustion processes in trading, administrative and household sectors – 63,1%, followed by releases from road transport and other motor vehicles and machines - totalling to 18,2% and combustion processes in energy generation and transformation – 17,7%.

The increased consumption of coal and wood in the household sector has resulted in a growth of PCDD/F and PCB emissions.In 2003 the household sector emitted 11,2 g more PCDD/PCDF and 7,9 kg more PCB in air as compared to the previous year.

The main sources of **HCB** emissions in 2003 are the categories „waste treatment and disposal" and „industrial processes" with lasting downward trend as a decrease with 16,6% versus 2000 was registered. The HCB emissions for the period 2000 – 2003 are within the range 38 ч 54 kg/year, being for 2003 – 45 kg.

Figures 25 and 26 show the % share of the main category sources, emitting PCDDs/PCDFs in air and PCBs for 2003.

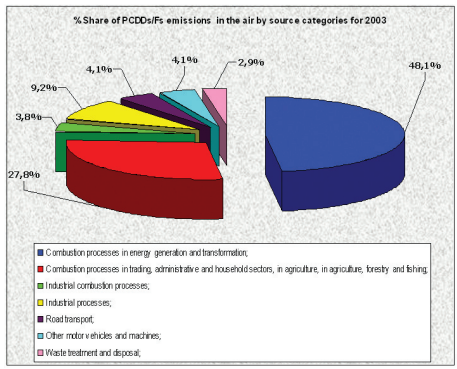


Figure 25 % Share of the PCDDs/Fs releases by source categories for 2003.

The main sources of of **PCDDs/Fs** emissions are the large industrial centres, where the big thermal electric power stations amd industrial manufacturers are located and the main road and railway routes pass by.

The assessment of data in 2003 show, that 75,9% of PCDDs/Fs releases are formed by categories „combustion processes in energy generation and transformation" (48,1%) and „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing"(27,8%), followed by „industrial processes"(9,2%) and „road transport"(8,2%).

The PCDDs/Fs emissions from industrial processes in 2003 had increased with 18% versus 2002, probably due to slow restructuring of industry sector and the lack of enough financing. Road transport marked 4,3% growth of Ds/Fs annual emissions versus previous year, due to an increase of second hand cars import, old automobile park and te slow rate of its renovation.

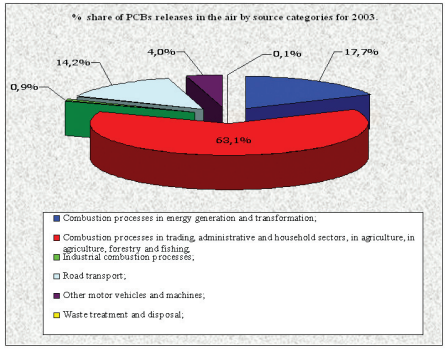


Figure 26 Share of PCBs releases in the air by source categories for 2003.

The biggest source of PCBs emissions in 2003 are the combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing, representing 63,1% of total PCBs annual sector releases, followed by road transport and other motor vehicles and machines – 18,2% and the combustion processes in energy generation and transformation – 17,7%.

Conclusions:

- **POPs releases**, generated in Bulgaria in the past 5 years are within the range as follows:

  - **Dioxins/Furans:** 200 ч 255 g I-TEQ/y, and in 2003 have reached 254,9 g I-TEQ/y.
  - **PCBs**: 212 ч 261 kg/y, and for 2003 have reached 260,7 kg.
  - **HCB:** 38 ч 54 kg/y, and for 2003 being 45 kg.

- **For the period 1990-2003 the POPs emissions in the atmosphere show lasting downward trend.**Compared to the base year 1990, PCDDs/PCDFs and HCB note a sharp decline, respectively with 53,9% or 2,2 times and with 91,7% or 12,1 times. The annual PCBs emissions for the same period are almost the same, which could be explained with upward or downward change of the PCBs emissions formed by various category sources.
- The registered **decline in PCDDs/Fs emissions** into the atmosphere for 2003 compared to base year 1990 is due mainly to the categories „waste treatment and disposal" – 95%, „combustion processes in industry" – 88%; „industrial processes" - 46% and „road transport and other motor vehicles and machines" – 43%. The lowest decline show category sources „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing" – 25% and „combustion processes in energy generation and transformation" – 23%.

● The assessment of data show, that 75,9% of PCDDs/Fs releases are formed by categories „combustion processes in energy generation and transformation" (48,1%) and „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing"(27,8%), followed by „industrial processes" and „road transport".

● The registered **decline in PCBs emissions** into the atmosphere for 2003 compared to base year 1990 is due mainly to the categories„road transport and other motor vehicles and machines" – 54% and „combustion processes in energy generation and transformation"- 18%. PCBs emissions from categories „combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing" have increased considerably with 88,8%, which could be explained mainly with the growth in the consumption of wood and coal in household sector during past 5 years.

● The main sources of **HCB emissions** in air for 2003 are the categories „waste treatment and disposal" and „industrial processes" with lasting downward trend. Compared to base year 1990 a sharp decline of HCB emissions with 91% or 11 times is registered for the category „waste treatment and disposal" .

● The combustion processes are **the main source of PCDDs/Fs and PCBs** emissions for 2003.

- Thermal electric power stations emit about 48,1% of total annual **dioxinx/furans** emissions, followed by combustion processes in household sector – 27,8%, combustion processes in industry – 13% and road transport and other motor vehicles and machines – 8,2%.

- The biggest source of PCBs emissions in 2003 are the combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing, representing 63,1% of total PCBs annual sector releases, followed by road transport and other motor vehicles and machines – 18,2% and the combustion processes in energy generation and transformation – 17,7%.

● **The main sources of HCB emissions** in 2003 are the categories „waste treatment and disposal"-53,4% and „industrial processes" – 46,7%, being for 2003 – 45 kg.

2.3.5.3.3. POPs emissions – PCDDs/PCDFs, PCBs and HCB- by districts for 2002

The sources of **PCDDs/PCDFs and PCBs** emissions in the atmosphere are distributed on the whole territory of the country. 2935 industrial sources generate 0,0001 to 8,29 g of PCDDs/Fs annually. The sources emitting 0,0001 g/year have been excluded from the calculations.

973 industrial sources generate 0,0001 to 3,41 kg of **PCBs** annually. The sources emitting 0,0001 kg/year have been excluded from the calculations.

Table 44 and figure 27 present data about PCDDs/Fs, PCBs and HCB emissions from category sources „combustion processesin energy generation and transformation" and „industrial processes" by districts in Bulgaria for 2002.

Table 44 PCDDs/PCDFs, PCBs and HCB emissions by districts for 2002.

№	District	PCDDs/PCDFs,g/y	PCBs, kg/y	HCB,kg/y
1	**Blagoevgrad**	0,4641	0,1019	
2	**Burgas**	7,8258	0,9351	
3	**Varna**	2,2349	0,7329	
4	**Veliko Tarnovo**	1,0279	0,8058	
5	**Vidin**	0,0688	0,1499	
6	**Vratsa**	0,0674	0,8018	
7	**Gabrovo**	0,1965	0,0078	
8	**Dobrich**	0,0681	0,0002	
9	**Kardzhali**	0,1980	0,0065	
10	**Kyustendil**	10,5287	0,2432	
11	**Lovech**	0,3032	0,0188	
12	**Montana**	0,0468	0,0311	
13	**Pazardzhik**	0,0940	0,0050	
14	**Pernik**	10,0993	0,0101	11,70
15	**Pleven**	0,1676	0,0028	
16	**Plovdiv**	2,0649	0,0301	
17	**Razgrad**	0,0255	0,0247	
18	**Russe**	1,1562	0,0628	
19	**Silistra**	0,2481	0,1806	
20	**Sliven**	0,6523	0,0474	
21	**Smolyan**	0,0790	0,5557	
22	**Sofia-city**	16,1232	12,7108	4,30
23	**Sofia-district**	0,4461	1,9281	
24	**Stara Zagora**	77,1736	6,5007	
25	**Targovishte**	0,0516	1,3828	
26	**Haskovo**	1,0355	12,6443	
27	**Shumen**	0,1946	0,5486	
28	**Yambol**	0,0277	0,0962	
Total for Bulgaria		132,6694	40,5655	16,00

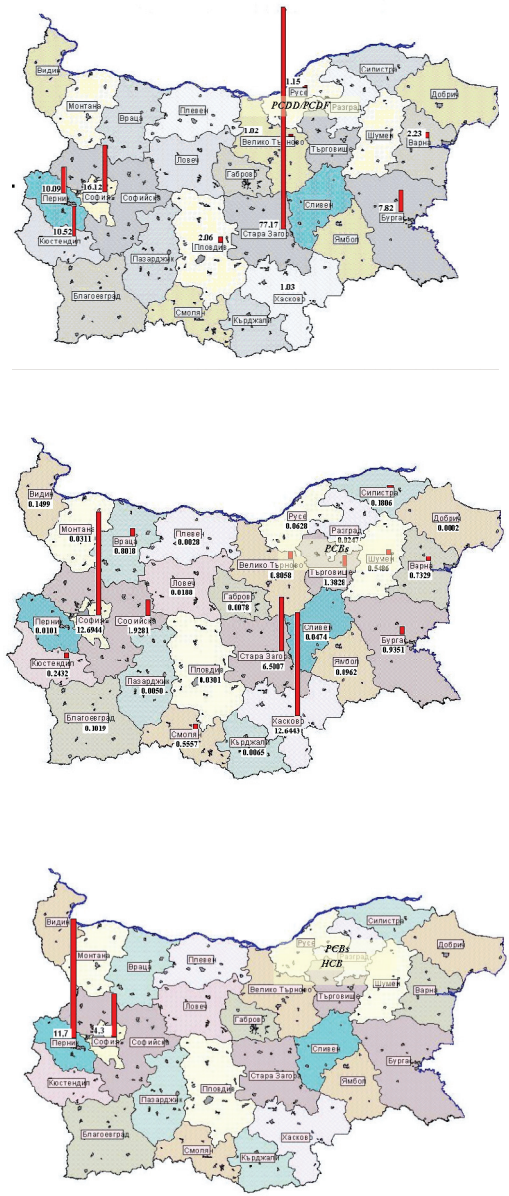


Figure 27 Dioxins /Furans, PCBs and HCB emission sources by districts for 2002

The total **PCDDs/PCDFs, PCBs and HCB** emissions from category sources „combustion processesin energy generation and transformation" and „industrial processes" for 2002 are as follows: **PCDDs/PCDFs** - 132,67 g, representing 60,1% of annual emissions from all category sourcs (218,48 g); ***PCBs*** – 40,56 kg or 16,2% of annual emissions (250,06 kg); ***HCB*** – 16 kg or 42,1% of annual emissions (38 kg).

The main sources of **PCDDs/Fs and PCBs** emissions from category sources „combustion processesin energy generation and transformation" and „industrial processes"are the large industrial centres, where the main part of thermal electric power stations and industrial manufacturers are located. 58% of the emissions released from combustion processes in energy and industry sectors have been registered in Stara Zagora, followed by Sofia-city – 12,2%, Pernik – 7,9% and Burgas – 6 %. The surprising 7,9 % share observed in Kyustendil probably is as a result of Yugoslavia war.

The largest **PCB** emissions have occurred in Sofia-city at 30% (predominantly from thermal power plants), Haskovo area at 30% (predominatnly from the textile industries) and Stara Zagora area at 15% (predominantly from thermal power plants and the food industry).

The industrial **HCB** emission sources are metallurgical enterprises concentrated in the areas around Pernik and Sofia city. Their share is 42,1% from total HCB emitted (38 kg) in 2002 .

Allocated per capita and unit of area, the PCDD/PCDF, PCBs and HCB emission values in base 1990 , 2002 and 2003 are shown in *table 45*.

Table 45 POPs emissions per unit area and per capita in Bulgaria by years

POPs emissions	Year	Per unit area, Total country area (110 993 km²)	Population, number	Per capita
PCDDs/PCDFs				
554,2 g	**Base year 1990**	0,00499 g/km²	8487317	0,0000653 g
218,5 g	**2002**	0,00197 g/km²	7845841	0,0000278 g
254,9 g	**2003**	0,00230 g/km²	7801273	0,0000327 g
PCBs				
258,5 kg	**Base year 1990**	0,00233 kg /km²	8487317	0,0000305 kg
250,1 kg	**2002**	0,00225 kg /km²	7845841	0,0000319 kg
260,7 kg	**2003**	0,00234 kg /km²	7801273	0,0000334 kg
HCB				
544 kg	**Base year 1990**	0,00490 kg /km²	8487317	0,0000641 kg
38 kg	**2002**	0,000342 kg /km²	7845841	0,0000048 kg
45 kg	**2003**	0,000405 kg /km²	7801273	0,0000056 kg

Allocated per capita and unit of area, the PCDDs/PCDFs and HCB emission values versus base year 1990 show a lasting downward trend. The decrease of PCDDs/PCDFs emissions is more the 2 times, while for HCB – 11 times as a result of the decrease in industrial production in Bulgaria after 1990. It is noticed, that allocated per unit area the PCBs emissions are within the same range, while per capita they increase, due probably to the growing consumption of wood and coal in household sector after 1990.

Conclusions

- The sources of **PCDDs/PCDFs and PCBs** emissions in the atmosphere are distributed on the whole territory of the country. 2935 industrial sources generate 0,0001 to 8,29 g of PCDDs/Fs annually. 973 industrial sources generate 0,0001 to 3,41 kg of **PCBs** annually.
- The main sources of **PCDDs/Fs and PCBs** emissions from category sources „combustion processesin energy generation and transformation" and „industrial processes" for 2002 are thermal electric power stations and industrial manufacturers.
- The total **PCDDs/PCDFs, PCBs and HCB** emissions from category sources „combustion processesin energy generation and transformation" and „industrial processes" for 2002 are as follows: **PCDDs/PCDFs** - 132,67 g, representing 60,1% of annual emissions from all category sourcs (218,48 g); **PCBs** – 40,56 kg or 16,2% of annual emissions (250,06 kg); **HCB** – 16 kg or 42,1% of annual emissions (38 kg).
- The largest share of **PCDDs/Fs** emissions for 2002 have been registered in Stara Zagora - 58% followed by Sofia-city – 12,2%, Pernik – 7,9% and Burgas – 6 %.The largest **PCB** emissions have occurred in Sofia-city at 30%, Haskovo area at 30% and Stara Zagora area at 15% .
- The industrial **HCB** emission sources are metallurgical enterprises concentrated in the areas around Pernik and Sofia city, as 73,1% have been registered in Pernik.

PCDDs/PCDFs and HCB emission values, allocated per capita and unit of area, versus base year 1990 show a lasting downward trend in timesq due the decrease in industrial production in Bulgaria after 1990.

- PCBs emissions values, allocated per unit area are almost the same range, while per capita they increase, due probably to the growing consumption of wood and coal in household sector after 1990.

2.3.5.4. Existing policy and regulatory framework

2.3.5.4.1. Existing policy

The direct control of the state and the operation of the sites that are sources of emissions into the atmospheric air and on the emissions of various sources is performed by:

- The Ministry of Environment and Water, the Regional Inspectorates of Environment and Water and the municipal authorities;
- The authorities of the Ministry of Internal Affairs and of the Ministry of Transport – for motor vehicles.

Emission inventory system in Bulgaria

The involved institutions at national and local (sub-national) levels in Emissions inventory are Ministry of Environment and Water /MEW/ respectively Executive Environment Agency /EEA/ and Regional Environment Inspectorate /REIWs/, and National Institute of Statistics /NSI/ .

Two parallel emission inventory programs are conducted in Bulgaria both under the guidance of

Ministry of Environment and Waters The first one covers 150 large point sources and it is conducted by REIWs. The second one covers nearly 2000 point sources and it is conducted by National Institute of Statistics.. The data collected are air pollution control facilities and their efficiency, technological and production data, data for fuels used and fines imposed.

The National Institute of Statistics is the responsible organization for assessment of the following air emissions sources:

- Combustion in energy production and energy transformation;
- Combustion in commercial, institutional and residential sectors and agriculture, forestry, fishing;
- Combustion in industry;
- Production processes;
- Extraction and distribution of fossil fuels;
- Agriculture, forestry and land use change;
- Nature.

The Executive Environment Agency is the responsible organization for assessment of the following air emissions sources:

- Road transport;
- Other mobile sources and machinery;
- Waste treatment and disposal.

Data from the emission inventory are stored at local and national level. On a national level the Executive Environment Agency is the responsible organization for final preparation of the National air emission inventory and data reporting to the the UNECE/CLRTAP (Convention on Long-Range Transboundary Air Pollution).

2.3.5.4.2. Existing regulatory framework

The observation of existing national legislation in regard with POPs releases from unintentional production management guarantees the reducing of POPs negative impacts on the environment and human health.

Standards for PCDD/F, PCB and HCB in air

- **Regulation 1** on Emission Limit Values of harmful substances (pollutants), released into atmosphere from facilities and activities with stationary point sources, promulgated in SG 64/ 05.08.2005, in force from 06.08.2006.

- Emission limit value (ELV) of PCDD/F released into atmosphere from existing and new stationary sources; from sinter plants in the iron and steel industry ; emissions released into exhaust gases from plants for the production of non-ferous metals, excluding aluminium and iron-based alloys and in the processes of melting, alloying and refining of non-ferous metals , excluding aluminium and of copper melting in shaft furnace.

- **Regulation 2** on Emission Limit Values (Concentrations in Waste Gases) for Harmful Substances, Released into the Atmospheric Air from Stationary Sources, promulgated in SG 51/ 06.05.1998, last supplemented in the SG 93/21.01.2003.

- Emission limit value (ELV) of PCDD/F for large stationary sources - waste incinerators for solid household & solid medical waste, waste incinerators for hazardous waste .

● **Regulation 6** on the Conditions and Requirements for Construction and Operation of Waste Incinerators and Co-Incinerators, promulgated in SG 78/07.09.2004.

- Average twenty-four hours values for emission limit values of dioxin and furans in air from waste incinerators .

● **Regulation 13** on Workers Protection from Risks, Related to Chemical Agents' Exposure at Work, promulgated in SG 8/20.01.2004, effective 31.01.2005.

- Limit values of chemical agents (Polychlorinated biphenyls) in occupational air;
- Limit values of the harmful substances(Polychlorinated biphenyls) in the occupational environment of working juveniles (15 – 18 years of age).

Standards for PCDD/F, PCB and HCB in soil

● Regulation **on the Procedures and Manner of Using of Waste-Water Treatment Sludge in Agriculture, promulgated in SG 112/23.12.2004**

- Admissible Limit Values for Polychlorinated biphenyls in sludge meant for use in agriculture.

● Regulation 3 **on the Admissible Content of Harmful Substances in Soils, promulgated in SG 36/08.05.1979, amended SG 54/1997, last amendment SG 39/16.04.2002.**

- Admissible limit values (reference background levels; levels of concerns and concentrations; admissible limit values and intervention concentration levels) for Polychlorinated biphenyls and Hexachlorobenzene in soil, in mg/kg of dry soil.

Standards for PCDD/F, PCB and HCB in water

● **Regulation 1** on the Studying, Use and Protection of Ground Water, promulgated in SG 57/14.07.2000, in effect since 14.07.2000, amended in the SG 64/04.08.2000.

- Recommended Parameters for Protection of Ground Water against Pollution with Polychlorinated biphenyls, Polychlorinated dibenzodioxins, Polychlorinated dibenzofurans and Hexachlorobenzene.

Standards for PCDD/F, PCB and HCB in waste

● **Regulation 8** on the Terms and Requirements for Construction and Operation of Waste Recycling and Disposal Landfills and Other Facilities, promulgated in SG 83/24.09.2004.

- Limit values for total Polychlorinated biphenyls, 7 congeners in waste

Standards for PCDD/F, PCB and HCB in fodders

● **Regulation 24** for maximum admissible concentration of unacceptable substances and products in fodders, promulgated in SG 56/20.06.2003.

- Maximum admissible concentration of PCDDs/Fs and HCB in fodders

Standards for PCDD/F, PCB and HCB in food

● **Regulation 6** for the control measures on residues of veterinary medicinal products and environmental pollutants in life animals and foodstuffs of animal origin, promulgated in SG 32/29.03.2002.

- Residues groups of substances (PCBs) , subject to control in animal species and products of animal origin Bovine, Ovine, Caprine, Swine & Horse meat; Poultry meat; Fishery and Aquaculture products; Row milk and eggs; Rabbit meat, meat from farmed game and honey.

● **Regulation 31** on the maximum admissible quantities of pollutants in food, promulgated in SG 88/08.10.2004.

- Limit values for Dioxins/Furans in some food – meat and meat products (cattle, sheep, farm raised fowl and game, pigs, liver and derivative products from terrestrial animals, meat from fish and fish products, milk and dairy products, hen eggs and egg products); animal fats from (ruminants, farm raised fowl and game, pigs, mixed animal fats, vegetable oils and animal fats and fish oils for human consumption).

2.3.5.5. Environmental Monitoring Levels and Human Exposure

2.3.5.5.1. Environmental Exposure routes and behaviour of POPs releases

The emissions of PCDD/F, PCB and HCB are released into the environment by means of direct emission and/or transfer by air, water, soil and waste (*Picture 8*).

Picture 8 Routes of entry of PCDD/F, PCB and HCB into the environment

The exposure routes and behaviour of dioxins/furans, PCBs and HCB into the environment – air, water and soil are indicated on *Table 46*.

Table 46Environmental exposure routes and Behaviour of Dioxins/Fs, PCBs and HCB

Environment media	Dioxins/Furans PCDDs/PCDFs	Polychlorinated biphenyls PCBs	Hexachlorobenzene HCB
AIR Environmental exposure routes and Behaviour	**Dioxins/ Furans** are released into the air from combustion processes in industry; accidental fires; uncontrolled municipal solid waste & tire burning; forest fires and uncontrolled stubble-fields burning; in emissions from industrial incinerators and motor vehicles. **Dioxins and furans** are emitted as gas or bound to the particulates dispersed in the waste gases-drops, dust, soot, ash. In the form of gas, they are photo-degradable. However, their low vapour pressure means that usually they are emitted into the atmosphere adsorbed onto various particles and this stops them form disintegrating. This explains their ability to stay in air for long periods of time and to be carried along large distances. The Dioxins life-times in the atmosphere, depending on the rate of chlorination vary from 0,5 to 10 days	**PCBs** enter the air during their use and disposal; from accidental spills and leaks; and from leaks or fires in products containing PCBs. **PCBs** are heavier than air and can settle in the ground layer. PCB molecules bind to volatile particulates and to fine aerosols of less than 0.05-20 мм in size, they spread into the atmos-phere, and settle at long distances, mainly in areas of cold climate. PCBs half-times in the atmospheric air vary from 3 weeks to 2 years.	**HCB** enter the air as by-product during the manufacture of certain chemicals. Small amounts can also be produced during combustion of municipal waste. Under ordinary conditions **HCB** not much evaporates into the air. Once in air, it can be carried out long distances. Atmospheric air pollution with **HCB** bound to particulate matter is a serious threat.Hexachlorobenzene is resistant to ultraviolet radiation. Fotodegradation in the atmos-phere takes approximately 2 years and the metabolites may cause the formation of greenhouse gases or are greenhouse gases themselves. HCB has an estimated half-life in air of 0.5-4.2 years.
WATER Environmental exposure routes and Behaviour	**Dioxins/Furans** enter water as a result of depo-sition after emitted to the atmosphere from combus-tion sources. When released in waste waters, some Dioxins/Furans are broken down by sunlight, some evaporate to air, but most attach to soil and settle to the bottom sediment in water. In water, **dioxins and furans** exhibit extremely low solubility but, also, hibh capacity for adsorption into sediments and into the biota. The half-life times of dioxins/furans depending on the rate of chlorination in water varies between 2.6 and 4 days.	**PCBs** enter the water during their disposal and from accidental spills and leaks. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. **PCBs** evaporate from ground and water surfaces over several days. They accumulate in the sediments on water basin bottoms and may, through infiltration, pollute ground water. Local pollution is possible also in result of emergencies, acci-dents or illegal activities. The half-life of PCBs in water is more than 6 years.	**HCB** enter the water from contaminated air. Once in water, it binds to sediments and settles to the bottom. **HCB** does not dissolve in water but is carried by it, and in this way pollutes other water basins and, thus, soils. The half-life of HCB in rivers varies between 0.3 and 3 days.

Environment media	Dioxins/Furans PCDDs/ PCDFs	Polychlorinated biphenyls PCBs	Hexachlorobenzene HCB
SOIL Environmental exposure routes and Behaviour	**Dioxins/Furans** enter in soil by atmospheric depo-sition from combustion and manufacturing processes and disposal of contaminated wastes by means of wet and dry deposits adsorbed onto solid particles and water drops. The poor waeter solubility of furans and dioxins means that they do not exfiltrate from soils into the ground water and does not wash away from surfaces. The evaporation of these compounds from the soil surface is also a limited process because of their low vapour pressure. The main route for transition of PCDD/F from the soil surface into air is by carrying along into the air stream of suspended particulates onto which these have adsorbed. Estimates of the half-life of TCDD on the soil surface range from 9 to 15 years, whereas the half-life in subsurface soil may range from 25 to 100 years (Paustenbach et al. 1992).	**PCBs** enter soil during their disposal; from accidental spills and leaks by means of wet and dry deposits adsor-bed onto solid particles and water drops. PCBs also bind strongly to soil. PCBs can still be released to the environ-ment from hazardous waste sites; illegal or improper disposal of indus-trial wastes and consumer products; leaks from old electrical transformers containing PCBs. Increasing chlorine atoms in PCBs increases the adsorption and resistance to biodegradation in soils, and reduces the speed of infiltration. The half-life of PCBs in soil is more than 6 years.	**HCB** enter the soil from contaminated air and water. It sticks strongly to soil. **HCB** is not heavily absorbed in soil. Its half-life in soil is 2,7 – 5,7 years. HCB can be released to the environment from hazardous waste sites and during combustion of municipal waste.
BIOTA Environmental exposure routes and Behaviour	**Dioxins/Furans** low levels may build up in the food chain. Low levels of Dioxin/Furans are taken up by eating contaminated food, breathing contaminated air and drinking polluted water. PCDDs/PCDFs have a relatively high bioaccumulation potential and long half-life in biota (log K_{OW}: 6.60 – 8.20).	PCBs are taken up by small organisms and fish in water. They are also taken up by eating contaminated food (fish, meat, and dairy products), breathing air near hazardous waste sites and drinking contaminated well water. PCBs have extremely long half-lives in biota as for some species it could reach more than 10 years (log K_{OW} 4,3-8,26).	Low levels of HCB are taken up in eating contaminated food (e.g, fish, meat, milk, dairy products), drinking contaminated water, breathing contaminated air and being in contact with contaminated soil. HCB has a relatively high bioaccumulation potential and long half-life in biota (log K_{OW} 3.93-5.73).

2.3.5.5.2.Levels in the Environment

2.3.5.5.2.1. Levels of Dioxins/Furans, PCBs and HCB in air

POPs releases into the air are calculated by balance determination with adapted to the EU CORINAIR-94 Inventory Manual (Selected Nomenclature for Air Pollution For CORINAIR 94 Inventory (SNAP 94).

There are no international regulatory provisions for implementing of monitoring for Air quality assessment concerning POPs releases.

2.3.5.5.2.2. Levels of Dioxins/Furans, PCBs and HCB in soil

Dioxins/Furans (PCDDs/PCDFs)

There are no international regulatory provisions for monitoring of soil contamination , concerning PCDDs/Fs releases.

Polychlorinated byphenils (PCBs)

In the period 1997-2002, the soil-chemistry monitoring of the MOEW covered 231 soil samples distributed uniformly across Bulgaria's agricultural lands and analysed for content of 8 PCB congeners. *Table 47* shows the range of PCBs concentrations for 8 congeners and sum PCB_6 in soils for Bulgaria for the period 1997-2002.

Table 47 PCBs concentration ranges in soils in Bulgaria

PCBs congener	Range (мg/kg)
PCB 28	0,003 ÷ 4,37
PCB 52	0,007 ÷ 5,76
PCB 101	0,001 ÷ 3,04
PCB 105	0,029 ÷ 0,25
PCB 118	0,004 ÷ 0,71
PCB 138	0,004 ÷ 3,038
PCB 153	0,005 ÷ 2,65
PCB 156	0,031 ÷ 0,41
PCB 180	0,003 ÷ 5,75
PCBs total	**0,009 ÷ 12,47**

- The analysis of the data shows that no PCBs congeners above the admissible limit value (ALV - 0,2 mg/kg) have been measured .
- Measurements in individual local points have shown levels of PCB congeners above the levels of concern(0,001 ч 0,004 mg/kg).

The sum PCBs content in soil is significantly (by a multiple factor) below the levels of concern which allows the assumption that no potential threat exists for pollution of soil with PCBs.

Hexachlorobenzene (HCB)

The soil-chemistry monitoring included 4 years of systematic gathering by the MOEW of 277 soil samples for HCB residues analysis, out of which 124 were collected in the year 2000. The soil sampling points in 1997 had been orientated towards places with assumed soil pollution. The point selection methodology was changed during the period 1998-2000 and the soil samples were equally distributed along the country's agricultural land. The sample analysis was made using gas-chromatograph by means of MS and EC detector, according to ISO/CD 10382.2.

The three levels of reference values – levels of concern, admissible limit values and intervention levels – have been used to evaluate the results, according toBulgarian legislation.

Table *48* shows the number of samples, analysed for HCB in soils for the period 1997 ч 2000 in Bulgaria.

Table 48 Number of samples analysed for HCB in soil by years

Year	1997				1998				1999				2000			
Number of samples	Total	<MDL	<ALV	>**ALV**	Total	<MDL	<ALV	>**ALV**	Total	<MDL	<ALV	>**ALV**	Total	<MDL	<ALV	>**ALV**
Total for Bulgaria	12	9	3	**0**	52	19	33	**0**	89	67	22	**0**	124	98	26	**0**

MDL *– minimum detection level*
ALV *– admissible limit value 0,25 mg/kg*

The analysis results from soil monitoring for HCB show the following:

- Out of 277 soil samples analyzed for the period 1997 ч 2000 only 30,3% (84 samples) show HCB residues below ALV, and the remaining 193 soil samples(69,7%) are below the minimum detection level (MDL);
- The registered levels of HCB in soil are 0.02 ч 4,01 мg/kg, which are significantly below ALV (0,25 mg/kg);

There are no HCB polluted soils in Bulgaria.

2.3.5.5.2.3. Levels of Dioxins/Furans, PCBs and HCB in ground water

Dioxins/Furans (PCDDs/PCDFs)

There are no international regulatory provisions for monitoring of groundwater contamination , concerning PCDDs/Fs releases.

Polychlorinated byphenils (PCBs)

Table 49 presents data for number of samples, analysed for PCBs congeners (PCB 28; PCB 52; PCB 101; PCB 138; PCB 153 and PCB 180) in ground water from the National Ground Water Monitoring Network. PCB 105 and PCB 118 and PCB 156 had not been analyzed.

Table 49 Number of samplesq analysed PCBs in ground water for 2001

Year	Area	Municipalities, total	Urban centres	Number of samples for PCB 28	Number of samples for PCB 52	Number of samples for PCB 101	Number of samples for PCB 138	Numbe of samples for PCB 153	Number of samples for PCB 180
2001	**Kardzhali**	3	3	4	4	4	4	4	4
2001	**Pazardzhik**	3	7	8	8	8	8	8	8
2001	**Plovdiv**	5	6	6	6	6	6	6	6
2001	**Haskovo**	6	10	8	9	9	10	10	10
	TOTAL	17	26	26	27	27	28	28	28

The analysis of total 164 ground water samples in 26 urban places showq that all levels of the six PCB congeners are below the minimum detectable level (< MDL) . Ground water in excellent condition are the water which parameters are below the environmental threshold (0,01 mg/l), under the regulatory provisions.

- In Bulgaria for 2001 there are no ground water polluted with PCBs.
- All values were below the ecological threshold and this classifies the ground water as ground water in excellent condition.

Hexachlorobenzene (HCB)

In the period 1998-2002 two groups of samples have been taken for analysis of hexachlorobenzene in ground water – at high ground water level in spring time, and low level by the later summer and early fall. The samples taken for HCB in ground water were totally 287, and in the year 2002 they were 70.

Table 50 presents number of ground water samples, analysed for HCB above and below the ecological threshold (ET)in Bulgaria from the National Ground Water Monitoring Network.

Table 50 Number of samples analysed for HCB content in ground water in Bulgaria by years

Year	1998				1999				2000				2001				2002			
Number of samples	Total	<MDL	< ET	> ET	Total	<MDL	Total	> ET	< ET	<MDL	< ET	> ET	Total	<MDL	< ET	> ET	Total	<MDL	< ET	> ET
Total	**49**	**35**	**14**	**0**	**52**	**48**	**4**	**0**	**51**	**50**	**1**	**0**	**65**	**62**	**3**	**0**	**70**	**2**	**0**	

MDL – *minimum detection level*
ET – *ecological threshold 0,1 мg/l*

The analysis results from monitoring of ground water shows the following:

During the period 1998-2002 no HCB in ground water above the pollution threshold of 5 мg/l and above the ecological threshold of 0,1 мg/l have been registered in Bulgaria.

From totally analysed 287 groud water samples 91,6% (263 samples) are below MDL and only 8,4% (24 samples) are below ET.

- There is no HCB polluted ground water in Bulgaria for the investigated period.
- All values were below the minimum detection level in the period 1998 – 2002 and this classifies the ground water as ground water in excellent condition.

2.3.5.6. Levels of PCDD/Fs, PCBs and HCB in food

The results of control on Residues of PCBs in life animal and animal products - red meat; poultry; hen eggs; raw milk; fish; bee honey; farmed and wild game in 2003, performed by NVMS at MoAF under the National Monitoring Program for Control on Residues (NMPCR)indicate the following:

- TNo presence of any residues from B (3)(a) group organochlorine compounds – PCBs in the tested samples of Live Animals, Fresh Meat, Poultry, Fish, Farmed & Wild Game, Raw Milk, Hen Eggs and Bee Honey in Bulgaria for the Year 2003 has been detected.
- TNo investigations for PCDDs/PCDFs and HCB in food had been performed.

2.3.5.7. Levels of PCDD/Fs, PCBs and HCB in animal world

The study of PCB in subcutaneous fat of a bear killed in April 2004 in Central Stara Planina, Troyan area, showed 142 ng/g fat of polychlorinated biphenyls (analysis protocol 140 dated 15.06.2004, issued by the Food Chemistry Laboratory at the NCHMEN in the town of Sofia).

2.3.5.8. Human exposure and health impact

2.3.5.8.1.Human exposure

Human exposure to background contamination with PCDD/PCDF is possible *via* several routes: Inhalation of air and intake of particles from air; Ingestion of contaminated soil; Dermal absorption; Food consumption.

Humans occupy a top position in terrestrial and aquatic foodchains and as a result consume a high proportion of food in which persistent lipophilic compounds can be effectively biomagnified. Once ingested, POPs sequester in body lipids, where they equilibrate at roughly similar levels on a fat-weight basis between adipose tissue, serum, and breast milk. Milk monitoring is far more widely practised due to the relatively easy sample collection.

2.3.5.8.2.Levels in human tissue - Human milk

A considerable number of studies have been produced on breast milk mainly aimed to characterise breast-fed infant exposure and the associated risk.

Mothers' age, number of breast-fed infants and dietary habits are in fact crucial parameters in determining POPs body burden and hence milk contamination.

PCBs

The international project conducted in 19 countries (Brasil, Bulgaria, Croatia, the Czech Republic, Egypt, Finland, Hungary, Ireland, Italy, New Zealand, Norway, Romania, Russia, Slovakia, Spain, Sweden, the Netherlands, the Unkraine) by the WHO – „WHO-coordinated Exposure Study on the Levels of PCBs, PCDDs and PCDFs in Human Milk, Organohalogen Compounds, 2003" carried out a study in Bulgaria of PCDD/PCDF content in mother's milk of 30 healthy women distributed by 10 of three regions in Bulgaria (Bankya – environmentally clean and two (Sofia and Blagoevgrad) polluted in different degrees. The results show the highest content of PCB in human milk from Blagoevgrad, followed by that of Sofia. Lowest levels were found in the milk from mothers from the environmentally clean region of Bankya (*Table 51*).

Table 51 PCB levels in human milk (pg TEQ/g fat)

	Bankya	Sofia	Blagoevgrad
WHO - PCB	3.74	4.21	4.70
Sum WHO – PCDD/PCDF + PCB	8.82	10.35	11.81

The data from the study of the three PCB representatives -138, 153 and 180 – follow a similar trend (*Table 52*).

Table 52 Level of the most important PCB markers in human milk (ng/g fat)

PCB	Bankya	Sofia	Blagoevgrad
PCB 138		14.06	16.33
PCB 153	11.37	17.42	20.29
PCB 180	6.38	9.40	13.20

PCB levels below 5 pg TEQ/g fat and sum content of the three parameters below 40 ng/g fat have been established in human milk in Brasil, Australia, New Zealand, Hungary and Bulgaria. The highest PCB content was registered in the Ukraine, Italy, the Czech Republic and Russia – higher than 15 pg TEQ/g fat. The highest total content of the three PCB representatives 138, 153 and 180 in Spain, Slovalkia and the Czech Republic (400 – 500 ng/g fat).

PCDD/PCDFs

WHO carried out periodically monitoring programmes on the levels of PCDD/PCDFs and dioxin-like PCBs in human milk. The results of the third round of the WHO 2001-2002 co-ordinated exposure study show that the lowest levels of PCDDs/Fs have been found in Bulgaria (median value of 6,14 pg WHO-TEQ/g fat) and of dioxin-like PCBs – being one of the lowest (median value of 4,21 pg WHO-TEQ/g fat) after Hungury. (*Table 53*)

Table 53 Levels of PCDD/PCDFs and dioxin-like PCBs in human milk (2001-2002)
[pg WHO-TEQ/g fat][1]

Country	PCDDs/Fs		Dioxin-like PCBs		Number of pools
	median	range	median	range	
Bulgaria	6.14	5.08-7.11	4.21	3.74-4.70	3
Czech Republic	7.78	7.44-10.73	15.24	14.32-28.48	3
Finland	9.44	9.35-9.52	5.85	5.66-6.03	2
Hungary	6.79	5.26-7.46	2.87	2.38-4.24	3
Ireland	6.91	6.19-8.54	4.66	2.72-5.19	3
Norway	7.30	7.16-7.43	8.08	6.56-9.61	2
Romania	8.86	8.37-12.00	8.06	8.05-8.11	3
Russia	8.88	7.46-12.93	15.68	13.38-22.99	4
Slovak Republic	9.07	7.84-9.87	12.60	10.72-19.49	4
The Netherlands	18.27	17.09-21.29	11.57	10.90-13.08	3
Ukraine	10.04	8.38-10.16	19.95	14.10-22.00	3

Industrialised countries like The Netherlands show relatively high levels of PCDD/PCDFs. Elevated levels of dioxin-like PCBs were found in human milk from Ukraine, Russia and the Czech Republic.

2.3.5.8.3. Human health effects

Many laboratory experiments have been conducted to test the relationship between POPs exposure and a range of adverse outcomes in animals. *Table 104* shows some possible effects that can be produced by some of POPs – dioxins/furans, PCBs and HCB and Category of carcinogenicity by JARC* *(table 54)*.

1 Regiaonally based assessment of persistent toxic substances,Global Report 2003, UNEP

Table 54 Potential effects of individual POPs

Types of Effects	PCDDs	PCDFs	PCBs	HCB
Reproduction and/or development	X	X	X	X
Cytochrome P450 system	X	X	X	X
Porphyria	X	X	X	X
Immune system	X	X	X	X
Thyroid and retinol effects	X	X	X	X
Skeletal changes	X	X	X	
Endocrin disruptor	X	X	X	
Carcinogenic effects	X	X	X	X
Category of carcinogenicity **JARC***	**Group 1 –** carcinogen to humans: **Only for 2,3,7,8- Cl_4DD Group 3** - Not classifiable as carcinogen to humans. For all other PCDDs	**Group 3** – not classifiable as carcinogen to humans:	**Group 2A -** probable carcinogen to humans	**Group 2B** - possible carcinogen to humans

* ***IARC –*** *Classification of agents, mixtures and exposures according to their carcinogenic risk to humans in accordance with the procedures adopted as standard IARC practice:*

Group 1 - carcinogenic to humans; Group 2A - probably carcinogenic to humans; Group 2B - possibly carcinogenic to humans; Group 3 - not classifiable as to carcinogenicity to humans;

Detailed possible effects of POPs on human healt are shown on *Table55*.

Table 55 Possible POPs effects on human health

POPs	Human health effects of POPs
Dioxins/Furans	**Dioxins/Furans** exposures to humans are associated with: an increased risk of severe skin lesions (chloracne and hyperpigmentation), altered liver function and lipid metabolism, general weakness associated with drastic weight loss, depression of the immune system, and endocrine and nervous system abnormalities. **2,3,7,8-TCDD** is a potent teratogenic and fetotoxic chemical in animals and a potent promoter in rat liver carcinogenesis. TCDD also causes cancers of the liver and other organs in animals. The most sensitive groups are fetus and neonatal infants.
PCBs	**PCBs** can cause: a skin condition called chloracne, which produces pustules, black-heads and cysts; liver and thyroid gland damage, skin and eye changes, immunitoxicity, neurobehavioural deviations, reduced body mass of the newly born, reprotoxicity and carcinogenity. PCBs have also been classified as endocrine disruptors.
HCB	**HCB** effects on human health are associated with: alterations in liver enzyme activities and liver and thyroid gland damage, neurobehavioural deviations, depression of the immune system, and endocrine and nervous system abnormalities, reduced body mass of the newly born and reprotoxicity. And carcinogenity. HCB Can produce skin eruptions and colour changes HCB is known to cause liver disease in humans (porphyria cutanea tarda) and cancer of the liver, kidneys and thyroid.

The PCDDs/PCDFs, PCBs and HCB source category inventory and Environment Pollution assessment give reson to assume that hot spots around industrial and energy generation and transformation sources and landfills for disposal of industrial and municipal waste potentially exist.

No date exists for the level of environment pollution from industrial accidents, forest fires and uncontrolled stubble-fields burning as a source of Dioxin/Furans"

No date from health and epidemiological studies of general population exposured to dioxins and furans have been published. No biological monitoring of risk target groups of population had been performed.

From the assessment of occupational and environmental pollution with PCBs in Bulgaria it could be suggested that a health risk exists within the regions of thermal electric power stations using coal and mazut , around transformers and capacitors and badly maintained electrical PCBs equipment, near to iligal depot for municipal waste.

In Bulgaria no studies has been carried out on the levels of PCBs in human body for target groups of workers and risk groups of general population as well as negative health effects assessment on target organs and systems.

No data for acute and chronic intoxications with PCDDs/Fs, PCBs and HCB are available.

Conclusions:

- IOne of the lowest levels of PCBs and PCDDs/PCDFs in breast milk have been found in Bulgaria for the period 2001 – 2002 within the European countries.
- INo studies have been carried out in the counry for the levels of PCDDs/PCDFs, PCBs and HCB in serum and adipose tissue as well as for HCB levels in breast milk.
- IIn Bulgaria no health and epidemiological studies has been carried out on risk groups of general population for negative health effects of PCDDs/Fs, PCBs and HCB on target organs and systems.
- INo data for acute and chronic intoxications with PCDDs/Fs, PCBs and HCB are available.

2.3.6. INFORMATION ON THE STATE OF KNOWLEDGE ON STOCKPILES, CONTAMINATED SITES AND WASTES, IDENTIFICATION, LIKELY NUMBERS, RELEVANT REGULATIONS, QUIDANCE, REMEDIATION MEASURES AND DATA ON RELEASES FROM SITES

The storage facilities for unusable and obsolete pesticides are a source of local environmental pollution. The storage facilities are subject to annual inventorying and the statusof warehouses and of pesticides stored there are monitored. The construction of centralized municipal warehouses and BB cubes conforming to the legislative framework, responsible storage of available stockpiles, cleaning up of emptied warehouses are activities that illustrate consistency and sustainable management of the issue of prohibited and obsolete pesticides.

2.3.6.1. POPs pesticides stockpiles

The assumed POPs pesticides stockpiles at the end of 2003 in Bulgaria are in the range of 22.25 t - 25.82 t.

The obsolete pesticides mixtures, consisting of or contaminated with POPs comprise of approx. 30.06 t.

The assumed POPs pesticides stockpiles are totaling between 52.3 t ч 55.9 t, stored in 99 sites on the territory of 22 districts.

2.3.6.2. Obsolete pesticides stockpiles

At the end of 2004 the total amount of obsolete pesticides stockpiles is 11222 t, stored in 561 warehouses and 1255 BB-cubes.

The „unknown" obsolete pesticides comprise of 11219 t, out of which 4703 t are stored in 84 centralized warehouses, 2308t – in 477 unrepaired storages and 4211t – in 1255 BB-cubes.

Total obsolete pesticides stockpiles stored in safe warehouses, conforming to all European requirements for safe and environmentally sound storage of hazardous waste and in BB cubes is 8914 t.

The amount of „unknown" obsolete pesticides stored in 477 unrepaired and unsafe warehouses is 2308 t.

The insufficient information about the assumed available approx. 52.3 t ч 55.9 t obsolete POPs pesticides and mixtures, consisting of or contaminated with POPs, contained exactly in these 2308t obsolete pesticides requires the implementation of detailed inventory of the „unknown" obsolete pesticides, stored in 477 unrepaired warehouses.

2.3.6.3. PCBs waste

Waste, containing PCBs are phased-out equipment (capacitors), containing PCBs and waste transformer oils, containing PCBs. The waste, containing PCBs are stored on the territory of 8 districts. (table 56).

Table 56 Phased-out equipment and waste, containing PCBs

№	DISTRICT	Transformer oils, 100% PCBs Waste in stock tonnes	Transformer oils, PCBs assumed Waste in stock tonnes	Total PCBs Transformer oils Waste in stock tonnes	PCBs Capacitors Out-of-use on stock pieces	Capacitors PCBs assumed Out-of-use on stock pieces	Total PCBs Capacitors Out-of-use on stock pieces
1	V.Tarnovo		4,72	4,72	50		50
2	Vratza		2,62	2,62			
3	Lovech				21	9	30
4	Pazrdjik				87		
5	Pernik	3,85		3,85			
6	Sofia-city	6,03		6,03	456	46	502
7	Sofia-distr.					48	48
8	St. Zagora		2,9	2,9		30	30
9	Haskovo					97	97
	Total	9,88	10,24	20,12	614	230	844

- Total quantity of waste PCBs transformer oils is 20,12 t, out of which 100% PCBs are 9,88 t, and PCBs assumed - 10,24 t. Waste transformer oils, containing PCBs are in transformer holders warehouses, located in 5 districts.
- Total pieces of PCBs capacitors are 844, out of which PCBs - 614 , and PCBs assumed – 230. Out-of-use capacitors, containing PCBs are in capacitor holders' warehouses, located in 6 districts.

2.3.6.4.Regions with potential for formation of PCBs emissions (PCDDs/ PCDFs, PCBs and HCB) in the environment

Regions with potential for formation of POPs emissions (PCDDs/PCDFs, PCBs and HCB) in the environment are the large industrial centres, where the main part of thermal electric power stations and industrial manufacturers are located as well as the large cities, where the main roads and R.W. lines pass by.

In 2002, 58% of **PCDDs/Fs** emissions released from combustion processes in energy and industry sectors have been registered in Stara Zagora, followed by Sofia-city – 12,2%, Pernik – 7,9% and Burgas – 6 %. The surprising 7,9 % share observed in Kyustendil probably is as a result of Yugoslavia war.

The largest **PCB** emissions have occurred in Sofia-city at 30% (predominantly from thermal power plants), Haskovo area at 30% (predominatnly from the textile industries) and Stara Zagora area at 15% (predominantly from thermal power plants and the food industry).

The industrial **HCB** emission sources are metallurgical enterprises concentrated in the areas around Pernik and Sofia city. Their share is 42,1% from total HCB emitted (38 kg) in 2002 .

- Therefore, regions with potential for formation of POPs emissions (PCDDs/PCDFs, PCBs and HCB) are theregions, close to the big thermal electric power stations, using lignite coal and mazut, the large industrial manufacturers, using mazut as fuel and the large cities, where the main roads and R.W. lines of the country pass by. The risk of air pollution with dioxins/furans and PCBs from forest fires, the municipal waste disposal sites and uncontrolled burning of solid municipal waste, stubbles and tires should not be neglected.

2.3.6.5. Hazardous Waste, containing POPs

Data about hazardous waste is collected in Bulgaria only within the system of the MoEW (by the EEPA) by means of information cards documenting the name, quantity, properties, movement, storage and disposal of waste by enterprises whose activity involves hazardous waste generation and/or treatment.

Table 57 Type and quantity of POPs containing hazardous waste in 2004

Code	Waste type	Unit	Quantity
02 01	**Waste from agriculture (orchards, flowers and gardening), forestry, hunting and fisheries**	tons	
02.01.08	**Agrochemical waste containing hazardous substances (obsolete and expired PPCs):**		**11222**
	- in storage;	tons	7011
	- in BB cubes	tons	4211
	including		
	Obsolete POPs pesticides and their mixtures	tons	**52,3÷55**
	- Aldrin, Dieldrin, Endrine, Toxaphene, Heptachor and DDT	tons	22 ,3÷25 ,9
	- Mixtures of POPs pesticides with „unknown„ composition	tons	30,06
13 03	**Used insulation and heat transferring oils**		
13.03.01	Processed insulation and heat transferring oils containing PCBs	tons	**20,12**
	- transformer oils containing 100% PCBs	tons	9,88
	- transformer oils with assumed PCB content	tons	10,24
16 02	**Waste from electrical and electronic equipment**		
16.02.09	**Transformers and condensers containing PCB**	units	**844**
	- Phased out capacitors, containing PCBs	units	614
	- Phased out capacitors, containing PCBs assumed	units	230

- The waste stockpiles of POPs pesticides and mixtures of obsolete pesticides, containing or contaminated with POPs are stored in warehouses and BB-cubes;
- The pfased out PCBs equipment and waste oils stocks are stored in storehouses of PCBs equipment holders.

2.3.6.6. Potentially contaminated sites

The pollution might be caused by a point (local) source or by diffusion. Local pollution is usually associated with operating or closed mining or industrial enterprises, whereas the main contributors to diffusion are agricultural practices. Soil pollution by local or diffusion sources leads to soil functions damage and surface and ground waters pollution. The availability of pollutants, exceeding certain levels, may lead to negative consequences for the whole food chain, and thus – for human health, all kinds of eco-systems and other natural resources.

Diffusion soil pollution

No new POPs soil pollution levels were recorded in 2003.

At all points the measured content of POPs pesticides, PCBs and HCB is considerably below the reference background values and no potential threat exists from POPs soil pollution. Isolated local cases of DDT soil pollution were registered.

The monitoring results show that at this stage the agricultural activities do not result in further soil load. That fact is due on the one hand to the reduced fertilizer and pesticides consumption, , but also to the performed programs for environmental-friendly agriculture and biological production.

Local soil pollution

Soil pollution from local sources results from industrial activities and waste management and is mainly identified as waste depots, spills and industrial accidents, fertilizer and pesticide storage sites. The industrial activities (historical or current) result in considerable risk for soils and ground waters.

Local soil pollution are not investigated well and registered in the country.
The warehouses for safe storage of obsolete pesticides represent one of the sources of local soil pollution.

2.3.7. SUMMARY OF FUTURE PRODUCTION, USE AND RELEASES OF POPS

2.3.7.1. POPs pesticides

- POPs pesticides have never been produced in Bulgaria;
- POPs pesticides import and use are banned.
- No future production of POPs pesticides is foreseen in the country.

2.3.7.2. PCBs in equipment and oils

- PCBs and equipment, containing PCBs have never been produced in Bulgaria;
- PCBs import is banned.
- The marketing and use of PCBs and preparations, including waste oils with content of PCBs greater than 0,005 % (50 mg/kg) are prohibited.
- PCBs use is allowed only for electrical equipment in close systems – transformers and capacitors.

- Equipment with PCBs concentration in the fluid greater than 0.05 % by weight (500 mg/kg) and volume above 5 dm^3 - latest by the end of 2010.

- Equipment with PCBs concentration in the fluid greater between 0,005 % by weight (50 mg/kg) and 0,05 % by weight (500 mg/kg) and volume above 5 dm^3 - at the end of their useful lives , but not later than the end of 2025.

- No future production of PCBs is foreseen in the country.

2.3.7.3. POPs releases from unintentional production – PCDDs/Fs, PCBs and HCB

For the projected POPs releases from unintentional production (PCDDs/Fs, PCBs and HCB), MoEW has developed prognosis for the period 2000 – 2020 with two options: pessimistic, and optimistic.

Table 58 Prognosis of projected annual emission values of PCDDs/PCDFs for the period 2000 ч 2020 and current value for 2000

DIOX g/year	pessimistic	optimistic
2000	232,528	232,528
2007	244,383	263,813
2010	241,357	270,832
2015	264,545	296,443
2020	271,493	323,89

Table 59 Prognosis of projected annual emission values of PCBs for the period 2000 ч 2020 and current real value for 2000

PCBs kg/year	pessimistic	optimistic
2000	228,475	228,475
2007(8)	200	228,967
2010	214,1	262,114
2015	231,024	305,7
2020	246,808	355,348

Table 60 Prognosis of projected annual emission values of HCB for the period 2000 ч 2020 and current value for 2000

HCB kg/year	pessimistic	optimistic
2000	54,3	54,3
2007	64,1	78,3
2010	68,7	91,7
2015	72,9	103,1
2020	77,3	116,06

2.3.8. EXISTING PROGRAMMES FOR MONITORING RELEASES AND ENVIRONMENTAL AND HUMAN HEALTH IMPACTS

2.3.8.1. National environmental monitoring system (NEMS)

A number of subsystems for monitoring of harmful pollutants in the environmental media including POPs exists in Bulgaria as a part of NEMS.

For the purposes of the information support of the National Environmental Monitoring System, a National Automated System for Environmental Monitoring (NASEM) is established at national, basin, and regional level. Methodological guidance of the monitoring activity shall be provided by the Executive Environment Agency (EEA). The state of the environment is assessed at regional and national level, respectively, by the RIEWs and the Executive Environment Agency. The data on and assessments of the state of the environment are published in a quarterly and annual Bulletin on the State of the Environment.

2.3.8.1.1. Air

MINISTRY OF ENVIRONMENT AND WATER

- **National Environment Monitoring System, Emissions control of harmful substances in atmospheric air**

The database includes information about: emissions from all the sources of harmful substances,

from anthropic activity and nature. They are summarized in 11 basic groups. The emissions of the following harmful substances are controlled: dust, sulphur dioxide, nitrogen dixide, PAH, PCBs, HCB, PCP, DIOX, methane, non-methane carbons, ammonia, carbon oxide, Hg, Cd and Pb.

2.3.8.1.2. Water

MINISTRY OF ENVIRONMENT AND WATER, Executive Environment Agency

● **National Environment Monitoring System, Subsystem „Water", Functional subsystem „Underground water"**

The database contains information from sampling site on underground water manitoring of National Environment Monitoring System, RIEWs, dates of sampling, No of protocol, values of physical-chemical parameters determined as well as values for Persistent Organic Pollutants (POPs) found – pesticides, PCBs and HCB.

Groundwater samples are analysed for PCBs congeners (PCB 28; PCB 52; PCB 101; PCB 138; PCB 153 and PCB 180). PCB 105 and PCB 118 and PCB 156 congeners are not analyzed.

Two groups of samples are taken for analysis of HCB in ground water – at high ground water level in spring time, and low level by the later summer and early fall.

● **National System for Environmental Monitoring, Subsystem: „Water", Functional subsystem „Surface waters"**

National System for Environmental Monitoring, Functional subsystem „Surface waters**"** consists of 253 stations as follows: 185 river stations (10 of them located on the Danube river), 8 lake stations, 26 dam lake stations and 24 Black sea stations.

Measured Indicators are Temperature, Activity reaction /pH/, dissolved oxygen, oxygen saturation, Biochemical oxygen demand (BOD5), COD-Mn, COD-Cr, Electrical conductivity, suspended solids, dissolved solids, Chloride ions, Sulphate ions, Ammonium ion, nitrite and nitrate nitrogen, Phosphates, Total hardness, Cyanides, petroleum products and extractable substances with tetrachlormethane, Iron, Chromium, Lead, Copper, Zinc, Cadmium, Nickel, Sodium, Tin, Arsenic. Surface water samples are taken monthly from rivers and 7 times annually from Black Sea.

● **Surface water samples are analyzed for POPs pesticides residues only in case of warning for any pollution or accidents.**

MINISTRY OF AGRICULTURE AND FORESTRY, National Plant Protection Servise

● Pesticide residues and heavy metals and nitrates content in irrigation water

Pesticide residues and heavy metals and nitrates content in irrigation waters are monitored. NPPS controls regularly or in case of warning for any pollution of irrigation waters or pesticides, including POPs.

MINISTRY OF TRANSPORT AND COMMUNICATIONS, **Executive Agency Marine Administration**

Environmental monitoring on bulgarian blacksea coast

Database includes:

- Total amount of individual polyaromatic carbons and **chlorine content pesticides in sediments and in sea water.**

● Environmental monitoring on Bulgarian blacksea coast 1999/2000

Database includes:

- Total amount of individual polyaromatic carbons and **chlorine content pesticides in sea water and in sediments by coastal and marine stations**

2.3.8.1.3. Soils

MINISTRY OF ENVIRONMENT AND WATER, Executive Environment Agency

● National Automated System for Ecological Monitoring /NASEM/, Subsystem „Lands and soils", Funtional subsystem „Earth bowels protection", Waste

Since January 2004 a new system for soil monitoring ia approved and introduce by MoEW. Level II consists of National sampling points net for monitoring of regional pollution including industrial pollution, soil oxidation and salinification, land critical loading and soil erosion.

The National Nets for Control and Industrial Soil Pollution Prevention register:

- Soil pollution with POPs from 20 sampling points; measured parameters: 16 polyaromatic hydrocarbons and **6 PCBs congeners**.

● National Automated System for Ecological Monitoring /NASEM/, Subsystem „Lands and soils", Funtional subsystem" Control and soils pollution protection with persistent organic pollutants - pesticides"

The database includes measured residues of organochlorine, phosphorus organic and triazine pesticides in soils. The sampling is performed in regions by 15 regional inspectorates for environment and waters, samples preparation and analysis are performed in 6 basic RIEW. Organization,coordination,quality control and assessment are performed by EEA/Sofia. Measurement technique: ISO /CD 10382.2 Measured indicators:

- ***organochlorine pesticides: DDT,heptachlorine,endrine,eldrine,dieldrine****, methoxichlorine,* cis-*heptachloroepoxyde, hexachlorocyclohexane isomers;*
- organophosphorus pesticides-zolone,phenitrotion;
- and triazine pesticides-atrazine, simazine, propazine.

● National Automated System for Ecological Monitoring /NASEM/, Subsystem „Lands and soils", Funtional subsystem" Control and soils pollution protection with persistent organic pollutants - pesticides" - storages and plant protection products, stored in them

Since January 2004 a new system for soil monitoring ia approved and introduce by MoEW. Level III monitors and registers the local soil contamination, including the control and soil protection from mining industry activities and storehouse status and the amounts of obsolete and banned pesticides stockpiles.

Using information cards, including 10 indirect indicators the RIEW collect every year data about obsolete pesticides stockpiless (storehouse status ,owner, localit) and pesticides , stored in them (amount, liquid and solid state, known and unknown type). Data obtained are as a result of expert assessment based on site visits with participation of MOEW's, Civil Protection Agency and MoAF representatives. discusses and takes decisions on all activities regarding the facilities for storage of prohibited and obsolete pesticides. The collected information is submited to EEA for summarizing and analysis by statistical methods, being a base for assessment of local soil contamination.

The established database shall be included in special Register for local soil pollution and contaminated sites, which are localized by settlements on the land of which the obsolete pesticides storage is located.

● National Automated System for Ecological Monitoring /NASEM/, Subsystem „Lands and soils", Funtional subsystem „Control and and soils pollution protection with persistent organic pollutants - PAH and PCB"

The database includes measured background concentration of heavy metals in soils from 20 points for monitoring and control, selected in accordance with pollution source : point (industrial), linear (road transport) and reference background. The information is collected by RIEWs, settlements, municipalities, districts and for the whole country. Measurement technique: ISO /CD 10382.2.

Measured indicators:

- PAH – 16 compounds in accordance with European classification;
- **PCBs – 6 congeners in accordance with European classification;**

Sampling is performed by 15 RIEWs and analysis – 4 RIEWs. Organization,coordination,quality control and assessment are performed by EEA/Sofia

MINISTRY OF AGRICULTURE AND FORESTRY, National Plant Protection Servise (NPPS)

● Pesticide residues and heavy metals and nitrates content in soil

Together with its regional structures and laboratories NPPS controls regularly or in case of warning for any pollution of soils, irrigation waters or plant products regarding the above mentioned pollutants.

● Pesticide residues and heavy metals and nitrates content in row materials and products of plant origin

NPPS together with its regional units and laboratories controls regularly or in case of warning for any pollution of plant products and row materials with pesticides residues, heavy metals and nitrates.

2.3.8.1.4.Foods of animal origin

MINISTRY OF AGRICULTURE AND FORESTRY, National Veterinary Medical Service (NVMS)

● National Monitoring Program for Control on Residues (NMPCR), including POPs in live animals and animal products intendet for human consumption.

The National Monitoring Program for Control on Residues (NMPCR) in live animals and animal product includes:?

- live animals and fresh meat – cattle, horses, sheep, lambs, goats, kids and pigs;
- poultry – ducks, goose and hens;
- eggs - hen eggs and quail eggs;
- fish - carp, silver carp, hausen, trout, pike and perch;
- milk - sheep and cow milk;
- game - deer and pheasants;
- farmed game – pheasants and rabbits;
- bee honey.

Individual samples are tested for Residues of antibacterial substances, phosphorus organic or organochlorine compounds - organic substances, including such as PCBs, chemical elements, mycotoxines or radionuclides in Life animals and animal products - red meat; poultry; hen eggs; raw milk; fish; bee honey; farmed and wild game. NVMS publishes annual report on residues detected.

2.3.9. CURRENT LEVEL OF INFORMATION, AWARENESS AND EDUCATION AMONG TARGET GROUPS; EXISTING SYSTEMS TO COMMUNICATE SUCH INFORMATION TO THE VARIOUS GROUPS; MECHANISM FOR INFORMATION EXCHANGE WITH OTHER PARTIES TO THE CONVENTION

The efforts to guarantee the environmental protection and sustainable development in Bulgaria require public awareness raising.

2.3.9.1. State of knowledge among governmental stakeholders

The experts and specialists involved in management and control of chemicals in relevant agencies are highly qualified and experienced, with specific knowledge in their field (chemistry, medicine, pharmaceuticals, economy, mathematics, physics, biology, machine engineering, metallurgy, agro-chemistry, agronomy and ecologists); they are aware of the national and international legislation, and of the global practices in their field, are computer literate and know one or more language (English, German, French, Russian).

Table 61 presents data about the administrative capacity available in ministries and government agencies whose activities involve management of chemicals: MOEW; MH; MAF; MLSP; ME; MTC; NIS; State Agency „Civil Protection".

Table 61 Available resources at ministries and governmental agencies

Ministry/agency	Available experts number	Available experts type
MOEW;	2	Managers
Headquarters	1	State experts
	3	Chief experts
	4	Senior experts
	5	Junior experts
RIEW – 15	30	Experts
MAF and NPPS – headquarters	7	Experts
Central control laboratory for analysis of pesticides, heavy metals and nitrates	23, of which	
	11	specialists
	12	chemists
MH		
Headquarters	8	Experts
IHE – 28	57	Experts
NCHMEN	15	Toxicologists
	36	chemists
	12	specialists

Ministry/agency	Available experts number	Available experts type
Clinics and clinical toxicology	42	Experts
departments in Sofia and in larger towns	20	specialists
Occupational disease clinic	3	Experts
	1	specialists
MLSP		
Chief labour inspectorate	5	Inspectors
Regional labour inspectorates	32	Inspectors
ME	2	Experts
Civil Defence State Agency	2	Managers
Regional Civil Protection Directorates	5	Experts
	30	Experts
NIS	12	Experts
		Chief experts

Note: The number of experts in management of chemicals is for December 2004, with some experts being entrusted with other responsible, as specified in their job descriptions.

2.3.9.2. State of knowledge among target groups

The training programmes aimed to provide technical competence to assess potential risks in the production, use, import, export of chemicals, and the disposal of their waste are mainly used in university-grade education. These are: the University of Chemical Technology and Metallurgy in Sofia, the Asen Zlatarov University in Burgas, the Chemical Department of the Sofia University „Kliment Ohridski", Medical Universities. These are mostly master degree or post-graduate education programmes.

In order to increase the competence of specialists for environment protection, many universities teach the subject of Ecology and Environment Protection: University of Chemical Technology and Metallurgy of Sofia, the Mining and Geology University of Ivan of Rila in Sofia, the Forestry University of Sofia, the Sofia University „Kliment Ohridski", the Thracian University in Stara Zagora, the Technical University in Sofia, the Technical University in Varna, the South-West University of Neophit of Rila in Blagoevgrad, the Plovdiv University, etc.

2.3.9.3.Public state of knowledge

According to a national representative sociological survey, more than half of the citizens are interested in environmental issues and state that they receive sufficient information. The other half claims that the information they receive is insufficient but this is caused by lack of interest (27%), lack of persons responsible to this information (8%), lack of such information (7%). The most preferred form of receiving of environmental information by the citizens is the national television stations, followed by central and local newspapers, and the information materials distributed to their homes and on public displays.

2.3.9.4. Public awareness

Following the adoption of the NESAP for 2000-2006, the MOEW started a number of important steps for further provision of environmental information to the public. The MoEW, in cooperation with the NIS, has developed progress monitoring indicators, which can be traced from NIS studies. The results will guide the national policy for provision of information to the public for environmental decision making.

The collection, processing and distribution of environmental information from the National Environmental Monitoring System (NEMS) are extremely important for the scope, the form and the understanding of the information for the public. A range of problems and weaknesses were analysed in the period 2000-2004 and measures for development of the system were envisioned.

In addition, the annual public reports have been prepared in a way that helps better understanding of environment-related events in Bulgaria.

The „minimum 5% annual increase in registered knowledge on issues of the environment and sustainable development" will be achieved by means of the following planned activities:

- Drawing up of a programme for rising of the public awareness on issues of environment and sustainable development.
- Implementation of the programme.
- Carrying out of sociological studies for progress monitoring.

2.3.9.5. Workshops for training of experts and public awareness raising

- GEF POPs 12 Pilot Countries' NIPs Project – Bulgaria -Sub-project kick-off meetings and Technical Workshop for the Preparation of NIPs for POPs Management with participation of UNEP and UNITAR experts, December 8 to 15, 2002, Sofia.
- 8th International HCH and Obsolete Pesticides Forum", organized by MoEW, Bulgaria and IHPA, Denmark, 26-28 May 2005, Sofia.
- Conference of the Parties of the Stockholm Convention on Persistent Organic Pollutants, COP1, Punta del Este, Uruguay, 2–6 May 2005.
- 2nd Meeting of the Steering Group - UNEP/DGEF: 12 countries pilot project for the development of National Implementation Plans (NIPs) for the management of Persistent Organic Pollutants (POPs), Geneva, 3-4 October 2005.
- Workshop „Stockholm convention on POPs", NGO „Ecoglasnost", 22 April 2005, Sofia.
- Workshop „Pesticides impacts in the Danube and Black sea region", IPEN, 13-15 May 2005, Varna, Bulgaria
- Regional Workshop for CEECA countries on Lessons learnt and Good practice on NIPs development under Stockholm convention, UNEP Chemicals, 15-17 February 2006, Sofia.

Conclusions:

The data about administrative capacity and financial resources submitted by these represented state institutions lead to the conclusion that most ministries have the necessary capacity to implement the new legislation on chemicals and POPs.. An additional number of experts should be envisioned for the MoH and for the Civil Protection State Agency and their branches throughout Bulgaria.

The chemical-substance management training programmes offered in the Bulgarian universities at present provide very good technical competence that is required for the implementation of environmental conservation management programmes. To increase the competence of officials involved in the management of chemical substances and POPs , short-term courses and post-graduate requalification for bachelor and magistrate degree holders should be intensified.

2.3.10. RELEVANT ACTIVITIES OF NON-GOVERNMENTAL STAKEHOLDERS

With their specific structure, financing and expression, non-governmental organizations play an important role in the management of any country. Many NGOs in Bulgaria have ecological issues and environmental protection at the centre of their activities. Considering the activities and the large diversity of non-governmental structures in our country, we could arrange them in a general group, as follows:

- Industrial organizations – unions, branch chambers, economic associations, economic chambers, companies, manufacturer associations, etc.;
- Universities, study institutions, colleges, vocational schools, specialized private schools, specialized national and international training courses, re-training, scientific research institutes, scientific-research sectors, associations, foundations, laboratories, etc.;
- Non-governmental organizations – centres, clubs, movements, user associations; association of carriers, unions etc.;
- Other organizations – limited liability companies (Ltd), joint stock companies (JSC), sole proprietors (SP), private companies, associations, consulting organizations etc.

Despite the diversity of existing non-governmental structures and of the manner of their registration, the above organizations can participate through different types of activities (production, import, export, use of chemical substances, development of new chemical substances and their application) in „the life cycle" of chemical substances.

Various non-governmental organizations may aid in the efforts of governmental institutions to manage chemicals and POPs, such as: analyzing of data about chemicals and POPs; risk assessment; provision of programmes for training in management of chemicals and POPs; public awareness raising campaigns; research for ecological substitutes.

2.3.10.1. Management of hazardous waste activities

BALBOK ENGINEERING JSC

The main activities related to management of chemical substances are:

- the Method for Detoxification and Decomposition of Unusable or Obsolete Pesticides, Sofia, 2000
- BB Cube steel reinforced concrete container for transportation and storage of hazardous and radioactive waste. Chapter 2 shows such cubes and the location of their sites in Bulgaria where environmentally sound storage of obsolete or expired pesticides, some of which might contain persistent organic pollutants.
- Management of hazardous waste containing polychlorinated biphenyls and polychlori nated terphenyls – pilot implementation of an action plan in a model region (Research on national production of PCB and import/export of PCB/PCT containing devices in Bulgaria) 2001.

2.3.10.2. POPs activities management

BALKAN SCIENCE AND EDUCATION CENTRE OF ECOLOGY AND ENVIRONMENT (BSECEE)

The main activities of the centre are: education; scientific research; consulting; expertise; provision of information; designing.

The main work and projects of the BSECEE involving chemical substances, including persistent organic pollutants and their environmental impacts. Elaborates in the development of the National Action Plan for Management of Persistent Organic Pollutants in relation to the Stockholm Convention.

2.3.10.3. Publications and websites in the country

POPs issues and Stockholm convention WEB page , containing various information, text of convention ; National Profile for the management of chemicals in Bulgaria can be found on the web site of Ministry and Environment and Waters (MoEW) – www.moew.government.bg. The POPs web page shall be amended with the NIP for POPs management in Bulgaria, POPs Action plans; POPs Inventories, POPs popular brochures for the awareness raising of general population and other issues related to POPs.

Links to other international stakeholders

Official website of the Stockholm Convention: www.pops.int
Official website of the Rotterdam Convention: www.pic.int
Official website of the Bazel Convention: www.basel.int
Official website of UNEP- Chemicals: www.chem.unep.ch
Official website of WHO: www.who.ch
Official website of FAO: www.fao.org
Official website of UNIDO: www.unido.org
Official website of OECD: www.oecd.org
Official website of UNITAR: www.unitar.org
Official website of IFCS: www.who.int/ifcs/

2.3.11. OVERVIEW OF TECHNICAL INFRASTRUCTURE FOR POPS ASSESSMENT, MEASUREMENT, ANALYSIS, ALTERNATIVES AND PREVENTION MEASURES, MANAGEMENT, RESEARCH AND DEVELOPMENT – LINKAGE TO INTERNATIONAL PROGRAMMES AND PROJECTS

2.3.11.1. Laboratory Infrastucture for POPs analysis

A number of laboratories in Bulgaria may be involved in the management of chemical substances in the various stages of their life cycle. These laboratories are capable of analysing chemical quality during the manufacturing process, analysing and controlling of waste products, identifying unknown substances, studying of possible harmful effects, etc. These laboratories should be accredited according to Bulgaria's current legislation.

The accredited Laboratories for Analysis of POPs are listed in table 62.

Table 62 Accredited Laboratories for Analysis of POPs

№	Name/Location	Personnel	Laboratory equipment	Analysis of:	POPs
1	Laboratory for analysis of organic pollutants, Executive Agency Environmental Protection, Ministry of Environment and Water, Sofia Agilent	3	1 GC/MS system „Hewlett Packard 5890/5972", 1 GC/MS system „Termo Finnigan DSQ" 2 HPLC systems with DAD, FLD, UV, 1 GC/FID/ECD system	Water, sediments, soil, oils	POPs pesticides, PCB and HCB
2	Regional Laboratory, EA Environmental Protection, Ministry of Environment and Water, Russe	2	1 GC/MS system „Hewlett Packard", 1 LC system „Hewlett Packard"	Water, sediments, soil	POPs pesticides, PCB and HCB
3	Regional Laboratory, EA Environmental Protection, Ministry of Environment and Water, Plovdiv	2	1 GC/MS system „Termo Finnigan DSQ", 1 GC/MS system „Hewlett Packard", 1 GC/FID system „Perkin Elmer"	Water, sediments, soil	POPs pesticides, PCB and HCB
4	Regional Laboratory, EA Environmental Protection, Ministry of Environment and Water, Varna	1	1 GC/FID system „Perkin Elmer", 1 GC/MS system Agilent	Water, sediments, soil, oils	POPs pesticides, PCB and HCB
5	Regional Laboratory, EA Environmental Protection, Ministry of Environment and Water, Burgas	1	1 GC/MS system „Hewlett Packard", 1 GC/MS system Agilent	Water, sediments, soil	POPs pesticides, PCB and HCB
6	Chemical studies, Inspectorate of Hygiene and Epidemiology, Sofia	5	1 GC system „Perkin Elmer", 1 UV-VIS Specter Photometer „Perkin Elmer", Thin-layer Chromatography	food, water	POPs pesticides
7	Toxicology, Inspectorate of Hygiene and Epidemiology, Sofia	3	1 UV-VIS Specter Food Photometer „Lomo", Thin-layer Chromatography kit	Food	POPs pesticides
8	Laboratory Studies, Inspectorate of Hygiene and Epidemiology, Razgrad	3	VIS Specter Photometer	Food	POPs pesticides
9	Toxicology of food, Inspectorate of Hygiene and Epidemiology, Varna	3	1 GC system „Perkin Elmer", Thin-layer Chromatography kit	Food, water	POPs pesticides
10	Laboratory Studies, Inspectorate of Hygiene and Epidemiology, Burgas	5	1 GC system „Perkin Elmer", Thin-layer Chromatography kit	Food, water	POPs pesticides
11	Laboratory Studies, Inspectorate of Hygiene and Epidemiology, Pleven	5	1 GC system „Perkin Elmer", Thin-layer Chromatography kit	Food, water	POPs pesticides

№	Name/Location	Personnel	Laboratory equipment	Analysis of:	POPs
12	Laboratory Studies, Inspectorate of Hygiene and Epidemiology, Plovdiv	5	1 GC system „Perkin Elmer", Thin-layer Chromatography kit	Food, water	POPs pesticides
13	Laboratory Studies, Inspectorate of Hygiene and Epidemiology, Stara Zagora	4	Thin-layer Chromatography kit	Food, water	POPs pesticides
14	Central Laboratory for Monitoring of Pesticides, Nitrates, and Heavy Metals. National Plant Protection Service, Sofia	10	3 GC systems 2 GC/MS system 1 LC system, 2 HPLC, 1 UV-VIS Specter Photometer	Plant products, soil, sediments	POPs pesticides, PCB and HCB
14	Chemistry of Food, National Centre for Hygiene, Medical Ecology, and Nutrition, Sofia	24	2 GC systems, 1 HPLC, 1 UV-VIS Specter Photometer	Food	POPs pesticides, PCB and HCB
15	Environmental Chemistry, National Centre for Hygiene, Medical Ecology, and Nutrition, Sofia	35	2 GC systems, 1 GC/MS system 1 HPLC system, IR Specter Photometer, UV-VIS Specter Photometer	Soil, water, air	POPs pesticides, PCB and HCB

***Note**: The EABAS has accreditated under the Bulgarian State Standard EN ISO/IEC 17025:2001, BSS EN 45000 and ISO/IEC 17000 a number of laboratories working in the field of persistent organic pollutants.*

- No laboratory infrastructure for PCDDs/PCDFs in air, water, soil and food exists in Bulgaria.
- There is only two accredited Laboratories for analysis of PCBs in oils.
- Laboratory capacity for PCBs and HCB is insufficient.

2.3.11.2. National CORINAIR-94 Methodology for POPs emissions estimation

The emissions are calculated in relation with National CORINAIR - 94 methodology for Determination of the Emissions of Harmful Substances in Air, adapting the emission inventory Guide - CORINAIR-94, SNAP-94 for the Bulgarian conditions, taking into account the national specificities concerning the respective activity, technologies and equipment.

The CORINAIR-94, SNAP-94 manual puts the pollutants into three levels. POPs belong to the third group – persistent organic pollutants.

This methodology is used for inventorying and for balance determination of the emissions of harmful substances into the air.

Definition of items in CORINAIR 94 methodology (emission sources)

1. Combustion processes in energy generation and transformation (stationary sources)
2. Combustion processes in trading, administrative and household sectors, in agriculture, in agriculture, forestry and fishing (stationary sources)
3. Industrial combustion processes (stationary sources)

4. Industrial processes (stationary sources)
5. Extraction and distribution of fossil fuels
6. Use of solvents
7. Road transport
8. Other motor vehicles and machines
9. Waste treatment and disposal
10. Agriculture, forestry and and changes in land-use
11. Nature

Emission factors

The emissions of air pollutants are calculated based on the activity data and emission factors, which are set in CORINAIR 94 methodology. The CORINAIR-94, SNAP-94 and the Methodology are using the matrix approach. The rows in the matrix cover the sources of emissions. These are the activities (anthropogenic and natural) that generate emissions of the respective pollutants. The columns of the matrix involve the pollutants of air, i.e.the emitted harmful substances.

Their emissions are calculated using the formula:

E = EF. Q

where

E – emission in a certain quantity

EF – emission factor – a factor, a relative measure – emission related to a quantitative unit that defines adequately the specific activity.

Q – Quantitative charactiristic

Depending on the type of the activity, the quantitative characteristic may be: used raw materials, fuel, energy or manufactured produce. The emission factor reflects the correlation of quantity emissions of POPs from used raw materials; the process type; the level of used technology; the availability and type of treatment facilities;

The emissions of following Persistent organic pollutants in the air are estimated by the National CORINAIR 94 Methodology: hexachlorobenzene /HCB/, hexachlorocyclohexane /HCH/, polychlorinated biphenyls /PCBs/, dioxins/furans /DIOX/, polycyclic aromatic hydrocarbons (PAH), pentachlorophenol /PCP/;

Future improvement in National methodology

In order to improve the national emission inventory under the Convention on Long-Range Transboundary Air Pollution and to eliminate all methodological and data gaps in existing CORINAIR-94 inventory, at the moment MEW/EEA is in process of Updating of National Emission Inventory Methodology.

The new methodology will be developed by adapting the Third edition of the EMEP/CORINAIR Atmospheric Emission Inventory Guidebook for the Bulgarian conditions, taking into account the national specificities concerning the respective activity, technologies and equipment.

2.3.11.3. References

There are a lot of publications , research reports and scientific studies within the field of POPs in Rbulraria, which could be found in the full version of Bulgarian NIP for POPs on the MoEWs web page.

2.3.10.4. Participation in international projects and programmes

1. MoEW, „Destruction of Risk Pesticides from Bulgaria in the Netherlands", July 2000.

2. MoEW , Twinning project BG99IBEN01a „ Management of Waste, containing PCBs"- part I.
3. MoEW, Twinning project BG99IBEN01a Management of Waste, containing PCBs"- part II.
4. MoH, PHARE project „ Danube Pesticide Regional Study", 1995-1997.
5. MoH, Project „Environmental pollution with organochlorine pesticides by small-scale incidents" 1993 – 2000.

2.3.12. IDENTIFICATION OF IMPACTED POPULATIONS OR ENVIRONMENTS, ESTIMATED SCALE ANDMAGNITUDE OF THREATS TO PUBLIC HEALTH AND ENVIRONMENTAL QUALITY AND SOCIAL IMPLICATIONS FOR WORKERS AND LOCAL COMMUNITIES

- There are not sufficient data to perform adequate assessment of POPs effects on human health and the environment.
- Potential sources of human health risks have been identified in in the country - storages for obsolete pesticides and the surrounding areas, PCBs equipment sites as well as „hot spots" of potentially large formation of POPs releases (large industrial plants and electric power stations).
- There is a necessity for carrying out more POPs analysis of environmental media and investigations of target groups of population to identify and assess correctly the POPs impacts.

2.3.13. DETALS OF ANY RELEVANT SYSTEM FOR THE ASSESSMENT AND LISTING OF NEW CHEMICALS

2.3.13.1. Notification of new chemicals - ELINCS

This online ELINCS Information System provides , through the European List of Notified Chemical Substances (ELINCS), to find general information concerning a chemical substance like ELINCS number, Trade Name or Substance Name. This current ELINCS contains 3 827 chemical substances.

2.3.13.2. European Inventory of Existing Commercial chemical Substances (EINECS)

The online EINECS Information System enables to find, through the European Inventory of Existing Commercial chemical Substances (EINECS), general information concerning a chemical substance like CAS number, EINECS number, Substance Name and Chemical Formula. This current EINECS contains 100 204 chemical substances.

2.3.13.3. New system for Registration, Evaluation and Authorisation of Chemicals (REACH)

REACH aims to improve the protection of human health and the environment while maintaining the competitiveness and enhancing the innovative capability of the EU chemicals industry. Under REACH enterprises that manufacture or import more than one tonne of a chemical substance per year would be required to register it in a central database. REACH would furthermore give greater responsibility to industry to manage the risks from chemicals and to provide users in the supply chain with safety information on the substances.

2.3.13.4.System for Major Accident Prevention and Control, involving dangerous substances – Seveso I and Seveso II

A list of potential Seveso enterprises has been elaborated in 2001. It includes information about the number, type and locations of future enterprises witt Lower Tier or Upper Tier in regard with Seveso Directive. The list indicates that in Bulgaria exist 67 enterprises from chemical industry, Oil refineries, metallurgy, electric power plants, mining, pharmaceutical industry, old depots for pesticides), which are subject of control under Seveso Regulation. Out of these 67 enterprises, 35 are classifies as Upper Tier \large industrial enterprises and storage areas and 32 – Lower Tier (smaller industrial enterprises, storage facilities for combustible chemicals, pesticides warehouses). From the Seveso reports assessment under this Convention chemicals posing biggest risk for the human health and the environment may be determined.

2.3.13.5. Business initiative : „Responsible care" and „Stuardship products"

„Responsible care" **is a voluntary initiative, developed and adopted by the Chemical industry Associations aimimg to improve the measures on human health prevention, safity of work and the environment within their production activities as well as for public awareness raising on these issues.**

3. STRATEGY AND ACTION PLAN ELEMENTS OF THE NATIONAL IMPLEMENTATION PLAN

3.1 POLICY STATEMENT

As a country tratified the Stockholm convention in force for RBulgaria from 20 March 2005 and recognizing the threats posed by the adverse effects to human health and environment, caused by persistent organic pollutants (POPs) and conscious of the need for global action on persistent organic pollutants, the Republic of Bulgaria undertakes commitments to take necessary measures and activities to:

- reduce or eliminate releases from intentional production and use, including to prohibit its production, use, import and export (POPs, included in Annex A and B);
- reduce or eliminate releases from unintentional production (POPs included in Annex C)
- reduce or eliminate releases from stockpiles and wastes (Annex A, B or C).
- establish of POPs registrers;
- participate in the international information exchange regarding POPs;
- report on the implementation of the Convention.

In implementing its obligation to develop an Action plan within 2 years of the date of entry of Stockholm convention for RBulgaria (i.e. 2007), the country has already developed National Implementation plan for management of POPs under GEF project GF/2732-02-4454.

3.1.1. Project activities

The project activities follow the step-wise process set out in the GEF „Initial Guidelines for Enabling Activities for the Stockholm Convention on Persistent Organic Pollutants" and the „UNEP-World Bank Guidance Document on the development of National Implementation Plans". In summary, these are:

(a) Determination of coordinating mechanisms and organization of process, public awareness-raising on POPs and other related hazardous substances;

(b) Establishment of POPs inventory and assessment of national infrastructure and capacity;

(c) Setting of national priorities and determination of objectives for POPs management;

(d) Formulation of a national Implementation Plan and specific Action Plans on POPs; and

(e) Endorsement of the National Implementation Plan by Stakeholders

3.1.2. Action Plan elements

The action plan elements of NIP includes the following:

1. An Evaluation of POPs issue in the country:

- An Assessment with respect to Annex A, part I chemicals POPs pesticides: historical, current and future production, use, import and export; summary of available monitoring data (environment, food, humans) and health impact
- An Assessment with respect to Annex A, part II chemicals (PCBs);
- An Assessment with respect to Annex B chemicals (DDT);
- An assessment of current and future releases from unintentional production of Annex C chemicals (PCCD/PCDF, HCB and PCBs), including the development and maintenance of source inventories and release estimates, taking into consideration the source categories identified in Annex C;
- An Assessment on the state of knowledge of stockpiles consisting of or containing POPs listed either in Annex A or Annex B; and waste consisting of , containing or contaminated with POPs listed in Annex A, B or C;
- Steps to promote handling, collection, transport, storage and disposal in an environmentally sound manner of wastes consisting of , containing or contaminated with POPs listed in Annex A, B or C;
- An identification of sites contaminated by chemicals listed in Annex A, B or C;

2. An evaluation of the efficacy of the existing regulatory framework and policies of the R Bulgaria relating to the management of POPs;

3. Existing programmes for monitoring releases and environmental and human health impacts;

4. Strategies to meet the county's obligations, taking into account the evaluations;

5. Development of Specific Action plans for each POPs, included in Annex A, B and C;

6. Steps to promote education and training with regard to, and awareness of those strategies;

7. A review every five years of those strategies and of their success in meeting the country,s obligations under Stockholm convention;

8. A schedule for implementation of the action plan, including for the strategies and measures identified therein.

3.1.3. NIP outcomes

NIP expected outcomes are:

1. Assessment of national capacity to implement the Stockholm Convention;

2. Preliminary inventories of POPs;

3. National Implementation Plan, including ranked and costed Action Plans and strategies required to meet Convention obligations;

4. Strengthened POPs management infrastructure and raised public awareness on POPs; and
5. Capacity to meet reporting obligations under the Stockholm Convention.

3.1.4. Institutional arrangement, Participants and Stakeholders

The Ministry of Environment and Water is the Implementing Agency for the development of NIP in collaboration with a Steering committee comprising of representatives of the Ministries of Health; Agriculture and Forestry; Foreign Affairs; Economy; Transport and Communications; Labour and Social Policy; and Finance; the State Agencies for Civil Defence, and Environment; the National Centre for Hygiene, Medical Ecology and Nutrition; National Plant Protection Service; National Veterinary and Medical Service; Bulgarian Academy of Sciences; Bulgarian Chamber of Commerce, Bulgarian Chamber of the Chemical Industry; University of Chemical Technology and Metallurgy – Sofia; Forestry University, Sofia; and the NGOs „Ecotech Consult"; „For the Earth".

3.2. IMPLEMENTATION STRATEGY

To meet its obligation under Stockholm convention each Party:

(a) Develops and endeavours to implement a plan for the implementation of its obligations under this Convention;

(b) Transmits its implementation plan to the Conference of the Parties within two years of the date on which this Convention enters into force for it; and

(c) Reviews and updates, as appropriate, its implementation plan on a periodic basis and in a manner to be specified by a decision of the Conference of the Parties.

3.2.1. Guiding Principles of the Implementation Strategy

The implementation strategy of NIP for POPs is based on the following principles:

- Adherence of Stockholm convention provisions;
- Adherence to EU directives provisions;
- Adherence to „the polluter-pays" principle;
- Adherence to and enforcement of international standards;
- Integration within overall environmental management and sustainable development policies;
- Transparency in information sharing and exchange on POPs issues;
- Provision to the public of available information on POPs and training of professionals on the implementation of measures and activities, included in the NIP for POPs;
- Public and stakeholder participation and transparency of the decision making process regarding POPs issues;

3.2.2. SWOT – Analysis on the possibilities to meet the provisions of Stockholm convention in R Bulgaria

SWOT-Analysis (Strengths, Wealnesses, Opportunities and Threats analysis) is of key importance for the strategic planning process. It helps to proritise the results of the environmental scan analysis and to structure them in such a way as to allow for the setting of the strategic goals and specific objectives of the Republic of Bulgaria to be pursued in the coming years.

The SWOT analysis has been implemented based on the results obtained to date.The analysis showed that R Bulgaria has good institutional, professional and scientific capacity to meet its obligations under Stockholm convention.

SWOT- ANALYSIS
on the possibilities to meet the provisions of Stockholm convention in R Bulgaria

STRENGTHS

- No POPs production and import;
- Ban for production, import and use of POPs pesticides;
- Good Laboratory infrastructure for analysis of POPs pesticides and PCBs in air, water, soils and food;
- Competent administrative, technical and research staff;
- Well developed system for monitoring of POPs pesticides in the environment;
- Low level of air, water and soil POPs pollution of the territory of the country;
- Developed National Implementation Plan for management of POPs;
- Adopted legislation, harmonized with environment *acquis communitare* in respect to provisions of Stockholm convention;
- Sufficiently developed institutional system on national level for enforcement of environmental legal framework for management of POPs;

WEAKNESSES

- Shortage of national funding for investment in the field of management of POPs;
- Lack of financial resources for research, monitoring, laboratory infrastructure and detailed POPs inventory;
- Lack of sufficient administrative capacity on municipal level for the enforcement of legislation in respect to POPs, listed in Stockholm convention;
- Lack of trained specialists and managerial personnel for POPs management in the industrial, energy and agriculture sectors;
- Lack of Labs and trained personnel for control and analysis of Dioxins and Furans;
- Insufficient laboratory infrastructure and trained personnel for control and analysis of PCBs in air, water, soil, food, oils and waste
- Incomplete date on the composition of obsolete and out-of-use pesticides in storages;
- Insufficient information about the number and distribution of electrical equipment, containing PCBs ;
- Lack of data for the impacts of PCBs and Dioxins/Furans on human health;
- Lack of integrated monitoring on POPs levels (PCBs and D/Fs) in humans and the environment;
- Incomplete data on food contamination with POPs;
- In some „hot spots" urban places there are still unsolved problems with regard to POPs po;;ution of ambient air;
- Unsolved problems with regard to wastes, containing and/or contaminated with POPs;
- Uncontrolled burning of wastes in households and stublefields;
- Low awareness of the general public about the hazards of POPs;
- Lack of information brochures/leaflets and insufficient dissemination of education and publicly accessible awareness materials concerning the impact of POPs on human health and on the environment.
- Lack of of decontamination and disposal oils facilities;
- Lack of POPs pesticides disposal facility.

SWOT- ANALYSIS
on the possibilities to meet the provisions of Stockholm convention in R Bulgaria

OPPORTUNITIES

- Use of EU, GEF and World bank financial toolls for dolving problems related to management of POPs;
- Conformity of national priorities in the management of POPs with priorities of international bodies – UN, FAO, EU, WHO, etc.
- Political will of the Government to make efforts to solve the POPs issue;
- Intellectual capacity;
- Institutional framework for information and public participation in decision taking with regard to environmentq including POPs issues;
- Active NGOs;

THREATS

- Risk of exposure to PCBs and D/Fs for humans and the environment;
- Air Pollution resulted from forests fires, uncontrolled burning of wastes in householdsand and stuble-fields;
- Potential for air pollution with Dioxin/Furans from large stationary point sources in energy sector;
- Potential for air pollution from the intensive transport traffic and the extremely adverse age structure of the motor vehicles;
- Lack of financial resources from dtate budget for inventory and POPs elimination activities;
- Limited financial and human resources for POPs management on regional and municipal level;

3.2.3. Strategic goal and national objectives of NIP for POPs (Objectives tree)

Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the main strategic objective of Stockholm Convention is to protect human health and the environment from persistent organic pollutants.

Based on the SWOT analysis, the major objectives for the future development of the country in the field of management of persistent organic pollutants (POPs). In setting up the strategic goal and specific objectives, the strengths to be preserved; the weaknesses to be solved and the threats, posed by POPs had been taken into consideration. In order to solve this issue the approach was chosen to allow to the maximum extent possible the use of the strengths and the opportunities im the country.

Formulated goal and specific objectives express strategic choice and the main priorities of R Bulgaria for the next several years.

Strategic goal and specific objectives are presented as a major long-term strategy and specific national objectives in medium-term and short-term, the country is facing out (*Objectives tree*).

The longterm strategic goal of National Implementation Plan for management of POPs in RBulgaria is:

Protection of human health and the environment from harmful impact of Persistent Organic Pollutants based on the environmental policy for sustainable development.

The identification of national strategic objectives for the future management of POPs in the Republic of Bulgaria has been implemented on the grounds of SWOT analysis of existing problems and difficulties, the national peculiarities as well as taking into account the provisions for comformity with EU asquis and Stockholm convention.

The National implementation plan for management of POPs formulates the following **8 major national objectives** addressed to:

1. Development and Strengthening of Insititional and Administrative Capacity Building on national, regional and municipal level;

2. Elimination of intentional production and use of POPs;
3. Minimization or prevention releases from unintentional production of POPs (Dioxin/Furans, HCB and PCBs) or source elimination;
4. Reduce or eliminate obsolete pesticides stockpiles, containing and/or contaminated with POPs;
5. Develop and endeavour to apply Action plans for implementation of measures, envisaged in the NIP;
6. Encourage and promote research, development and monitoring pertaining to POPs including on their:
   - presence and levels in humans and the environment;
   - effects on human health and the environment.
7. Public awareness raising with regard to POPs;
8. Attract investments and encourage activities with regard to POPs management.

3.2.4. Criteria for priority setting

The following steps have been identified in the process of priority setting:

- Defining the methodology;
- Selecting the ranking criteria;
- Creating the priority list and verifying it;
- Transferring priority areas to the NIP objectives.

The following **Criteria for National priority settings** was adopted:
1. Efficacy and efficiency of possible measures for control and risk reduction for human health and the environment;
2. Technical feasibility, availability and accessibility of alternative products and technologies;
3. Economic aspects, including financial capabilities and costs of implementing possible control measures;
4. Waste and disposal implications (in particular stockpiles of obsolete pesticides and clean-up of contaminated sites);
5. Status of control and monitoring capacity;
6. Access to information and public education]
7. Time - Frame Schedule for implementation;
8. Integration in the existing legislation

3.2.5. Identified Priorities of National significance

The use of above criteria enabled an in-depth analysis, taking into account all significant factors with regard to the provisions of Stockholm convention, the situation in Bulgaria as well as ongoing activities related to POPs management. The significance of priorities and objectives has been ranked under the following coefficients:

- High Priority Area (H);
- Moderate Priority Area(M);

Low Priority Area(L).

All above provided a ranking list of major priorities of national significance for POPs management on the basis of total scores obtained for problems assessed in a view of different criteria.

During the NIP development process, the following **10 priorities of national significance** among POPs categories were defined, based on ranking of POPs issues importance:

1. Development and enforcement of plan for environmentally sound management stockpiles and wastes in order to reduce/eliminate obsolete pesticides, containing/contaminated with POPs;
2. Development of plan for identifying and remediation of contaminated sites.
3. Development of strategy for identification, marking and step-by-step phase-out of use of PCBs operating equipment;
4. Development of an action plan for safe storage and environmentally sound disposal of equipment and oils, containing PCBs;
5. Development an action plan for reduction/elimination of releases from unintentional production (D/Fs, HCB and PCBs);
6. Evaluation of negative POPs impacts on human health and monitoring of POPs levels in humans and the environment;
7. Encourage and support research on POPs effect on humans and the environment;
8. Promote and facilitate public awareness raising with regard to POPs;
9. Endeavour to secure financial resources for implementation NIP measures by attracting investments from international finance institutions and donors.
10. NIP integration in the existing National Environmental and Sectoral policies;

3.3. ACTIVITIES, STRATEGIES AND ACTION PLANS

The specific action plans deal with the requirements for Parties of the Stockholm Convention in the following four major areas:

- intentional production and use of POPs (Articles 3 and 4, Annexes A and B).
- unintentional production of POPs (Article 5 and Annex c, Parts I, II and III)
- stockpiles and wastes (Article 6)
- measures related to information exchange (Article 9), public information, awareness and education (Article 10), research, development and monitoring (Article 11) and reporting (Article 15).

Bulgaria has undertaken a lot of activities related to the arrangements under the Convention, such as introduction of the general public with the problems caused by POPs; institutional capacity building; development of a National Implementation Plan for POPs Management.

The implementation of the Bulgarian environmental legislation that is harmonized with the EU one, the National Implementation Plan for POPs Management and the enforcement of other mechanisms (such as strategies, plans, projects, etc.) shall impose the convention requirements in practice. The Convention obliges its Parties to pursue policy and undertake measures to eliminate the production and usages and to prohibit import and export of the POPs or to reduce or eliminate their unintentional production and distribution.

Given the fact the inventory of POPs pesticides in Bulgaria has not registered any production, use, import or export of chemicals, listed in Annexes A and B, excluding PCBs use in close systems, it can be concluded that the list of country obligation arising from Articles 3 of the Convention have already been fulfilled.

The part common to all POPs and which refers to unintentional production of POPs, to identification of contaminated sites, stockpiles and wastes and use of PCBs in equipment is stated in the strategies and specific action plans.

Table 63 gives the list of commitments arising from the Convention with regard to POPs and current status of implementation in R Bulgaria.

Table 63 Current status of Bulgarian obligations' implementation under the provisions of Stockholm Convention

Commitment	Annexes	Current status
Article 3.1		
a) i	Annex A, Part I	There is no production or use of POPs pesticides and no PCBs production
	Annex A, Part I	PCBs use in close systems permited
	Annex A, Part II	PCBs equipment use such as transformers and capacitors
	(a) i	10% PCBs >5 liters permitted for use till 2010
	(a) ii	0,05% PCBs >5 liters permitted for use till 2010
	(a) iii	0,005% PCBs > 0,05 liters allowed for use till 2025
	(c)	Export and import is prohibited
	(d)	Not allowed recovery for re-use in other equipment
	(e)	Shall endeavour and undertake measures for environmentally sound waste disposal of equipment and liquids, containing >0,05% PCBs till 2010 equipment and liquids, containing upto 0,005% PCBs not later than 2028
a) ii	Annex A, Part I	There is no export or import of POPs
b)	Annex B	Production and use of DDT is prohibited
Article 3.2		
a) i	Annex A & B	Import for disposal is prohibited
a) ii	Annex A & B	Import for POPs use is prohibited
b) i	Annex A & B	No exceptions for POPs disposal
b) ii	Annex A & B	No exceptions for POPs use
3.5		There are provisions about the use of chemicals for laboratory purposes
Article 5		
(a)	Annex C	An action plan is developed
(b)	Annex C	Regulatory measures for IPPC are undertaken
(d)	Annex C	BAT application is legally regulated for existing and new installations
Article 6		
1.a) i	Annex A and B	A strategy for identification of stockpiles of POPs pesticides is not developed.
1 a) ii	Annex A,B or C	There is no POPs pesticide in use.
b)	Annex A or B	Preliminary Inventories has been completed. Need for detailed physical inventories.
c)	Annex A and B	Stockpiles of POPs pesticides have not been physically identified due to torn packages and lack of labels. Need for additional site analysis.
d) i	Annex A or B	Handling, collection, transportation and storage of hazardous wastes is legally regulated.
d) ii	Annex A or B	No facility for environmentdlly sound POPs disposal.
d) iii	Annex A or B	Not permitted for re-use after disposal.
d) iv	Annex A or B	Provisions has been taken to comply with the Basel Convention and regulations on transport of hazardous substances
e)	Annex A,B or C	No strategy for identifying of contaminated sites. Remediation of demolished obsolete pesticides storage sites has been carried out.

Article 9		As signatory of SC, Bulgaria has undertaken obligations to participate in the international information exchange regarding POPs;
Article 10		
1 (a), (b)	Annex A,B or C	Web-site on hazardous chemicals, including info on POPs is prepared
1(d)	Annex A,B or C	Active participation of NGO, addressing POPs
1(f)	Annex A,B or C	POPs brochures and leaflets has been developed.
2.	Annex A,B or C	National Profile for management of chemicals, including POPs is put on MoEW Web-site for access to the public.
4.	Annex A,B or C	POPs safety data sheets has been developed. Information centres on national and regional level has been established. All information addressing POPs is available at Info centres.
Article 15		
1.		As signatory of SC, Bulgaria has undertaken commitmets on Reporting on the implementation of the Convention.
2.		Annually maintained POPs pedticides data base . PCBs and POPs release category sources date bases shall be developed.

To achieve the main national objectives, three specific Action plans for each POPs were developed:

1. Action plan for POPs - Pesticides
2. Action plan for PCBs in Equipment
3. Action plan for POPs releases from unintentional production (D/Fs, PCBs and HCB).

Within the process of formulation and development of specific Action plans for each POPs category the strengths and opportunities of Bulgaria to meet its obligations under Stockholm convention have been considered. The measures and activities to be taken recognize the current status of POPs issue in Bulgaria

- No POPs production and import;
- Ban for production, import and use of POPs pesticides;
- Relatively good Laboratory infrastructure for analysis of POPs pesticides and PCBs in air, water, soils and food;
- Competent administrative, technical and research staff;
- Well developed system for monitoring of POPs pesticides in the environment;
- Low level of air, water and soil POPs pollution of the territory of the country;
- Developed National Implementation Plan for management of POPs;
- Adopted legislation, harmonized with environment *acquis communitare* in respect to provisions of Stockholm convention;
- Sufficiently developed institutional system on national level for enforcement of environmental legal framework for management of POPs;

3.3.1. POPs Specific Action Plans

The proposed Action plans cover the period 2006-2028 and include the major measures and activities envisaged for the implementation of the NIP for POPs. The structure of the Action plans is in compliance with the objectives and priorities specified in items 3.2.3 and 3.2.5.

By the adoption and the implementation of the present plans, it is aimed that optimal balance

between the different legislative, institutional, economic and technical measures and implementation of integrated approach for POPs management to be achieved. The plans determine also the responsibilities of the various institutions and organizations related to the implementation of the proposed activities in NIP, the expected costs and the probable sources of funding.

3.3.1. 1. Action plan for POPs Pesticides

Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenxene, Mirex, Toxaphene and DDT (Annex A, part I and Annex B)

Action plan Objective is: To protect the human health and the environment from harmful impact of POPs Pesticides by taking necessary measures to minimize or prevent releases from stockpiles, consisting of or containing chemicals listed either in Annex A or Annex B and manage such stockpiles in a safe, efficient and environmentally sound manner.

The specific objectives of a POPs pesticides Action plan are:

- To review and summarize the production, use, import and export of the POPs chemicals listed in Annex A and Annex B of the Convention;
- To gather information on stockpiles and wastes containing, or thought to contain POPs pesticides;
- To assess the national legal and institutional framework for control of the production, use, import, export, safe storage and disposal of the POPs chemicals listed in Annex A and Annex B (excluding PCBs) of the Convention.
- To identify gaps in information required to complete the assessment.

Nº	MEASURES	ACTIONS	Responsible Bodies	Deadlines Start-End	Anticipated costs (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources of Financing
ACTIVITY 1: INSTITUTIONAL AND REGULATORY STRENGTHENING MEASURES						
1.1.	**Evaluation of effectiveness of existing legislation with regard to POPs pesticides**					
1.1.1		Enforcement of existing legislation, regulating POPs pesticides management.	MoEW, MoAF, MoH, NSPP A"Customs"	permanent	-	State budget (SB)
1.1.2		Exercising control over observation of existing regulatory bans for import & export of POPs pesticides.	MoEW, MoAF, A"Customs", NSPP	permanent	-	State budget (SB)
1.2.	**Amendment of Bulgarian legislation in case of including new POPs chemicals in Stockholm Convention**					
1.2.1		Duly amending and supplementing of legislative acts and regulations in case of including new POPs chemicals in Annex A of Stockholm convention.	MoEW, MoAF	permanent	-	State budget (SB)

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
1.3.	**Reference measurement methods for POPs analysis**					
1.3.1		Reference measurement methods for POPs analysis in waste. International overview on measurement methods for POPs in waste. Evaluation of existing measurement methods and proposals in view of European reference methods.	MoEW	2006-2007	30	GEF, International funding
1.3.2		National legal framework review.Assessment of Existing limit values for POPs pesticides	MoEW	2006	20	GEF
1.3.3		Application and enforcement of EU Reference measurement methods/Standards for POPs pesticides analysis in the environment, levels of accumulation in human body, in food of vegetable and animal origin	MoEW, MoH, NCPHP, MoAF	permanent	- MoAF	MoEW, MoH, NCPHP,
1.4.	**Administrative capacity strengthening of authorities, responsible for POPs pesticides management**					
1.4.1		Strengthening of municipal administrative capacity for control and save storage of obsolete pesticides' stockpiles, including appointment of additional personnel.	Municipalities	permanent	- (MB)	Municipal Budgets
1.4.2		Strengthening the laboratory infrastructure for analysis of POPs pesticides in the environmental media, in foods of vegetable and animal origin and the levels in human tissues; including delivery of necessary equipment, personnel training and lab accreditation.	Interested institutions and authorities	2006-2009	Private and state funding	International findings, SB, Interested institutions and authorities
ACTIVITY Nº 2: MEASURES TO ENSURE SUFFICIENT AND RELIABLE DATA ON OBSOLETE PESTICIDES, INCLUDING THOSE CONSISTING OF OR CONTAMINATED WITH POPs						
2.1.	**Maintaining of actual and reliable data base for obsolete pesticides**					
2.1.1		Annual updating of the data base for obsolete pesticides stockpiles	MoEW, EEA,	annually	-	MoEW, EEA

Nº MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
2.1.2	Development of a plan for environmentally sound management of obsolete pesticide stockpiles aiming to reduce/eliminate the obsolete pesticides consisting of or containing/ contaminated with POPs	MoEW	2006-2009	50 UNEP,	GEF, MoEW in-kind co-financing
2.1.3	Development of a Programme for identifying obsolete pesticides stockpiles, consisting of or containing/contaminated with POPs	MoEW	2006-2007	25	GEF, MoEW in-kind co-financing
2.1.4	Detailed inventory of 2308 t of „unknown" obsolete pesticides not yet secured, stored in 477 unrepaired in-use warehouses. Detailed field survey of known sites. Identifying the assumed available between 22.3 t-25.8 t POPs pesticides and approx. 30 t mixtures, consisting of or contaminated with POPs, if international funding is provided.	MoEW, EEA, MoAF, NPPS	2006-2009	500	GEF, MoEW, MoAF in-kind co-financing
2.1.5	Development of a plan for identifying and sanitation of contaminated with POPs pesticides sites and the surroundings areas around the obsolete pesticides storehouses.	MoEW, minicipalities	2006-2009	50	GEF, International Co-financing and in-kind MoEW financing
2.2. **Updating NIP for POPs**					
2.2.1	Updating NIP for POPs pesticides	MoEW	2010 every 5 years	30	MoEW
ACTIVITY Nº 3: MEASURES TO REDUCE OR ELIMINATE OBSOLETE PESTICIDES STOCKPILES, INCLUDING THOSE CONSISTING OF OR CONTAMINATED WITH POPs					
3.1. **Environmentally sound storage and reduction of Obsolete pesticides stockpiles**					
3.1.1	Development of Obsolete Pesticides Storage and Stock control Manual and Guidelines for the environmentally sound Management of obsolete and unwanted pesticides"	MoEW	2006-2007	40	GEF, in-kind MoEW financing
3.1.2	Handling, collecting, repacking, transporting and storing in an environmentally sound manner of obsolete pesticides in newly constructed or repaired centralized and municipal storages facilities or capsulation in BB-cubes	MoEW, MoAF Municipalities	permanent	1 500 annually	MoEW, MoAF, projects financed by EMEPA, Fund „Agriculture"

Nº MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
3.1.3	Providing municipal safeguarding of centralized storage houses for obsolete pesticides	Municipalities	2007-2015	-	Municipal budgets (MB)
3.1.4	Old storehouses demolishing and sanitation of storage sites, disengaged from old storehouses and remediation of areas and soils around them.	Municipalities	2008-2015	300-500 annually	Municipal budgets (MB), projects financed by EMEPA, Fund „Agriculture"
3.2. **Safe and environmentally sound disposal of obsolete pesticides stockpiles**					
3.2.1	Review of the existing methods and technologies for POPs pesticides reduction and/or elimination	MoEW	2006	10	GEF
3.2.2	Analyzing & Preliminary Assessment of the technologically & economically feasible options for elimination/disposal of obsolete pesticides	MoEW	2006	10	GEF
3.2.3	Study of National capacity for environmentally sound POPs disposal. Feasibility study and investments cost assessment.	MoEW	2006-2008	75	GEF, International Co-financing and in-kind MoEW financing
3.2.4	Development of project proposals for Safe removal and storage/disposal options	municipalities	permanent	40	MB
3.2.5	Long-term business plan for disposal of obsolete POPs pesticides currently in long-term storage, site remediation	MoEW, MoAF, Municipalities	2007-2009	180	GEF, International Co-financing and in-kind MoEW financing
3.2.6	Removal and disposal abroad of 2308 t of „unknown" obsolete pesticides, stored in 477 unrepaired in-use warehouses and contaminated soils, if international funding is provided.	MoEW, MoAF, municipalities	2007-2010	13927	GEF, International Co-financing and in-kind MoEW financing

Nº MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
3.2.7.	Partial disposal of obsolete pesticides, identified as consisting of or contaminated with POPs abroad, if international funding is provided.	MoEW	2007-2010	332	GEF, International Co-financing and in-kind MoEW financing
3.2.8	Gradual disposal/elimination of obsolete pesticides stockpiles.	MoEW, MoAF, Municipalities	2010-2028	- not yet defined	SB, International funding
ACTIVITY Nº 4: MEASURES FOR CONTROL, MONITORING AND REPORTING					
4.1. **Strengthening of the control over the implementation of legal requirements for storage of obsolete and out-of-date pesticides stockpiles**					
4.1.1	Exercising permanent control over the implementation of legal requirements for safe storage of obsolete and unusable pesticides stockpiles and regular inspections of storage facilities status	MoEW, RIEW, MoAF, NSPP	permanent	20	MoEW, MoAF
4.2. **Monitoring**					
4.2.1	Monitoring of soils with local spot POPs pollution (where DDT and metabolites values exceeded the maximum admissible concentration and intervention concentration level) by repeated soil sampling and analysis, especially in surrounding areas of obsolete pesticides storehouses and in spot points where residual quantities of DDT[sum] and metabolites were registered.	MoEW, EEA	2006 -2007	20 EEA	MoEW,
4.2.2	Monitoring of underground waters for POPs content in the regions close to storages for obsolete and out-of-use pesticides	MoEW, EEA	once per year	20	MoEW, EEA
4.3. **Reporting**					
4.3.1	Annual reporting of existing obsolete and out-of-date pesticides stockpiles, stored in warehouses and BB-cubes	MoAF,MoEW, EEA	permanent	10	MoAF, MoEW, EEA
4.3.2	Maintaining of the Functional Subsystem „Control and soil protection from POPs pollution - obsolete pesticides storages"- Preparation of annual enquiries for warehouse status and obsolete pesticides, stored in them.	MoEW, RIEWs, EEA	annually	10	MoEW, EEA

№	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
ACTIVITY № 5: MEASURES TO ENCOURAGE RESEARCH AND DEVELOPMENTS (Article 11)						
5.1.	**Risk assessment for the humans from POPs pesticides impact**					
5.1.1		Carrying out investigations on POPs level accumulation, population health status assessment with priority to risky groups of population	Interested institutions and authorities	2006-2009	210	WHO, EU health funds
5.2.	**Promoting research activities and developments for POPs pesticides impact on the human health and the environment**					
5.2.1		Carrying out representative research investigations for POPs levels of accumulation in risky groups of population, especially women and children in the regions close to storages for obsolete pesticides	MoH, NCPHP	2007-2009	200	WHO, MoH
5.2.2		Carrying out representative research investigations for POPs levels in soils and products of vegetable origin in the rural areas close to OP storage facilities	MoAF, MoEW	2007-2009	300	GEF,external co-financing, MoAF, MoEW in-kind funding
ACTIVITY № 6: MEASURES FOR PUBLIC INFORMATION, AWARENESS AND EDUCATION (Article 10)						
6.1.	**Development of Educational and Awareness programs on POPs issues**					
6.1.1		Development and carrying out „round-tables" discussions for public awareness raising on POPs effects oh human health and the environment with gender focus on young people and target groups of local communities and other counterparts	MoEW	2006	30	UNEP Chemicals Small grant component, MoEW
6.1.2		Development and implementation of educational and awareness programs on POPs as well as on their health effects, especially for women, children and the least educated"	MoH, NCPHP	2006-2008	50	GEF, WHO, MoH in- kind financing
6.2.	**Raising pupils and students knowledge on POPs issues**					
6.2.1		Development of educational programs on POPs	MoES, UCTM	2007-2009	50	MoES
6.2.2		Preparing and editing suitable school text books for POPs	MoES	2008-2009	30	MoES
6.3	**Training of trainers over the implementation of measures envisaged in the NIP for POPs**					
6.3.1		Development of training materials for the „Training of trainers" Workshop - specialists and experts from the competent state authorities	MoEW	2006	5	GEF

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
6.3.2		Carrying out Seminars and Training Workshops for qualification raising of experts of relevant state authorities over the NIP implementation.	MoEW	2006	20	GEF
6.3.3		Carrying out Seminars for industry professionals and NGOs over the NIP implementation.	MoEW	2006	5	GEF
6.3.4		Organizing and carrying out Regional Multinational Workshop with participation of Bulgaria and 23 countries from Central & Eastern Europe, Asia and Pacific Ocean for experience and skill exchange, lessons learnt and training on POPs NIP implementation."	UNEP Chemicals, MoEW	2006	-	UNEP Chemicals
6.4	**Provision of**	**Public access and awareness raising on POPs issues**				
6.4.1		Publication of NIP and Action plan for POPs pesticieds on the POPs Web page of MoEW.	MoEW	2006	2	GEF
6.4.2		Updating of POPs Web page on MoEW Web site, including available information on POPs	MoEW	permanent	-	MoEW
6.4.3		Publication and dissemination of NIP for POPs	MOCB	2006	22	GEF
6.4.4		Provision access to the public of available information on POPs trough Info-centers at MoEW, EEA and RIEWs.	MoEW, EEA, RIEWs	permanent	-	MoEW
6.4.5		Providing opportunities for public input, opinions and statements and raise questions & responses , addressing POPs management through the Forum „Green Graphite" on the MoEWs Web site.	MoEW	2006-2007	-	MOCB
6.4.6		Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level through projects, financed by GEF Small Grants Project	NGOs	2006-2008	75	GEF UNDP, Small grant programme
6.4.7		Development and strengthening NGOs public relation in the process of development of projects, concerning POPs management and for their effects on human health and the environment.	MoEW, MoAF, MoH, MoES, municipalities	2006-2008	-	MoEW, MoAF, MoH,MoES, municipalities
6.5.	**Development and exchange of educational and public awareness materials at the national for POPs and their health and environmental effects**					

Nº MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
6.5.1	Development, publication and dissemination of POPs popular brochures for their human health and environmental effects	MoEW	2006	8	GEF
6.5.2	Elaboration of a ecological NGOs Project proposal „Development, publication and dissemination of POPs popular brochures and leaflets for awareness raising on POPs pesticides and their effects on human health and the environment among the for rural population"	NGOs	2007-2008	20	IPEN, GEF/ UNDP, Small grants pro-gramme
6.5.3	„POPs: Be careful. Strengthening NGOs' ca-pacity in realization of the information cam-paigns and improve communications with local community and other counterparts. „	NGO	2006-2007	12	IPEN, GEF/UNDP, Small grants programme
6.5.4	NGOs participation in the society awareness raising on POPs Campaign for raising public awareness by a number of seminars and round tables and wide information dissemi-nation through mass media and by means of leaflets and booklets	NGO	2006-2007	50	IPEN, GEF/UNDP Small grants Pro-gramme
6.5.5	Sharing information about POPs Public aware-ness campaign on POPs „Planet without POPs	MoEW	2006-2007	-	MoEW
6.5.6	POPs information dissemination & networ-king of scientific publications, developed projects, seminars and scientific forums on POPs Web-page of MoEW.	MoEW, MoAF, MoH, MoEE	2006-2007	-	MoEW, MoAF, MoH, MoEE
6.6. **Reporting (Article 15)**					
6.6.1	Report development for the progress on the NIP implementation in regard with POPs pesticides	MoEW	2010	10	MoeW

For the implementation of urgent measures and activities, envisaged in NIP under the preliminary financial needs assessment approx. 16 983 000 BGN (about 10 614 000 US $) are required. Due to the limited financial capabilities of the country to provide funding from state budget other sources shall be surched – GEF, international donor programmes and intergovernmental agreements.

3.3.1.2. Action plan for PCBs in Equipment

(TRANSFORMERS AND CAPACITORS)
(Annex A , Part I and II)

Action plan Objective is: To reduce Exposures and Risk for human health and the environment from the harmful impact of PCBs by taking measures for better management of PCBs in equipment and oils and promotion of early actions for phasing-out of PCBs equipment and environmentally sound disposal of equipment (transformers and capacitors) and oils, containing PCBs.

Objectives of a PCBs assessment is to assess current uses of PCBs within the country and to understand the likely quantities, equipment types, holders, operational practices, health and safety management and end-of-life treatment of PCB containing equipment and materials.

№	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
ACTIVITY 1: INSTITUTIONAL AND REGULATORY STRENGTHENING MEASURES FOR MANAGEMENT OF PCBS IN EQUIPMENT						
1.1.	**Harmonization of Bulgarian legislation for management of PCBs in equipment and wastes, containing PCBs in compliance with the provisions of Directive 96/59/EEC for disposal of polychlorinated biphenyls and polychlorinated terphenyls and Stockholm convention**					
1.1.1		Development and adoption of Regulation on the requirements for the order and the manner of inventory, labeling and decontamination of equipment containing PCBs, as well as the treatment and transportation of waste containing PCBs.	MoEW	2006	10	MoEW
1.2.	**Introducing of regulatory requirements for inventory, phasing out, safe storage and environmentally sound decontamination and disposal of equipment, containing PCBs and waste, containing PCBs.**					
1.2.1		Development of Plan for ESM of PCBs,equipment, containing PCBs and waste, containing PCBs: - Carrying out a detail inventory of equipment, containing PCBs; - Measures and terms for phasing out of inventoried equipment, containing PCBs; - Measures for safe storage of phased-out equipment, containing PCBs and wastes, containing PCBs - insulating, hydraulic and heat transmission oils; - Measures and terms for decontamination and environmentally sound disposal of equipment, containing PCBs and waste, containing PCBs; - Financial security of activities; - Monitoring and control over the in-use equipment, containing PCBs - reporting regimes incorporating incentives and penalties;	MoEW, holders of equipment, containing PCBs	2007-2009	120 private & state funding	International funding, holders of equipment, containing PCBs, MoEW

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
1.3.	**Effective enforcement of existing legislation related to PCBs**					
1.3.1		Application and enforcement of existing national legislation , regulating PCBs management - observing over the bans for import and export of PCBs and permitted uses of PCBs restricted to use in close systems.	MoEW, Customs Agency, importers, exporters, holders of PCBs equip ment	permanent	-	State budget (SB)
1.4.	**Prepare methodological manuals, guidelines, supporting enforcement of existing legislation for equipment, containing PCBs and waste, containing PCBs**					
1.4.1		Development of technical Manual for carrying out detailed inventory of equipment, containing PCBs and Practical Guidelines for decontamination/clean-up and dismantling of equipment, collection and storage of waste, containing PCBs	MoEW	2006	20	MoEW
1.4.2		Development of Practicle Guidelines for ESM of equipment , containing PCBs by the owners and handlers of equipment, containing PCBs: - for decontamination or environmentally sound disposal of equipment, containing PCBs and waste, containing PCBs and deadlines for implementation; - for safe storage of phased-out equipment, containing PCBs and wastes, containing PCBs including insulating, hydraulic and heat transmission oils, containing PCBs; - for safe operation and maintenance, monitoring and control over the in-use equipment, containing PCBs; - reporting, risk assessment and management;	Holders of equipment, containing PCBs, MoEW's methodological support	2006-2008	80 Private funding	Holders of equipment, containing PCBs
1.5.	**Reference measurement methods for POPs analysis**					
1.5.1		National legal frameworks review. Existing limit values analysis for PCBs.	MoEW	2006	20	GEF
1.5.2		Application and enforcement of EU Reference measurement methods/standards for PCBs measurements in oils - EN ISO 3170; EN ISO 3171; EN ISO 60 475; EN 12 766-1; EN 12 766-2; EN 61 619	Interested institutions and authorities	permanent	-	Interested institutions and authorities
1.6.	**Strengthening of institutional capacity for PCBs management on regional level**					
1.6.1		Strengthening of administrative capacity of RIEWs for control and inspection of operating PCBs equipment and for the conditions for storage of dismantled equipment and wastes, containing PCBs	MoEW, RIEWs	permanent	-	MoEW

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
1.6.2		Carrying out Seminars and Training Workshops for qualification raising of industry representatives, personnel, engaged in MoEW in regard to: - Carrying out detailed PCBs equipment inventory; - ES storage, decontamination and disposal; - Control of PCBs equipment holders and wastes, containing PCBs;	MoEW	2006	12	GEF
1.6.3		Feasibility study for country needs for the building up of laboratories for PCBs analysis in oils and strengthening of lab infrastructure for control and analysis of PCBs in air, water, soils, food and wastes. Cost benefits assessment of required funding and investments for construction, equipment and personnel training	MoEW, EEA	2006-2008	50	International funding, EEA
1.6.4		Building up laboratory infrastructure for analysis of PCBs in oils, including delivery of necessary equipment, training of personnel and lab accreditation.	Interested authorities, PCBs equipment holders	2007-2011	2 250	External funding, SB
1.6.5		Accreditation of sufficient laboratories for analysis of PCBs oils	Interested authorities	2006-2009 Private and state funding		Interested authorities
ATIVITY Nº 2: MEASURES FOR THE PROVISION OF SUFFICIENT AND RELIABLE DATA ON THE OPERATING AND OUT-OF-USE PCBs EQUIPMENT AND WASTES						
2.1.	**Maintenance of actual and reliable data base for equipment and oils, containing PCBs**					
2.1.1		Detailed inventory of equipment (in-use and phased out) and oils, containing PCBs	MoEW, PCBs equipment holders	2006-2008	500	PCBs equipment holders, MoEW
2.1.2		Establishment of data base for in-use and phased out equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3 and waste, containing PCBs and its regular updating.	MoEW	2006-2008	80	External funding, MoEW, GEF
2.1.3		Software for data-base for PCBs equipment - type, oil trade mark, year of production, manufacturer and holder.	MoEW	2006	-	External funding, MoEW
2.2.	**Updating of National Implementation plan for PCBs management**					
2.2.1		Updating of the National Implementation plan for POPs management - PCBs in equipment and oils.	MoEW	2010 every 5 years	70	SB
ACTIVITY Nº 3: MEASURES FOR MINIMIZATION AND DISPOSAL/DESTRUCTION OF PCBs IN EQUIPMENT AND OILS						
3.1.	**Safe operation of equipment, containing PCBs – transformers and capacitors and gradual phasing out**					
3.1.1		Prepare short-term plan for labeling of in-use equipment, containing PCBs	PCBs equipment holders	2006-2007	private funding	PCBs equipment holders

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
3.1.2		Prepare long-term plans for phase out of in-use PCBs equipment, dismantling, decontamination, safe storage, appropriate disposal ahead of national legislation deadlines	PCBs equipment holders	2007-2010	80 private funding	External funding, PCBs equipment holders
3.1.3		Develop detailed business plans for environmentally sound end-of-life management for highest risk equipment, containing PCBs and waste, containing PCBs	PCBs equipment holders	2006-2010	20 private funding	PCBs equipment holders
3.1.4		Labeling of in-use equipment, containing PCBs – transformers and capacitors	PCBs equipment holders	2006-2007	private funding	PCBs equipment holders
3.1.5		Prepare Plan for monitoring and control of in-use equipment, containing PCBs due to be decontaminated and disposed till 2010.	PCBs equipment holders	2006-2007	private funding	PCBs equipment holders
3.1.6		Decontamination of transformers with PCBs concentration above 0,05 % by weight and volume above 5 dm^3 ;	PCBs equipment holders	2007	private funding	PCBs equipment holders
3.1.7		Prepare Plan for monitoring and control of in-use equipment, containing PCBs to be phased out after end life-cycle term	PCBs equipment holders	After end life-cycle term	private funding	PCBs equipment holders
3.1.8		Phasing-out of equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3 ;	PCBs equipment holders	2010	private funding	PCBs equipment holders
3.1.9		Phasing-out of Equipment with volume above 5 dm^3 and PCBs concentration between 0,005% and 0,05 % by weight	PCBs equipment holders	Gradually but not later than 2025	private funding	PCBs equipment holders
3.2.	**Safe storage of phased-out equipment, containing PCBs and waste, containing PCBs**					
3.2.1		Provision of the necessary storage sites for safe storage of phased out equipment, containing PCBs.	PCBs equipment holders	after removal from use	private funding	PCBs equipment holders
3.2.2		Provision of the necessary storehouses for safe storage of wastes containing PCBs	PCBs equipment	permanent	private funding	PCBs equipment holders
3.3.	**Disposal of the equipment and wastes, containing PCBs**		MoEW	2005-2006	10	GEF
3.3.1		Review and Evaluation of the existing PCBs destruction technologies for equipment and oils and elaboration of criteria for choice of PCBs destruction technologies	MoEW	2005-2006	10	GEF
3.3.2		Analysis and preliminary evaluation of technical and economical opportunities and options for destruction of waste, containing PCBs				
3.3.3		National capacity for phased out equipment and waste oils, containing PCBs. Feasibility study, required investments evaluation and criteria setting for destruction PCBs technology selection	MoEW	2006-2007	75	External funding

Nº MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
3.3.4	Export for disposal of 20,12 t waste PCBs transformer oils abroad	MoEW	2007-2009	67	GEF, External funding
3.3.5	Export for disposal of 844 phased out PCBs capacitors abroad	MoEW	2007-2009	6350	GEF, External funding
3.3.6	Construction of National Hazardous waste treatment centre and corresponding infra-structure for hazardous wates landfilling	MoEW	2008-2014	87000	External resources, ISPA, SB
3.3.7	Disposal and recycling of highest risk equip-ment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3	PCBs equipment holders	after removal from use, but not later than 2010	not defined yet Private funding	PCBs equipment holders
3.3.8	Disposal and recycling of PCB equipment with volume above 5 dm^3 and PCBs con-centration between 0,005% and 0,05 % by weight	PCBs equipment holders	after removal from use, but not later than 2028	not defined yet Private funding	PCBs equipment holders
ACTIVITYNº 4: MEASURES FOR CONTROL & MONITORING					
4.1. **Control over equipment and wastes, containing PCBs**					
4.1.1	Permanent control over the remaining in-use equipment, containing PCBs and over the conditions for storage of waste, containing PCBs, including dismantled equipment and wastes, containing PCBs	MoEW, RIEWs	permanent	-	MoEW
4.2. **Monitoring over equipment and wastes, containing PCBs**					
4.2.1	Development of a Manual for the procedu-res and requirements for monitoring, and inspections of equipment, containing PCBs remaining in use.	MoEW	2006-2007	30	GEF, MoEW
ACTIVITY Nº 5: MEASURES TO PROMOTE RESEARCH WORK AND DEVELOPMENTS					
5.1. **PCBs impact risk assessment for the human health**					
5.1.2	Carrying out investigations on identifying PCBs level accumulation, population health status assessment with priority to risky groups in the regions with high concentration of PCBs equipment.	MoH, NCPHP	2006-2009	210	State budget, WHO, EU health funds
5.2. **Promote Research And Developments for PCBs effects on human health**					
5.2.1	Carrying out representative investigations of PCBs accumulation levels in breast milk and fat tissue in women - suckling mothers in the regions with high concentration of PCBs equipment	MoH, NCPHP	2006-2009	210	External financing, WHO, EU Health funds MoH
5.2.2	Undertake research works geared on alleviating the effects of PCBs on reproductive health.	MoH, NCPHP	2007-2009	200	WHO, EU Health funds MoH

Nº	MEASURES ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
ACTIVITY Nº 6: MEASURES FOR PUBLIC INFORMATION, AWARENESS AND EDUCTAION ON PCBS ISSUES					
6.1. **Development of Educational and Awareness programmes on POPs issues**					
6.1.1	Development and carrying out „round-tables" discussions for public awareness raising on POPs effects oh human health and the environment with gender focus on young people and target groups of local communities and other counterparts	MoEW	2006	30	UNEP Chemicals Small grant component, MoEW
6.1.2	Development of educational programs on PCBs, as well as on their health effects, especially for women, children and the least educated.	MoH, NCPHP	2006-2008	25	WHO, EU Health funds MoH
6.1.3	Development of awareness programs on POPs, as well as on their environmental effects, especially for women, children and the least educated.	NGO	2007-2009	25	GEF small grants programme, IPEN
6.2. **Raising pupils and students knowledge on POPs issues**					
6.2.1	Development of educational programs on POPs	MoES, CTMU	2007-2009	50	MoES, External funding
6.2.2	Preparing and editing suitable school text books for POPs	MoES	2008-2009	30	MoES, External funding
6.3. **Training of trainers over the implementation of measures envisaged in the NIP for POPs**					
6.3.1	Development of training materials for the „Training of trainers" Workshop - specialists and experts from the competent state authorities	MoEW	2006	5	GEF
6.3.2	Seminars and „Training of trainers" Workshops for the experts of MoEW, RIEWs on NIP implementation with participation of foreign experts	MoEW,	2006	20	GEF
6.3.3	Training Workshop for the representatives of industry and NGOs for explanation of POPs management legislation and NIP implementation.	MoEW	2006	5	GEF
6.3.4	Organizing and carrying out Regional Multi-national Workshop with participation of Bulgaria and 23 countries from Central & Eastern Europe, Asia and Pacific Ocean for experience and skill exchange , lessons learnt and training on POPs NIP implementation."	UNEP Chemicals, MoEW	2006	-	UNEP Chemicals
6.4. **Provision of Public access and awareness raising on PCBs issues**					
6.4.1	Publication of NIP and Action plan for PCBs in equipment and oils on the POPs Web page of MoEW.	MoEW	2006	2	GEF
6.4.2	Updating of POPs Web page on MoEW Web site, including all available information on PCBs	MoEW	permanent	-	MoEW

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines costs	Anticipated of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
6.4.3		Publication and dissemination of NIP for POPs	MoEW	2006	22	GEF
6.4.4		Provision to the public available information on POPs trough Information centers at MoEW, EEA and at RIEWs.	EEA, MoEW, RIEWs	permanent	-	MoEW
6.4.5		Providing opportunities for public input, opinions and statements and raise questions & responses, addressing POPs/PCBs management through the Forum „Green Graphite" on the MoEWs Web site.	MoEW	2006-2007	-	MoEW
6.4.6		Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level through projects, financed by GEF Small Grants Project	NGOs	2006-2008	75	GEF UNDP, Small grant programme
6.4.7		Development and strengthening NGOs public relation in the process of development of projects, concerning POPs management and for their effects on human health and the environment.	MoEW, MoH, municipalities	2006-2009	-	MoEW, MoH, municipal budget
6.5.	**Development and exchange of educational and public awareness materials at the national for POPs and their health and environmental effects**					
6.5.1		Development, publication and dissemination of POPs popular brochures for their human health and environmental effects	MoEW	2006	8	GEF
6.5.2		Development, publication and dissemination of POPs popular brochures and leaflets for PCBs issues and their effects on human health among operators of PCBs equipment	MoH, NCPHP, MoLSP, MoEE	2007-2008	60	WHO, IPEN, MoH, MoLSP, MoEE, EU Health funds
6.5.3		POPs: Be careful. Strengthening NGOs' capacity in realization of the information campaigns and improve communications with local community, governmental departments and other counterparts.	NGO	2007-2009	12	GEF/UNDP Small grants Programme
6.5.4		NGOs participation in the society awareness raising on POPs. Campaign for raising public awareness by a number of seminars and round tables and nformation dissemination through massmedia and by means of leaflets and booklets.	NGO	2007-2009	50 Small	GEF/UNDP grants Programme
6.5.5		Sharing information about POPs Public awareness campaign on POPs „Planet without POPs"	MoEW	2006-2007	-	MoEW
6.5.6		PCBs information dissemination&networking of scientific publications, developed projects, seminars and scientific forums on POPs Web-page of MoEW.	MoEW, MoAF, MoH, MoEE	2006-2007	-	MoEW, MoAF, MoH, MoEE
6.6.	**Reporting (Article 15)**					
6.6.1.		Report development for the progress on the NIP implementation, in regard with PCBs in equipment and oils.	MoeW	2006 every 5 years	10	MoEW

For the implementation of urgent measures and activities, envisaged in NIP in regard to PCBs in equipment under the preliminary financial needs assessment approx. 8 698 000 BGN (about 5 346 000 US $) are required. Due to the limited financial capabilities of the country to provide funding from state budget other sources shall be surched – private funding from PCBs equipment holders, GEF, international donor programmes and intergovernmental agreements.

3.3.1.3. Action plan for POPs releases from unintentional production

Polychlorinated dibenzodioxins (PCDD) and Polychlorinated dibenzofurans (PCDF), hexachlorobenzene (HCB) and polychlorinated biphenyls (PCB)

(Dioxins/Furans, PCBs and HCB)

(Annex C)

Action plan Objective is: To limit the risk for human health and the environment through continuing minimization of total releases derived from anthropogenic sources of Dioxin/Furans, PCBs and HHB listed in Annex C.

The specific objectives of the Action plan for unintentionally produced POPs releases are: to carry out a preliminary evaluation of current and projected releases of the chemicals listed in Annex C of the Convention; to detail existing laws and policies relating to the management of releases of these chemicals and to evaluate their effectiveness and deficiencies.

№	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
ACTIVITY 1: INSTITUTIONAL AND REGULATORY STRENGTHENING MEASURES FOR THE MANAGEMENT OF POPS RELEASES FROM UNINTENTIONAL PRODUCTION						
1.1.	**Evaluation of the efficacy of the legislation relating to the management of POPs releases from unintentional production**					
1.1.1		Application and enforcement of existing legislation, regulating the Norms for admissible emissions of D/Fs, PCBs & HHB in Atmospheric Air from Static Sources.	MoEW, Companies-polluters	permanent	-	State budget, Companies-polluters
1.1.2		Application and enforcement of existing legislation for Major Accident Prevention and Control, involving dangerous substances (Seveso Directive) and for Integrated Pollution Prevention and Control (IPPC Directive),relating POPs releases from unintentional production.	MoEW	permanent	-	MoEW
1.2	**Improvement of the legislation relating to Integrated Pollution Prevention and Control of POPs releases from unintentional production .**					
1.2.1		Development of Guidelines on Best Available Techniques (BAT) for restriction and reduction of D/Fs, based on projected Guidelines to be developed by Secretariat of Stockholm Convention	MoEW, EEA	2007-2009	30	GEF, UNEP, in-kind MoEW financing
1.2.2		Development of Provisional Guidance on Best Environmental Practices (BEP) for restriction and reduction of D/Fs, based on projected Guidelines to be developed by Secretariat of Stockholm Convention	MoEW, EEA	2007-2009	30	GEF, UNEP, in-kind MoEW financing

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
1.3.	**Comparative analysis of available release modelling methodologies**					
1.3.1		Desk study comparison of CORINAIR, UNEP toolkit and other methods for modelling inventory of unintentional production of POPs	MoEW, EEA	2007	10	GEF, UNEP, MoEW
1.3.2		Adapting of „Methodology for Determination of the Emissions of Dioxin and Furan Releases in the Air" based on CORINAIR	MoEW, EEA	2007-2009	40	GEF, UNEP, in-kind MoEW financing
1.3.3		Analysis of existing concentration limits and National legal framework review. Existing limit values at national level.	MoEW	2005-2006	10	GEF
1.3.4		Detailed Dioxin/Furans, PCBs & HCB flows analyses by category sources.	MoEW	permanent	-	MoEW
1.3.5		Development and adoption of EU Reference measurement methods for sampling and analysis of Dioxin/Furans in the environmental media and human tissues	Interested authorities	2008-2011	100	Interested authorities
1.4.	**Strengthening of administrative and institutional capacity for the management of POPs releases from unintentional production on local level**					
1.4.1		Strengthening of the laboratory capacity for the control and analysis of PCBs and HCB in waste gases, waste waters, soils, human tissues and and food of vegetable and animal origin.	Interested authorities	2006-2009	-	External funding
ACTIVITY Nº 2: MEASURES TO ENSURE SUFFICIENT AND RELIABLE DATA ON POPs RELEASES FROM UNINTENTIONAL PRODUCTION						
2.1.	**Maintain of actual and reliable data base for unintentionally emitted POPs**					
2.1.1		Annual updating of data base for Dioxins/ Furans, PCBs & HCB in emissions.	MoEW, EEA	Every year	10	MoEW
2.2.	**Updating NIP for POPs**					
2.2.1		Updating NIP for POPs – Dioxin/Furans, PCBs & HHB releases	MoEW	2010 every 5 years	70	MoEW
ACTIVITY Nº 3: MEASURES TO REDUCE OR ELIMINATE RELEASES FROM UNINTENTIONAL PRODUCTION						
3.1.	**Promote the enforcement of measures to reduce POPs releases from unintentional production or remove the emissions sources.**					
3.1.1		Promote the application of available, feasible and practicle measures for a realistic and meaningful level of POPs release reduction or source elimination by including in the requirement of the issued Imtegrated permits of BAT and BEP for the facilities from energy, metallurgy, chemical and cement industries and domestic solid waste burning plants, where it deems appropriate.	MoEW, Companies polluters	2006-2009	Private financing	Companies polluters
ACTIVITY Nº 4: MEASURES FOR CONTROL						
4.1.	**Strengthening of the control over the implementation of admissible emission norms for Dioxins/Furans, PCBs & HHB.**					
4.1.1		Observing of existing admissible emission norms for Dioxins/Furans, PCBs and HCB by exercising permanent control over the implementation of the requirements of the issued Integrated permits.	MoEW, companies-polluters	permanent	-	MoEW, companies-polluters

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
4.1.2		Exercising permanent control over the implementation of existing limit values of PCBs releases in the air of working media.	MoLSP, companies-polluters	permanent	-	SB, companies-polluters
ACTIVITY Nº 5: MEASURES TO ENCOURAGE RESEARCH AND DEVELOPMENTS						
5.1.	**Promoting the research activities for dioxin/furans and PCBs effects on human health**					
5.2.1		Carrying out representative investigations for PCBs levels of accumulation in breast milk and fat tissue in risky groups of population – suckling mothers especially in the regions of high concentration of industrial sources with potential for comparatively high formation and release of POPs	MoH, NCPHP	2007-2009	180	WHO, EU health funds, MoH
5.2.2		Undertake research work geared towards alleviating the effects of Dioxins and Furans on reproductive health	MoH, NCPHP	2007 –2010	210	WHO, EU health funds, MoH
5.2.3		Carrying out representative investigations for Dioxin/Furans & PCBs content in chicken eggs in the regions close to the large thermal power stations (TPS)	MoAF, NVMS	2007-2009	180	External funding, FAO, MoAF
5.2.4		Carrying out investigations for Dioxin/Furans & PCBs concentrations in food (hen eggs and eggs products, milk and diary products, animal products,reach in fats, sea and river fish).	MoAF, NVMS	2007-2009	300	FAO, EU health funds, MoAF
ACTIVITY Nº 6: MEASURES FOR PUBLIC INFORMATION, AWARENESS AND EDUCATION (Article 10)						
6.1.	**Development of Educational and Awareness programs on POPs issues**					
6.1.1		Development and carrying out „round-tables" discussions for public awareness raising on POPs effects oh human health and the environment with gender focus on young people and target groups of local communities and other counterparts	MoEW	2006	30	UNEP Chemicals Small grant component
6.1.2		Development of educational programs on POPs – DIOX/Fs, PCBs and HCB, as well as on their health effects, especially for women, children and the least educated.	NGO	2007-2009	25	GEF, UNDP Small grants programme
6.1.3		Development of awareness programs on POPs, as well as on their environmental effects, especially for the least educated.	NGO	2007-2009	25	GEF, UNDP Small grants programme
6.2.	**Raising pupils and students knowledge on POPs issues**					
6.2.1		Development of educational programs on POPs	MoES, CTMU	2007-2009	50	MoES
6.2.2		Preparing and editing suitable school text books for POPs	MoES	2007-2009	30	MoES
6.3.	**Training of the trainers over the implementation of measures envisaged in the NIP for POPs**					
6.3.1		Development of training materials for the „Training of trainers" Workshop – specialists and experts from the competent state authorities	MoEW	2006	5	GEF

№	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Anticipated	Sources Financing
6.3.2		Seminars and „Training of trainers" Workshops for specialists and experts from the competent state authorities on NIP implementation.	MoEW	2006	20		GEF
6.3.3		Training Workshop for the representatives of industry and NGOs on NIP implementation.	MoEW	2006	8		GEF
6.3.4		Organizing and carrying out Regional Multinational Workshop with participation of Bulgaria and 23 countries from Central & Eastern Europe, Asia and Pacific Ocean for experience and skill exchange, lessons learnt and training on POPs NIP implementation."	UNEP Chemicals, MoEW	2006	-		UNEP Chemicals
6.4.	**Provision of Public access and awareness raising on POPs issues**						
6.4.1		Publication of NIP and Action plan for POPs releases from unintentional production on the POPs Web page of MoEW.	MoEW	2006	2		GEF
6.4.2		Updating of POPs Web page on MoEW Web site, including all available information on D/Fs, PCBs & HCB.	MoEW	permanent	-		MoEW
6.4.3		Publication and dissemination of NIP for POPs	MoEW	2006	22		GEF
6.4.4		Provision to the public of available information on POPs trough Information centers at MoEW, EEA and Information centres at RIEWs.	EEA, MoEW, RIEWs	permanent	-		MoEW
6.4.5		Providing opportunities for public input, opinions and statements and raise questions & responses, addressing POPs management through the Forum „Green Graphite" on the MoEWs Web site.	MoEW	2006-2007	-		MoEW
6.4.6		Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level through projects, financed by GEF Small Grants Project	NGOs	2006-2008	75		GEF UNDP, Small grant programme
6.4.7		Development and strengthening NGOs public relation in the process of development of projects, concerning POPs management and for their effects on human health and the environment.	MoEW, MoH, municipalities	2006-2008	-		MoEW, MoH, municipal budget
6.5.	**Development and exchange of educational and public awareness materials at the national for POPs and their health and environmental effects**						
6.5.1		Development, publication and dissemination of POPs popular brochures for their human health and environmental effects	MoEW	2006	8		GEF
6.5.2		Development, publication and dissemination of POPs popular brochures and leaflets for dioxin/furans, PCBs and HCB issues and their effects on human health among worker of energy and industry sectors.	MoH, NCPHP, MoLSP, MoEE	2007-2008	60		WHO, MoH, MoLSP, MoEE

Nº	MEASURES	ACTIONS Bodies	Responsible Start-End	Deadlines	Anticipated costs of (thous.BGN) Exch. rate 1 US$= 1,5 BGN	Sources Financing
6.5.3		Carrying out NGOs information campaign among least educated population for raising public awareness on human health threats from uncontrolled domestic waste & tire and stubble-fields burning as a source of persistent organic pollutants (POPs) - Dioxin/Furans".	NGO	2007-2009	25	GEF/ UNDP Small grants programme, IPEN
6.5.4		POPs: Be careful. Strengthening NGOs' capacity in realization of the information campaigns and improve communications with local community, governmental departments and other counterparts.	NGO	2007-2009	12	GEF/ UNDP Small grants Programme
6.5.5		NGOs participation in the society awareness raising on POPs. Campaign for raising public awareness by a number of seminars and round tables and wide information dissemination through massmedia and by means of leaflets and booklets.	NGO	2007-2009	50	GEF/ UNDP Small grants Programme
6.5.6		Sharing information about POPs Public awareness campaign on POPs „Planet without POPs"	MoEW	2006-2007	-	MoEW
6.5.7		POPs information dissemination & networking of scientific publications, developed projects, seminars and scientific forums on POPs Web-page of MoEW.	MoEW, MoAF, MoH, MoEE	2006-2007	-	MoEW, MoAF, MoH, MoEE
6.7.	**Reporting (Article 15)**					
		Report development for the progress on the NIP implementation in regard with to prevemtion/reduction of POPs releases from unintentional production	MoEW	2006 every 5 years	10	MoEW

For the implementation of urgent measures and activities, envisaged in NIP in regard to POPs releases under the preliminary financial needs assessment approx. 1 774 000 BGN (about 1 109 000 US $) are required. Due to the limited financial capabilities of the country to provide funding from state budget other sources shall be surched – private funding from companies-polluters, GEF, international donor programmes and intergovernmental agreements.

3.4. DEVELOPMENT AND CAPACITY-BUILDING PROPOSALS AND PRIORITIES

The implementation of the POPs NIP will require capacity strengthening in both technological/ laboratory infrastructure and human resources/qualification raising as wll as management capacity building. The high priority areas for NIP implementation resources needs are summarized below:

3.4.1. Technological & laboratory infrastructure

- **Construction of National Centre for treatment of hazardous waste**

Taking into account the requirement for establishment of adequate system of disposal facilities and installations the necessity of construction of National Centre for treatment of hazardous waste is corroborated. The centre will be composed of installation for incineration, facility for physical and chemical treatment, facility for solidification, recycling, landfill for hazardous waste, landfill for asbestos, laboratories, facilities for waste acceptance and storage. The national infrastructure for disposal of hazardous waste will include also regional landfill and transfer stations for hazardous waste serving the National centre.

- **Construction of laboratory infrastructure for analisis and determination of Dioxins/Furans in environment media and delivery of necessary equipment, personnel appointment, and training and accreditation of laboratories.**
- **Strengthening capacity of accredited laboratories for PCBs & HCB control in waste gases & waters, soils and food.**
- **Accreditation of Laboratory for carryng out determination of PCBs/PCTs in oils within the MoEW's system.**
- **Construction of new centralized warehouses for storage of obsolete pesticides** -

Minimization of the risk to the environment and human health arising from old unrepaired warehouses for obsolete and out-of-date pesticides is a high priority task.

This necessitates undertaking of permanent measures for improvement of the conditions for storage of these wastes and for their subsequent appropriate final disposal. Handling, collecting, repacking, transporting and storing in an environmentally sound manner of obsolete pesticides in newly constructed or repaired centralized and municipal storages facilities or capsulation in BB-cubes is a priority activity for risk reduction to the environment.

The export of the obsolete pesticides, especially those consisting of or contaminated with POPs pesticides, also can be acceptable solution due to the lack of appropriate facility for disposal in the country.

The financing of the activities for sanitation of abandoned sites for storage of obsolete pesticides constituting highest risk will be provided by the Enterprise for Management of Environmental Protection Activities, the funds of the Ministry of Agriculture and Forestry and the municipalities on whose territory the sites are located.

- **Providing necessary storage sites for safe storage of phased out PCBs equipment and waste, containing PCBs.**

The limited use of polychlorinated byphenyls (PCB), the lack of production of PCBs in the country and the ban on the import of PCBs containing materials and equipment since 1985 significantly reduced the scale of the problem for management of these waste. Nevertheless PCBs should be considered as a priority waste stream, which even in small quantities could cause significant damages to the environment and to the human health in case of improper management.

With the adoption of Regulation on the requirements for the order and the manner of inventory, labeling and decontamination of equipment containing PCBs, as well as the treatment and transportation of waste containing PCBs(SG 24/21.03.2006), the harmonization of the national legislation with the require-

ments of Directive 96/59/EC and Stockholm convention had been implemented on the remove from use disposal of PCBs and the rules for management of these waste streams had been laid down. The measures set in the PCBs regulation aim to ensure inventory of PCBs contaminated equipment in the country, its appropriate operation, phasing out such equipment within the deadlines fixed in the national legislation and the Stockholm convention and the subsequent storage and disposal of the waste.

- **Inventory of in-use and phased out PCBs contaminated equipment. Establishment and processing data base on PCBs/PCTs waste**

The complete detailed inventory of PCBs contaminated equipment will be of significant importance for the planning and organisation of decontamination, collection, storage, and disposal. For this purpose a detailed inventory of PCBs in equipment – in-use and phased out and of fresh and waste oils, containing PCBs should be carried out. The achievement of this objective requires the persons engaged in the inventory to be qualified and properly trained. The information about PCBs contaminated equipment obtained from the inventory and the subsequent activities for collection and disposal of the waste will be included in a specialized database for equipment and for fresh and used oils, containing PCBs .

- **Drawing up of plan and time schedule for disposal of PCBs waste**

The inventory of the PCBs contaminated equipment will be a base for development of a plan for gradual disposal of this type of waste. This plan should propose a schedule for phasing out the equipment and for disposal of the waste and to determine the responsibilities and the necessary funds for its implementation.

- **Provision of technical capacity for treatment and disposal of PCBs containing waste**

It is envisaged that the construction of the National Hazardous waste disposal centre will finish in 2009-2014. Incinerations in the existing facilities after their proper reconstruction, construction of specialized facilities and the export of PCB for disposal in other countries are possible options for the period till 2014. The final decision requires detail planning and evaluation of the different possibilities in the context of the risks to the environment and the expenditures for disposal and looking for possibilities for external funding.

3.4.2. Strengthening of the administrative capacity of the institutions responsible for management of POPs

The institutional and organizational frameworks at different levels of the POPs management are of high priority for the implementation of the legislation and the NIP. The MOEW will continue to coordinate at national level the POPs management activities including by establishment of procedures for effective interaction between the institutions engaged in the implementation of the different measures**.**

The National Focal Point of the Stockholm convention shall be responsible for reporting on the NIP progress implementation every 5 years to the Secretariat of the Stockholm convention . Successful implementation of NIP activities will depend on proper coordination among different stakeholders.

3.4.3. Personnel qualification raising & training and technical resources for the copmpetent institutions responsible for POPs management

The planning, regulation and enforcement of the POPs management legislation depend on the existing human resources in the responsible institutions. In order to support the implementation of the legislation, the competent authorities at national, regional, and municipal level need enough and well-trained personnel engaged with:

- development and implementation of legislation, technical standards and guidelines for POPs management activities;
- development of the long-term POPs management plan as a part of National Waste Management Programme (NWMP), planning and implementation on national and regional level;
- issuance of permits for activities with POPs waste and construction and operation of facilities for environmentally sound disposal;
- control, inspections and monitoring of the installations that generate POPs releases and/or operate PCBs equipment;
- initiation and enforcement of the measures for implementation of the legislation and the NIP for POPs;
- collection, processing, analyzing and reporting of data;
- preparation, development, assessment, realization and supervision of projects for NIP implementation activities set up in each POPs category Action plan, financed by GEF, EU funds and other bilateral and multilateral donor programmes.

The implementation of the NIP for POPs will require improvement of the administrative capacity on national, regional, and local level.

In order to ensure the supervision and control of the fulfilment of the NIP for POPs management, it is necessary the experts in RIEW and EEA to be trained on the NIP implementation measures and if required additional personnel in RIEW and EEA as well as in the other institutions engaged in the implementation of the NIP to be appointed. At the same time the experts working in the administration should have the necessary qualification. A couple of training workshops shall be organized for the experts at different levels.

- Seminars and workshops with wide participation of competent authorities for the enforcement of measures laid out in NIP and implementation assessment ;
- „Training of trainers" Workshops for the experts of state authorities responsible for the NIP implementation ;
- Training Workshop for the representatives of interested state authorities, municipal eco-experts, private sector professionals and NGOs for NIP implementation.

The implementation of the legislation will require also provision of appropriate equipment for the state institutions necessary for performance of their functions. In medium term aspect an assessment of the available equipment should be carried out and the priorities and the funds for supply of new equipment have to be determined. Special attention should be paid to the equipment for sampling and monitoring, the laboratories, the collection and processing of the POPs data.

The improvement of the administrative capacity will require provision of additional funds for the training personnel and provision of the necessary equipment and techniques.

3.4.4. Public participation and awareness raising on POPs issues

The necessity of continuation of the intensive dialogue between the competent authorities and the stakeholders that has been involved in the NIP development during the last years is corroborated. This will contribute to overcome a variety of social and institutional barriers to the information exchange and to reach consensus for the implementation of the measures envisaged in the NIP for management of POPs.

The campaigns for rising of the public awareness and the consultations with the stakeholder in POPs management activities will contribute to make correct decisions for the implementation of the NIP.

- **Dialogue with the industry and the authority responsible on POPs management**

To achieve an exchange of information and a transfer of the knowledge in order to improve the effectiveness of the POPs management, the dialogue with the private sector is indispensable. It is of primary importance to:

- inform the population and the industries on a regular basis and to involve them in the decision-making processes for POPs management issues;
- the organization of training courses in POPs management;

- **Development and implementation of long term communication and consultation with all stakeholders in POPs management**

The National campaign „For clean environment" and the competitions organized between municipalities, schools and NGO's concerning the cleaning up of polluted sites, as well as the regular dissemination of information materials, lead to raising of public awareness in the waste management issues.

The present NIP for POPs management envisages the gradual extension of the scope of this well-applied programme and its development in the directions of provision of environmental training in schools on POPs issues with active participation of NGOs, involvement of the industry to participate in development of best ecological practices, conducting of information campaigns, etc.

- Publication and wide dissemination of NIP for POPs ;
- Publication of NIP for POPs on the WEB site of MoEW
- Provision to the public of the available information on POPs/PCBs trough the information centre at Executive Environmental Agency and the existing Information centres at RIEWs;
- Providing opportunities for public input, opinions and statements and raise questions & responses , addressing POPs/PCBs management through the Forum „Green Graphite" on the MoEWs Web site
- Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level through projects, financed by GEF Small Grants Project
- „POPs: Be careful". Strengthening NGOs' capacity in realization of the information campaigns and improve communications with local community and other counterparts through projects, financed by GEF Small Grants Project;
- NGOs participation in the society awareness raising on POPs Campaign for raising public awareness by a number of seminars and round tables and wide information dissemination through mass media and by means of leaflets and booklets.
- Development of a Program to Disseminate Information and to Raise Public Awareness and carrying out „round-tables" discussions for public awareness raising on POPs effects oh human health and the environment with gender focus on young people and target groups of local communities and other counterparts;

- Development of educational programs on POPs, preparing and editing suitable school text books for POPs;
- Preparing of information materials for training the trainers – experts from competent state authorities;
- Development, publication and dissemination of POPs popular brochures and leaflets for public awareness raising on POPs issues and their effects on human health and the environment;
- POPs information dissemination & networking of scientific publications, developed projects, seminars and scientific forums on POPs on Web-page of MoEW.
- Development and strengthening NGOs public relation in the process of development of projects, concerning POPs management and for their effects on human health and the environment.
- Development and implementation, especially for women, children and the least educated, of educational and awareness programs on POPs, as well as on their health and environmental effects;
- Sharing information about POPs Public awareness campaign on POPs „Planet without POPs";

The communication objectives can be split up in two categories: awareness raising and stakeholders' training and communication.

The awareness raising has a long-term objective to achieve change in the behaviour of the population by awakening of the environmental risks related to the POPs issue, and their effects on human health and the environment;

The communication and the training are a process by which on the one hand, information is provided to the stakeholders and on the other hand ideas and actions, concerning POPs management are exchange and assessed.

The education and the consultation with the stakeholders, participating in POPs management activities will be important for the next years in the following directions:

- facilitation of the consultations on the implementation and the subsequently updating of the NIP for POPs;
- provision of information concerning the POPs management;
- obtaining of information, feedback and support by the stakeholders concerning the POPs management;
- facilitation of the formulation, consultation, approval, and implementation of the activities included in the NIP concerning the financing and reimbursement of the costs.

3.4.5. Draw up Project Proposals and apply for providing funding from Global Environment Facility

In the country, good prerequisites for integration of NIP for POPs in various fields of the general state policy exist. It is necessary definite evaluations and activities for its practical implementation, for example planning and enforcement of heterogeneous actions by various state and public organizations, producers, traders and consumers.

To achieve the convention' objectives, of essential importance shall be the implementation of measures over the control of POPs and the accomplishment of some investment projects for POPs disposal and destruction in an environmentally sound manner.

Efforts shall be put to use the existing financial mechanism for providing funding from Global Environment Facility (GEF) and bilateral, regional and multilateral twinning programmes to support various activities and measures set up in the NIP. For this purpose with priority Project Proposals shall be drawn up and Bulgaria shall apply for providing funding from Global

3.5. TIMETABLE OF THE POPS ACTION PLAN IMPLEMENTATION AND MEASURES OF SUCCESS

POPs Action Plan implementation		Timetable by years, starting from 2006																							
Years		Short term by 2010					Middle term by 2020										Long term by 2028								
Activities																									
1.	**Institutional management and coordination**																								
1.1.	Reporting and where appropriate updating the Action plan					♦				♦					♦					♦				♦	
2.	**Regulatory strengthening measures**					♦				♦					♦					♦					
2.1.	Duly amending and supplementing of legislative acts and regulations in case of including new POPs pesticides in Annex A of Stockholm convention.																								
2.2.	Development of adapted "Methodology for Determination of the Emissions of Dioxin and Furan Releases in the Air"																								
3	**Efficacy enforcement of existing legislation**																								
3.1.	Application and enforcement of EU Reference measurement methods/Standards for POPs pesticides analysis.																								
3.2.	Application and enforcement of existing legislation in the country, regulating the management PCBs																								
3.3	Exercising permanent control over the implementation of existing admissible emission norms for Dioxins/Furans released from large stationary sources.																								
4.	**Development of strategies and plans**					♦																			
4..1	Updating of NIP					♦				♦					♦					♦					
4.2.	Development of appropriate Programme for identifying obsolete pesticides stockpiles, consisting of or contaminated with POPs																								
4.3.	Development of a plan for environmentally sound management of obsolete pesticide stockpiles																								
4.4.	Development of Plan for ESM of PCBs: phasing out in-use PCBs equipment; safe storage of phased-out PCBs equipment and wastes, containing PCBs – insulating, hydraulic and heat transmission oils; ES disposal of PCBs equipment and waste;																								
4.5.	Prepare short-term plan for labeling and retrofilling of in-use PCB equipment																								
4.6.	Prepare long-term plans for phase out of in-use PCBs equipment, dismantling, decontamination, safe storage, appropriate disposal ahead of national legislation deadlines																								
4.7.	Development of a Plan for the reduction/prevention of the releases from unintentional production of Dioxins/Furans, PCBs and HCB.																								
4.8	Implementation of Action plan for gradual elimination/disposal of obsolete pesticides																								
4.9	Implementation of Action plan for PCBs in equipment and oils																								
5.	**Methodical and technical support**																								
5.1.	Development of Obsolete Pesticides Storage and Stock control Manual and Guidelines for the environmentally sound Management of obsolete and																								

	unwanted pesticides	
5.2.	Development of technical Manual for carrying out detailed inventory of PCBs equipment and Practical Guidelines for decontamination/clean-up and dismantling of equipment, collection and storage of PCBs waste oils	
6.	**Institutional strengthening and improvement of technological and laboratory infrastructure**	
6.1.	Evaluation of costs, required for NIP implementation	
6.2.	Building up laboratory infrastructure for analysis of PCBs in oils, including delivery of necessary equipment, training of personnel and lab accreditation.	
6.3.	Strengthening of laboratory infrastructure for control and analysis of PCBs in air, water, soils, food, and wastes, and accreditation of sufficient number of labs, including delivery of necessary equipment, training of personnel.	
6.4.	Accreditation of laboratories for analysis of PCBs in oils	
6.5.	Construction of new centralized and municipal storages facilities for storage of obsolete pesticides or capsulation in BB-cubes	
6.6.	Construction of National hazardous waste disposal centre and corresponding infrastructure for hazardous waste landfilling	
6.7	Provision of the necessary storage sites for safe storage of out-of-use PCBs equipment and oils	
7.	**Ensuring sufficient and reliable data for POPs management**	
7.1.	Annually updating of the data base for obsolete pesticides stockpiles	
7.2.	Carrying out detailed inventory by Sampling and analysis for POPs content determination of 2308 t "unknown" obsolete pesticides, stored in 477 operating unrepaired storages to ensure identifying of assumed stockpiles of approx. 22,3 -22,8 POPs pesticides and 30 t mixtures, containing or contaminated with POPs	
7.3.	Carrying out of detailed inventory of PCBs in equipment – operating andphased out equipment and oils, containing PCBs.	
7.4.	Establishment of data base for in-use and phased out equipment with PCBs concentration above 0, 05 % by weight and volume above 5 dm^3 andwaste, containing PCBs and its regular updating.	
7.5.	Sofware for data-base for PCBs equipment – type, oil trade mark, year of production, manufacturer and holder.	
7.6.	Annual updating of data base for Dioxins/Furans, PCBs & HCB in emissions .	
8.	**Gradual phasing out of in-use equipment – transformers and capacitors , safe storage and disposal of equipment and oils,containing PCBs**	
8.1.	Phasing-out of equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3 ;	
8.2.	Phasing-out of Equipment with volume above 5 dm^3 and PCBs concentration between 0,005% and 0,05 % by weight	
8.3.	Export for disposal of 20,12 t waste PCBs transformer oils abroad	
8.4.	Export for disposal of 844 phased out PCBs capacitors abroad	
8.5.	Disposal and recycling of highest risk equipment with PCBs concentration above 0,05 % by weight and volume above 5 dm^3	
8.6.	Disposal and recycling of PCB equipment with volume above 5 dm^3 and	

	PCBs concentration between 0,005% and 0,05 % by weigh																							
9.	**Safe storage and environmentally sound disposal/elimination of POPs pesticides**																							
9.1.	Repairing of old and construction of new centralized storage houses for obsolete pesticides																							
9.2.	Old storehouses demolishing and sanitation of storage sites, disengaged from old storehouses and remediation of areas and soils around them.									♦														
9.3	Removal and disposal abroad of 2308 t of “unknown” obsolete pesticides, stored in 477 unrepaired in-use warehouses and contaminated soils			♦																				
9.4.	Partial disposal of obsolete pesticides, identified as consisting of or contaminated with POPs abroad.		♦																					
9.5.	Gradual disposal/elimination of obsolete and out-of-date pesticides stockpiles											♦												
10	**Identifying and sanitation of contaminated sites with POPs pesticides**																							
10.1.	Sanitation of storage sites, disengaged from old storehouses and remediation of areas and soils around them.									♦														
10.2.	Sanitation of sites, where PCBs equipment was located.																					♦		
11	**Reduce Dioxin/Furans releases from unintentional production or remove the emissions sources.**																							
11.1.	Including within the provisions of Integrated Pollution Prevention and Control permits the requirements of Best available techniques (BAT) and Best environmental practice (BEP) with the goal to reduce and limit the POPs releases from unintentional production in energy, metallurgy, chemical & cement industry, existing firing installations for burning of solid municipal wastes , etc., where it is possible.					♦																		
12	**Research, development and monitoring**																							
12.1.	Carrying out representative investigations of PCBs accumulation levels in breast milk and fat tissue in women – suckling mothers in the regions with high concentration of PCBs equipment			♦																				
12.2.	Carrying out representative investigations for D/Fs and PCBs levels of accumulation in breast milk and fat tissue in risky groups of population – suckling mothers especially in the regions of high concentration of industrial sources with potential for comparatively high formation and release of POPs			♦																				
12.3	Carrying out representative investigations for Dioxin/Furans & PCBs content in chicken eggs in the regions close to the large thermal power stations (TPS)		♦																					
13.	**Public Information, Awareness & Education**																							
13.1.	Development of Communication Strategy for public awareness raising for POPs effects on human health and the environment		♦																					
13.2.	Development of Educational and Awareness programs on POPs issues especially for women, children and the least educated			♦																				
13.3	Raising students knowledge on POPs issues																							
13.4	Seminars and “Training of trainers” Workshops for the experts of MoEW, RIEWs on NIP implementation with participation of foreign experts	♦																						
13.5	Training Workshops for state & municipal environment experts, industry		♦																					

	professionals and NGOs over the implementation of measures envisaged in the NIP for POPs	
14	**Provision of Public access and awareness raising on PCBs issues**	
14.1	Publication of NIP on the POPs Web page of MoEW.	
14.2	Updating of POPs Web page on MoEW Web site, including all available information on POPs	
14.3	Publication and dissemination of NIP for POPs	
14.4	Provision to the public available information on POPs trough Information centers at MoEW, EEA and at RIEWs.	
14.5	Providing opportunities for public input, opinions and statements and raise questions & responses , addressing POPs/PCBs management through the Forum "Green Graphite" on the MoEWs Web site.	
14.6	Carrying out Information Campaigns by ecological NGOs for POPs effects on human health and the environment at regional level through projects, financed by GEF Small Grants Project	
14.7	Development of a Project proposal "A Program to Disseminate Information and to Raise Public Awareness on the Effects of Persistent Organic Pollutants (POPs) on human health and the environment, with a Gender Focus on students from Universities in Bulgaria"	
14.8	Development and strengthening NGOs public relation in the process of development of projects, concerning POPs management and for their effects on human health and the environment.	
15	**Development and exchange of educational and public awareness materials at the national for POPs and their health and environmental effects**	
15.1	Development, publication and dissemination of POPs popular brochures for their human health and environmental effects	
15.2	Development, publication and dissemination of POPs popular brochures and leaflets for PCBs issues and their effects on human health among operators of PCBs equipment	
15.3	POPs: Be careful!_Strengthening NGOs' capacity in realization of the information campaigns and improve communications with local community, governmental departments and other counterparts.	
15.4	NGOs participation in the society awareness raising on POPs Campaign for raising public awareness by a number of seminars and round tables and wide information dissemination through mass media and by means of leaflets and booklets.	
15.5	Sharing information about POPs Public awareness campaign on POPs "Planet without POPs"	
15.6	PCBs information dissemination & networking of scientific publications, developed projects, seminars and scientific forums on POPs Web-page of MoEW.	

Legend:
Progress report

3.6. PRELIMINARY ASSESSMENT OF THE FINANCIAL RESOURCES OF THE NATIONAL POPS MANAGEMENT ACTION PLAN

A preliminary assessment of the financial resources required for the implementation of the present NIP for the management of POPs has been made, detailed in Annex 3.

3.6.1. Financial cost of the minimisation and neutralisation of pesticides and pesticide warehouses

Different pesticide disposal and destruction methods exist, which explains the various processes and facilities, and their different construction and operating costs.

Table 64 presents the destruction options under consideration, with a more detailed review in Annex 4.

Options	Collection, transportion, neutralization of warehouses, cleaning up of sites, BGN/t	Operating costs BGN/t	Total, BGN/t t	Total OP,	Total treat-ment costs, BGN	Plant construc-tion costs, BGN	Total costs, BGN	Total costs US $ Exchange rate 1 US$ = 1.6 BGN
Destruction of Obsolete pesticides by five methods								
– Incinerator 1000 kg/h	680	1030,4	1710	7011	11988810	10345000	22333810	3958631
– Incinerator 300 kg/h	680	840,85	1521	7011	10663731	6808600	17472331	10920206
Physicochemical treatment	680	3067,8	3748	7011	26277228	8868100	35145328	21965830
– the Balbok AD company	234	1000	1234	7011	8651574		8651574	5407233
- incineration abroad	234	5800	6034	7011	42304374		42304374	26440233
- incineration abroad of OP stored in 477 unrepaired warehouses	234	5800	6034	2308	13926472		13926472	8704045
- incineration abroad of OP stored in unrepaired warehouses of bad status	234	5800	6034	1223	7379582		7379582	4612238
Neutralisation of Obsolete pesticides from BB cubes by three methods								
– Incinerator 1000 kg/h	427	1030,4	1457	4211	6135427		6135427	3834642
– Incinerator 300 kg/h	427	840,85	1268	4211	5339548		5339548	3337217
Physicochemical treatment	427	3067,8	3495	4211	14717445		14717445	9198403

3.6.2. Financial costs to minimise and neutralise PCBs in equipment

There are different methods for disposal and destruction of PCBs in equipment. The PCBs destruction technologies differ depending on the method chosen , which explains the various processes and plants, and their different construction and operating costs. Table 65 presents the destruction options under consideration, with a more detailed review in Annex 4.

Table 65 Comparison of methods for neutralisation equipment and oils containing > 50 ppm PCBs

Options	Collection, transporting, draining of oil, untwining, crushing and scrapping, levs/t	Operating costs BGN/t	Total BGN/t	Total quantity of transformers/ capacitors, and oils/t	Total treatment costs, BGN	Plant construction cost, BGN	Total costs, BGN	Total costs US $ Exchange rate 1 US$ = 1.6 BGN
Disposal/distruction of equipment and oil containing > 50 ppm of PCBs								
Physico-chemical destruction + incineration	270	150	420	7955	3341100	15290800	18631900	11644937
Disposal abroad	375	2925	3300	7955	26251500		26251500	16407188
Disposal abroad of waste transformer oils	375	2925	3300	9,88	32604		32604	20378
Disposal abroad of 614 phased out capacitors	375	2925	3300	1400	4620000		4620000	2887500

3.6.3. Financial costs to minimise and eliminate POPs in emissions

Regarding the costs necessary for the minimization of POPs in emissions, and the need for specific data and different equipment prices for each particular case, no examples are available, but Annex 3 considers the existing processes for reduction of POPs in emissions.

3.6.4. Financial costs for soil remediation and polluted sites decontamination

Table 66 presents a review of several different processes applicable for the treatment of sites polluted with pesticides. They are presented in more detail in Annex 3.

Table 66 Comparison of existing processes for treatment of sites polluted with pesticides

Process	Cost (per square yard)[1]	Treatment period (months)[2]	Treated medium[1]	Efficiency of removal[1]
Low-temperature desorption	100-400 $	0.75	soil, mud, sludge	82-98%
Incineration	300-1000	1	soil, mud, sludge	>99.8%
Biological restoration	8.4-197	3.1 (ex situ)	soil, mud, sludge, and groundwater	up to 99.8%
Phytorestoration	approximately 80 or 60000-10000 $/acre	no data	soil, mud, sludge, and groundwater	80%

[1] *for treatment of pesticide polluted environments*
[2] *for treatment of 1,000 cubic yards of soil polluted with various organic substances*

3.6.5. FINANCIAL COSTS FOR CONTROL AND MONITORING LABORATORIES

The funds necessary to construct laboratory infrastructure, monitoring, and constant control of POPs in Bulgaria vary widely due to the direct dependency on the number of laboratories. However, funds have been provided for and are presented in POPs specific AP. The funds required for a lab to be equipped with necessary technics amount in average 2,5 - 3 million US $.

3.6.6. ALTERNATIVE SOURCES OF FINANCING

The sources of financing are presented for each particular case in the 'proposed funding sources' section of the Specific action plans for each POPs category.

3.6.7. REQUIRED FUNDS TO IMPLEMENT THE NIP FOR POPS IN BULGARIA

Based on the measures and activities envisaged in the NIP for the management of POPs, a preliminary assessment of the funds required for the successful implementation of NIP has been performed. The total budget required to implement all activities planned under the NIP exceeds 50 millions BGN (approx. 30 millions US $), excluding the costs needed for the construction of the National centre for treatment of hazardous waste (87 million BGN) and lab infrastructure for DIOX/Fs determination in environmental media (approx. 6 million BGN).

To implement the most urgent activities related to reduce the negative impacts of POPs on human health and the environment , the Republic of Bulgaria requires funds amounting to 27 455 000 BGN (approx. 17 069 000 US $). The state budget could cover about 10%, mostly as contribution in-kind, providing necessary experts support, offices, technics (computer and copy equipment), communications (Internet, telephone, fax, mail services), office supplies, etc.

The Republic of Bulgaria can not cope alone with final solving of POPs and to meet the full incremental costs of NIP enforcement without international financial support, due to limited national funding available and the fact that Bulgaria is in Currency Board. To reduce the risk of POPs stockpiles impacts on human health and the environment urgent measures should be taken for safe storage and/or environmentally sound disposal abroad, due to absence of appropriate disposal facility in the country. For this purpose the Republic of Bulgaria needs to be supported by providing financial resources from GEF and other international, bilateral, regional and multilateral twinning programmes.

The Republic of Bulgaria requires urgently funding amounting to 21,7 million BGN (approx. 13,6 million US $) for the following activities:

- For carrying out a detailed inventory and disposal abroad of 2308 t obsolete pesticides stored in 477 unrepaired operating warehouses - 14,7 million BGN (approx. 9,2 million US $)**;**
- For carrying out a detailed inventory of PCBs equipment and wastes, containing PCBs and disposal abroad of 844 phased out PCBs capacitors and 20,12 t waste transformer oils, containing PVBs - 7 million BGN (approx. 4,4 million US $)**.**

For the implementation of the NIP for the management of POPs, it should endeavour to provide financial resources by attracting investments on international and national source funding scale, as well as to promote taking measures by the enterprises' operators, intentionally or unintentionally producing and/or using POPs [construction of facilities for treatment and destruction of POPs, introducing the best available techniques (BAT) & the best environmental practices (BEP), etc.

To enable Bulgaria fulfill its obligations under this Convention to meet the full incremental costs of NIP enforcement, potential financial resources to implement the measures set up in POPs Action plans shall be searched by attracting international financing by promotion of multiple-source funding approaches & arrangements, twinning programs and through other bilateral, regional and multilateral sources and channels . Efforts shall be put to use the existing financial mechanism for providing funding from Global Environment Facility (GEF) and bilateral, regional and multilateral finance resources. Project proposals on persistent organic pollutants shall be developed with priority and MoEW shall apply for providing funding by GEF.

Ministry of Environment and Water

Natonal Implementation Plan for Management of POPs in the Republic of Bulgaria

"TO PRESERVE THE NATURAL HERITAGE OF BULGARIA AND TO ASSURE A HEALTHY ENVIRONMENT FOR THE POPULATION"