



The Democratic People's Republic of Korea

**National Implementation Plan
for the Stockholm Convention
on Persistent Organic Pollutants**

Pyongyang

July 2008

Acknowledgements

are due to the Global Environment Facility, the United Nations Development Programme, the United Nations Industrial Development Organization and the United Nations Institute for Training and Research for their financial and technical assistance in developing this document.

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Foreword

The Democratic People's Republic of Korea (DPR Korea), setting it as one of the fundamental principles of its activities to protect human health and environment, and promote the well-being of the people, makes all efforts to meet the requirements of the Stockholm Convention on Persistent Organic Pollutants (POPs).

In hastening the cause of building a powerful socialist nation, it is one of the supreme national tasks to prevent the deterioration of environment caused by the production, use and releases of various harmful chemicals, and to protect human life and health by every means possible.

The DPR Korea, conscious of the need for global action on POPs, acceded to the Stockholm Convention on POPs on August 19, 2002 and endeavors to meet the obligations under the Convention, including the preparation of the National Implementation Plan (NIP).

The NIP is a comprehensive document that shows the current weakness in the management of POPs and sets forth the strategies, measures and activities for improving the situation in the country. The NIP will form the basis for the comprehensive chemicals management to implement the "Strategic Approach to International Chemical Management" (SAICM), by strengthening the national chemicals management system

The NIP will raise the social awareness on the adverse effects of POPs and their safe management, and facilitate the inter-sectional linkages and cooperation in the field of production and use of chemicals. Furthermore, it will further develop international cooperation in chemicals management to protect human health and environment.

Within the framework of Enabling Activity for preparation of the POPs NIP for the implementation of the Stockholm Convention in DPR Korea, the NIP development team was established, involving officials and professionals from various ministries and agencies including the Ministry of Chemical Industry, the Ministry of Land and Environment Protection, the Ministry of Public Health, the Ministry of Agriculture and the Ministry of Machine Industry. The team prepared the NIP under the coordination of the National Coordination Committee for the Environment (NCCE).

The preparation of the NIP commenced with the inception workshop, held in January 2006, on POPs enabling activity.

The NIP development team has prepared the NIP through comprehensively assessing the existing legislation, the ministries and government agencies' responsibilities and roles, regarding chemicals management, and the state of POPs production, import, export, use, waste and contamination.

The following agencies have been involved and/or cooperated in developing the NIP:

*The National Coordination
Committee for the Environment*

The State Planning Commission

The Ministry of Chemical Industry

*The Ministry of Land and
Environment Protection*

The Ministry of Public Health

The Ministry of Agriculture

The Ministry of Machine Industry

*The Ministry of Electric Power
Industry*

The Ministry of Metal Industry

The Ministry of City Management

*The Ministry of Construction and
Building-materials Industry*

The Ministry of Labor

The Ministry of Finance

The Ministry of People's Security

The Ministry of Railways

*The Ministry of Land and Marine
Transport*

The Ministry of Foreign Trade

The Ministry of Education

The Central Statistics Bureau

*The National Quality Supervision
Bureau*

The General Customs Bureau

The Academy of Sciences

The Academy of Medical Science

The Academy of Agricultural Science

Executive summary

Aware that POPs pose a major threat to the human health and the environment, the need for international action including a global legally-binding instrument for reducing or eliminating releases of POPs was recommended by the Governing Council of the United Nations Environment Programme (UNEP), resulting in the adoption of the “Stockholm Convention on Persistent Organic Pollutants” on May 23, 2001.

The DPR Korea became a party to the Stockholm Convention on August 19, 2002 and has prepared the NIP for its implementation. The NIP is a document of comprehensive and strategic policy aiming at establishing the most reasonable system of POPs management in conformity with the governmental policy on sustainable development to ensure the protection of human health and environment.

The NIP implementation will enable the government of the DPR Korea to meet its obligations under the Stockholm Convention to phase out POPs production and use, reduce or eliminate their releases, and develop strategies for safely managing contaminated areas, thus contribute to confronting the threats POPs pose to human health and environment both in the country and globally.

In preparing the NIP, assessment of the national POPs infrastructure, developing inventories and setting of priorities and management options, as well as formulating action plans, have been a favorable opportunity for reviewing the government’s capacity to implement the international conventions on chemicals management.

The primary POPs issue in the DPR Korea is the continuation of production and use of POPs that includes DDT and hexachlorobenzene (HCB) used in health, agricultural, forestry and industrial areas, and polychlorinated biphenyls (PCBs) in various sections of industry. Owing to the measures taken by the government in view of the adverse impacts of POPs on human health and environment, the production and use have been significantly reduced. However, the demand of consumers for POPs has not been reduced due to several reasons including the lack of substitutes. In the period of 1997 - 2006, the annual average productions of DDT, HCB and PCBs were approximately 195 tons, 1 070 tons and 412 tons respectively.

Though the production and use of POPs may be required at its current level of development, one shall never lose sight of their hindrances to human health and environment. In particular, the wide use of DDT and HCB should be re-considered due to their residual quantities in food and feed stuff. The production and use of PCBs also requires due attention, hence projects relating to dismantling the existing production plants shall be among the main priorities.

Releases of unintentionally produced POPs are another major problem to be urgently addressed in the DPR Korea. A significant quantity of dioxins and furans are released from burning of wastes, metallurgical industry, burning of fossil fuels, production of building materials, etc. and a preliminary estimate of their releases has been done.

In the DPR Korea, the infrastructure for implementation of laws and regulations regarding environment protection has been established. The typical relevant laws and regulations related

to environment protection are as follows:

Law on Environmental Protection

Law on Waste Treatment

Law on Agricultural Chemicals

Law on Foodstuff Hygiene

*Law on Protection of Taedong River
from Contamination*

*Law on Sanitation and Quarantine at
Borders*

Law on City Management

Law on Customs

Law on Public Hygiene

*Regulation for the Enforcement of the
Law on Environment Protection*

Law on Agriculture

*Regulation for the Enforcement of the
Law on Environmental Impact
Assessment*

*Law on Management of the Capital City
of Pyongyang*

Law on Prevention of Sea Pollution

*Regulation for the Enforcement of the
Law on Agricultural Chemicals*

*Law on Environmental Impact
Assessment*

Regulation of Handling Toxic Materials

Law on Land

*Regulation for the Enforcement of the
Law on Prevention of Sea Pollution*

Law on Water Resources

*Regulation for the Enforcement of the
Law on Waste Treatment*

Law on Fishery

The ministries and other state organs are responsible for the execution of these laws and regulations within their mandate.

However, a comprehensive legislation addressing production and use of POPs has not been adopted yet. The network for monitoring toxic chemicals has been established, but without sufficient capacity to cope with and fulfill its task.

In the DPR Korea, various activities have been conducted to improve the chemicals management, and health and environment protection. The most notable activities are the Spring and Autumn Month-long Campaigns for Land and Environment Protection and the Hygienic Month-long Campaign organized as annual mass movements, which have proved to have great significance in improving the conditions of public health and environment in the country.

To better the chemicals management, the government is planning to properly understand and control the production, supply, import, export and use of chemicals in the country, paying a great national concern to this area. Especially, it is being importantly planned to provide a

scientific and technical guarantee for the safe chemicals management by involving all the relevant agencies including scientific research institutes having the capacity of analyzing and assessing chemicals.

In cooperation between the government agencies, research institutes and factories have partially been undertaken the activities of improving the chemicals management including the contamination situation. Research and development (R&D) programs regarding the improvement of the chemicals management, developing safe technical options of chemicals production and reduction of chemicals toxicity have been progressing in national research institutes, such as the Academy of Sciences, the Academy of Agricultural Science, the Environment Protection Research Institute and the Hygienic Research Institute, and the Industrial Technology Research Centers of industrial complexes and factories. However, the shortage of technical forces and equipment results in shortcomings in various R&D activities related to the management of chemicals, especially POPs.

Recognizing the importance of international cooperation in chemicals management including POPs, the DPR Korea has ratified several international legally-binding instruments such as “UN Convention on Biological Diversity” (October 26, 1994); “UN Framework Convention on Climate Change” (December 5, 1994); “Vienna Convention on Protection of the Ozone Layer” (May 6, 1995); “Montreal Protocol on Substances that Depletes the Ozone Layer” (May 6, 1995); “Stockholm Convention on Persistent Organic Pollutants” (August 19, 2002); “Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade” (February 6, 2004); “Kyoto Protocol” (April 27, 2005). True to its commitments to these agreements, the government has completed or is developing and implementing technical cooperation projects, and planning a wider range of cooperation programs.

In the DPR Korea, various activities have been undertaken to raise the level of awareness of adverse effects of toxic chemicals including POPs and their safe treatment. Regular education programs on labor protection, especially in the field of chemicals production, are carried on among industrial workers, and awareness raising campaigns on POPs for the general public has been promoted as well. TV programs on the safe chemicals management including POPs have been prepared and broadcasted, and various kinds of information literatures have been published and distributed. However, the activities of collecting, analyzing and distributing information have not been conducted systematically and continuously, which necessitates developing a project to fill the gap mentioned above.

In accordance with the national policy on environment protection, the government of the DPR Korea will be more deeply concerned for improving the chemicals management and is now developing a program to support this activity. It has been agreed that a special training program for professionals, who could be involved in improving the chemicals management including POPs, should be established at university or college education level. In addition, the government agencies and related institutions have preliminarily agreed that they should identify and select officials to be trained.

Building on the above-mentioned description, the overall national goals in the POPs management have been set as follows:

- To establish and complete a comprehensive and sound national regulatory and administrative system that will facilitate the reduction of adverse effects of POPs on human health and environment to the minimum.
- To reduce and phase out the production, use and release of POPs
- To legally, administratively and technically guarantee that POPs sources do not reproduced and their adverse effects do not recur.

Through several trainings, consultations and field surveys conducted in June ~ October, 2006, the criteria for prioritizing activities of the POPs management have been developed, in accordance with which the priority activities have been categorized as follows:

- Establishment of legal and administrative system, public awareness raising
- Strengthening technical and institutional capacity to deal with POPs issues
- Phasing out PCBs production and use
- Phasing out POPs pesticides production and use
- Reducing releases of unintentionally produced POPs
- Environmentally sound disposal of POPs stockpiles and waste, and articles in use containing POPs
- Remediation of contaminated sites in an environmentally sound manner.

Based on the necessity to improve POPs management and the assessment of the situation of chemicals management, a national strategy for POPs management has been prepared, national priorities have been assessed and their nine detailed action plans have been prepared. The action plans have been prepared to achieve progress in implementing the priority actions to meet the obligations of the Stockholm Convention in the DPR Korea within the period ending by 2015 in line with the Decision SC-3/8 of the Third Session of the Conference of the Parties.

The financial resources for improving POPs management have also been considered and assessed in two aspects, that is, both national and international. The national resources have been identified in the state budget, the budgets of ministries and agencies, financial and technical cooperation between ministries or economic sectors, and scientific and technical cooperation between research institutes and/or producers. The international resources have been identified in technical and financial cooperation with related International Organizations and Non Governmental Organizations, and bilateral cooperation between nations. During the discussions between relevant agencies, it has been discussed on the measures to actualize the identified possible technical and financial resources. For the period of 2009-2025 the financial resources requirements for incremental costs have been estimated at US\$ 119.1 million.

Though the POPs related issues are great challenges to be dealt with over a long period of time,

the government of the DPR Korea is firmly determined to improve the POPs situation in the near future, thus contributing to the improvement of environment at a national, regional and global level, and fulfilling its commitments to the Stockholm Convention.

Under the correct policy of the government of the DPR Korea, making all endeavors for the promotion of health and environment protection, the POPs related issues will be settled positively contributing to human health and environment protection as well as to the overall economic development and the improvement of the people's livelihood.

1 Introduction

1.1 Overview of the Stockholm Convention

Chemicals encompass substances of man-made and natural origin and are increasingly used in the agricultural, industrial, and consumer sectors of all societies. While indispensable for economic development, increasing evidence suggests that chemicals and products containing chemicals can pose adverse, harmful effects to health and environment at various stages during their life cycle from production, import, use to disposal, as well as resulting from their unintended occurrence. Such problems include pollution generated during production processes, improper handling, storage and transport accidents, occupational accidents, diseases, and environmental contamination due to unsound disposal methods.

In developing countries, such problems are often associated with the use, and management, of pesticides and industrial chemicals in the agricultural and industrial sectors. Furthermore, in many countries chemicals of natural origin may also give rise to adverse health impacts in various segments of society.

It is now widely recognized that chemicals have to be managed in an environmentally sound manner in order to achieve sustainable agricultural and industrial development and high level of human health and environment protection. In particular, a group of chemical substances called persistent organic pollutants is of major concern.

In conformity with the global recognition to eliminate POPs that pose major and increasing threats to human health and environment, the Stockholm Convention was adopted, focusing on reducing and, where appropriate, eliminating releases of 12 POPs of international concern. These 12 POPs include aldrin, chlordane, DDT, dieldrin, dioxins, endrin, furans, hexachlorobenzene, heptachlor, mirex, PCBs and toxaphene. The Stockholm Convention was adopted at a Conference of Plenipotentiaries on May 23, 2001 in Stockholm, Sweden, by 92 States and the European Community.

The Convention provides Parties with basic objectives, principles and elements for use in developing comprehensive programs and control regimes for addressing their obligations with regard to POPs. The Convention is structured to address POPs that are: (i) intentionally produced, such as pesticides (insecticides, fungicides, etc) and industrial chemicals (PCBs); (ii) intentionally produced and used pesticide for disease vector control, for example for malaria control (DDT); and (iii) produced and released unintentionally as the result of human activity. POPs substances are listed in annexes A-C of the Convention. Annex D of the Convention describes information requirements and screening criteria for including additional chemicals to the Convention. Control provisions for POPs stipulated in the Convention are given in three key articles: Article 3 addresses intentionally produced POPs; Article 5 pertains to POPs generated unintentionally; and Article 6 covers stockpiles and waste of the twelve POPs.

1.2 Overview of POPs issue

1.2.1 POPs pesticides

Effects of POPs pesticides on health and environment

POPs pesticides, their residues and break-down products can be found as pollutants all over the globe. Being semi-volatile, they are transported over long distances. This volatility is greater in tropical than in moderate or cold climates, and they eventually deposited in the coldest parts of the planet. They are thus bio-accumulated in organisms in the Arctic area of high latitudes, where few if any pesticides have ever been used. Such bio-accumulation detected in breast milk has remained unchanged or has even increased in regions where pesticides use was banned decades ago.

The persistent nature of POPs pesticides is well demonstrated by their slow rate of degradation in soil, particularly in cold climates. Their half-life sometimes extends over more than a decade. Several metabolites of POPs pesticides are also stable and even more toxic than the parent molecule.

Another property of these compounds is their solubility in fatty substances and tissues, which leads to their accumulation in body fat. Concentrations of POPs will further be magnified and will increase hundreds of times through food chain. Even low levels of POPs in the environment can cause disturbances to organisms. Studies on predatory birds, aquatic mammals and laboratory rodents have shown adverse effects such as immunotoxicity, carcinogenicity and reproductive disorders. Residue levels in extensive faunal samples in Europe up to 1973, and in Africa up to 1995 have been compared. The levels in Africa were in most cases higher than they were in the industrialized countries where restrictions were initiated in the 1970s.

Although all POPs pesticides are toxic to humans, the acute toxicity varies - endrin being the most toxic, while others such as heptachlor and HCB are less acutely toxic. Acute toxicity is a property of POPs pesticides that they share with other pesticides. Many insecticides and nematicides of the organophosphate and carbamate groups have much higher acute toxicity than that of the POPs pesticides. The decisive criteria for compounds to be included on the POPs list have been, however, their persistence, bio-accumulation and potential for long-range environmental transport, and consequently, their long-term toxicity or ecotoxicity.

Chronic adverse effects of pesticides on human health, due to prolonged periods of exposure, were first recognized in the 1960s. Several of the POPs pesticides are carcinogenic in experimental animals and therefore are possibly carcinogenic to humans. Some are also suspected to depress the immune system. More recently, the health hazard presented by prolonged low-level exposure has become a matter of concern. There is a suspected link to disruption of endocrine system, whereby pesticides block normal hormonal activities.

The use of POPs pesticides

Starting in the early 1970s, one country after another restricted or banned the production and use of POPs pesticides. The production and use of DDT for public health applications (disease vector control) has remained the only acceptable purpose. The last known applications for each of the POPs pesticides are summarized in the table below, which provides some insight for what purposes the POPs pesticides have been used.

Table 1-1: Examples of last known applications of POPs pesticides

POP pesticide	Last known applications
aldrin	Control of termites and other soil pests, termites attacking building materials, grain storage and vector control
chlordane	Control of termites and other soil pests, termites attacking building materials
DDT	Control of medical and veterinary vectors, such as malaria-transmitting mosquitoes, plague-transmitting fleas and trypanosomiasis-transmitting tsetse flies
dieldrin	Control of locusts, termites, human disease vectors
endrin	Formerly used against insects and rodents. No current or recent use is known
heptachlor	Control of termites and other soil pests, termites attacking building materials
HCB	Seed treatment against fungal diseases, as well as for industrial purposes
mirex	Control of leaf-cutting ants, termites in buildings and outdoors, fire retardant and for other industrial purposes
toxaphene	Control of insect pests in cotton and other crops

Production and use of the pesticides listed as POPs has, for all practical purposes, already ceased in high-income countries, except for a few products for termite control. Their use in low-income countries has also been reduced, often because of growing trade restrictions on agricultural products containing pesticide residues. DDT and possibly a few other POPs pesticides are, however, still used in a number of developing countries. DDT is mainly used for the control of malaria vectors, chlordane and heptachlor used for termite control.

1.2.2 PCBs

Properties of PCBs

The synthesis of PCBs was first described in 1881 and commercial production began in the late

1920s. Applications of PCBs in some products ceased in the mid- 1970s, but they continued to be used in transformers, capacitors, heat exchangers and hydraulic equipment. It has been estimated that 1 million tons of PCBs have been produced throughout the world since 1930. Unfortunately, a considerable proportion of this amount has entered the environment and there is concern about the long-term effects of these compounds.

PCBs are a family of organic chemicals consisting of two benzene rings linked by a carbon-carbon bond. Chlorine atoms are substituted at any or all of the ten remaining available sites. The number and position of these chlorine atoms determine the classification and properties of the different molecules. There are 209 possible congeners of PCBs. The volatility of the different molecules varies with the degree of chlorination. In general, congeners with low chlorine content are free-flowing liquids, becoming more viscous and less volatile as the chlorine content increases. Commercial preparations usually contain a mixture of congeners and are categorized by the chlorine content. Around 130 congeners have been identified in commercial mixtures. It may be noted that, besides electrical transformers and capacitors, PCBs have also been used for various other applications: varnishes, waxes, synthetic resins, epoxy and marine paints, coatings, cutting oils, heat transfer fluids, hydraulic fluids, etc.

PCBs are among the most stable organic chemicals known. Their low dielectric constant and high boiling point make them ideal for use as dielectric fluids in electrical capacitors and transformers. However, the disadvantages of PCB fluids are now seen considerable, since they are non-biodegradable, persistent in the environment, able to accumulate in fatty tissues in the body, and suspected of being carcinogenic.

The effects of PCBs on humans can be serious:

- leading to failure of kidneys and other human organs;
- producing headaches, sickness, etc., if inhaled; and
- causing chlor-acne if absorbed through the skin.

Electrical equipment and PCBs

PCB oils were initially proposed as dielectric fluids for use in electrical equipment such as transformers, capacitors, circuit-breakers, voltage regulators, etc. because of their excellent dielectric properties and also because of their very low flammability. PCB oils can absorb rapid changes in electric fields with very little heating up, i.e. with very little loss of energy. PCBs are also stable in changing temperatures and they only burn if placed in contact with an open flame.

When PCBs do burn, for example if a transformer or capacitor is present in a factory or domestic fire, very toxic chemicals are formed. In particular, these are dibenzofurans whose deleterious effects on health have been well demonstrated. Apart from the danger of PCBs producing furans in the case of fires, PCBs themselves are dangerous substances because of their great stability, and their oleophilic nature, which means that they are easily absorbed by the fatty tissues of humans and animals. PCB concentrations can then build up in the body, for example in the fat, the liver etc., and it is very difficult to mobilize and eliminate these

molecules.

Equipment such as transformers, capacitors and to a lesser extent heat-exchangers and hydraulic equipment may contain PCBs or fluids with varying levels of PCBs. For example, PCBs may be found in hermetically sealed capacitors ranging in size from those fitted to fluorescent lights, containing a few grams of PCBs to high voltage units containing up to 60 kg of PCB liquid. Capacitors contain the lower chlorinated congeners of PCBs, which are therefore more volatile.

PCBs applications were gradually banned in electrical equipment from the early 1980s in some countries. It may be assumed that equipment manufactured before 1986 may contain PCBs. A very large number of transformers exist today which still contain PCBs, and the challenges are first to identify and label such equipment, and then to select the most appropriate steps to remove them from use and dispose the PCBs they contain.

1.2.3 Unintentional POPs

Dioxins and furans, more precisely polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF), together with PCBs and HCB are listed in Annex C of the Stockholm Convention; they are unintentionally generated and are commonly named “by-products”.

PCDD/PCDF formation routes can be grouped into two broad categories: (i) formation in thermal processes and (ii) formation in industrial-chemical processes. They are persistent in the environment and their transfers can occur between different environmental media. Such transfers may be important for human exposure or may impact the environment. The PCDD/PCDF releases per year will be calculated and presented in grams of toxic equivalents (TEQ) per year.

Table 2-1: Land in use in 2005

Description	Unit	2005
Forest	km ²	89 273
Agriculture	km ²	20 421
Industry	km ²	2 063
Water	km ²	7 374
Residence	km ²	1 659

The total population in the DPR Korea was 23 756 000, of which the female numbers 12 177 000 and the male 11 579 000, with the average life expectancy of 68.8 in 2005.

Table 2-2: Population

Description	Year				
	1990	1993	1996	1999	2005
Total population (in 1 000)	20 960	21 213	22 114	22 754	23 756
Average life expectancy (in years)	74.0	72.7	70.1	66.8	68.8

2.1.2 Political profile

The DPR Korea is an independent socialist state representing the interests of all the Korean people. It is guided by the Juche idea, which is the man-centred world outlook and a revolutionary idea to achieve the independence of the popular masses.

The national sovereignty rests with the workers, peasants and intellectuals, and all other working people. All the state organs are organized and operated on the principle of democratic centralism.

The DPR Korea conducts all activities under the leadership of the Workers' Party of Korea.

Independence, peace and friendship are the ideals underlying the nation's foreign policy and the principle of its external activities.

The Supreme People's Assembly is the highest state organ of authority. It exercises legislative power. It is composed of deputies elected on the principle of universal, equal and direct suffrage by secret ballot. It is elected for a term of five years.

The National Defence Commission is the highest military leadership body of state power and

the organ charged with overall administration of national defence. The Chairman of the National Defence Commission of the DPR Korea commands and directs all the armed forces and guides national defence as a whole. The National Defence Commission is accountable for its work to the Supreme People's Assembly.

The Presidium of the Supreme People's Assembly is the highest organ of state power when the Supreme People's Assembly is not in session. The President of the Presidium of the Supreme People's Assembly represents the state and receives the credentials and letters of recall of diplomatic representatives accredited by foreign states.

The Cabinet is the administrative and executive body of the highest state power and the organ of overall state administration. The Premier of the Cabinet represents the government of the DPR Korea. The Cabinet is accountable for its work to the Supreme People's Assembly and to the Presidium of the Supreme People's Assembly when the Supreme People's Assembly is not in session.

The people's assembly of the province (or municipality directly under central authority), city (or district) and county is the local organ of state power, with the term of office of four years. The local people's committee is the local organ of state power when the people's assembly at the corresponding level is not in session and the administrative and executive organ of state power at the corresponding level. It is accountable to the corresponding people's assembly and is subordinate to the people's committees at higher levels and the Cabinet.

2.1.3 Economic profile

The DPR Korea is a socialist industrial state with an independent national economy relying mainly on its own technologies and resources. The state property and property of social and cooperative organizations are the economic foundation of the country. Under the socialist system where the people are invested with the state power and the means of production, it is the supreme principle of state activities to steadily improve their material and cultural standards.

In the DPR Korea, GDP was US\$ 20 875 million in 1992, but it decreased to US\$ 10 588 million due to natural disasters in 1996.

Table 2-3: Economic profile

Description \ Year	1992	1994	1996	2004
GDP (in million US\$)	20 875	15 421	10 588	12 859
Industry (%)	37.6	41.7	45.1	47.3
Agriculture (%)	21.8	20.9	14.7	18.4
Construction (%)	6.3	5.9	4.8	5.4
Others (%)	34.3	31.5	35.4	28.9

Description	Year			
	1992	1994	1996	2004
Total exports (in million US\$)	962	896	756	
Total imports (in million US\$)	1 207	1 060	998	

In the DPR Korea, the major industrial sectors are power industry, coal industry, metallurgical industry, railway transportation, mining industry, building-materials industry, and chemical and light industries, mainly relying on domestic natural resources.

The industrial output increased by 196 times in 1977, 431 times in 1984 when compared with 1946, and 1.5 times in 1993 as against 1986. The high economic growth was accompanied by the increased energy demand.

Of GDP, the share contributed by industrial sectors such as iron and steel, chemicals, cement, machine manufacturing, power generation, and construction, etc amounted to 37.6% in 1992 and 45.1% in 1996.

Table 2-4: Main industrial production

Products	Unit	1990	2000	2004
Coal	10 000 tons			2 456
Power	100 million kWh	564	307	355
Steel	10 000 tons	712	161	178
Fertilizer	10 000 tons	226.5	17.0	27.6
Cement	10 000 tons	1 390	197	317

In the DPR Korea, the chemical industry has a history of around 60 years. Major chemical industry areas are South and North Hamgyong Provinces, and South and North Phyongan Provinces, in which are located large or small/medium-sized chemical factories producing various kinds of chemicals including inorganic and organic compounds, and nitrogen compounds.

The major products are fertilizers, pesticides, synthetic resin, paints, dyes, plasticizers, acids, alkali and synthetic pharmaceuticals, as well as DDT, HCB and PCBs, the POPs listed in the Stockholm Convention. Most of those chemicals are distributed in the country but they are not sufficient to meet the domestic demand.

In the DPR Korea, agriculture is one of the two major sectors of the economy and plays an important role in developing the national economy and improving the people's livelihood. The

major crops are rice and maize. Other crops are wheat, barley, kaoliang, beans, etc.

The share of the agricultural sector in GDP decreased from 21.8% (in 1992) to 14.7% (in 1996) due to continued natural disasters such as flooding, drought and tidal waves. In 1990, the total crop yield was 9.1 million tons, of which rice and corn outputs amounted to 4.5 million tons and 3.9 million tons, respectively.

The tables below show the land use state and the output volume of main crops.

Table 2-5: Agricultural land in use

Description	Unit	1996	1998	2000	2002	2006
Sown area						
Rice	1 000 jongbo ¹	580	579	535	583	583
Corn	1 000 jongbo	589	593	496	497	495
Wheat & barley	1 000 jongbo		28	123	127	136
Potato	1 000 jongbo		48	187	188	188
Orchard area						
Apple	jongbo			33 800		
Pear	jongbo			63 300		
Peach	jongbo			22 300		
Grape	jongbo			2 100		

Table 2-6: Output of main crops

Description	Unit	1990	1992	1994	1996	1998	2000	2002	2006
Crop	1 000 tons	9 100	8 800	7 083	2 502	3 022	3 262	4 322	5 254
Rice	1 000 tons	4 500	4 500	3 177	1 426	1 568	1 533	1 979	2 479
Corn	1 000 tons	3 900	3 718	3 547	825	1 175	1 015	1 571	1 965

The other sectors including transport, communication, commerce, trade and finance accounted for 34.3% of GDP in 1992 and 35.4% in 1996.

¹ 1 jongbo = 0.991768 hectare

2.1.4 Environmental overview

The environmental condition of the DPR Korea is clearly affected by its geographical location, hydro-meteorological factors and human economic activities. Global climate changes and occurrence of yellow sand and acid rain caused by economic development in neighboring countries reduced the biodiversity, and contaminated and degraded water resources, land and forest. The currently experienced economic difficulties have just hindered the investment to the environment sector.

Air Pollution

To protect and keep the atmospheric environment clean is a key element of environmental protection. Furthermore, given that air quality remains a vital public issue, it becomes a priority for protecting both people's health and global ecosystem.

In the DPR Korea the major cause of air pollution is the release of gases from fossil fuel combustion in boilers, industrial kilns, vehicles and residential areas, as well as waste gas from industries. Especially, the releases of unintentional POPs, such as dioxins and furans, have attracted a serious attention. In recent years, steps have been taken by the government to remove certain factories and plants emitting pollutants into the atmosphere in Pyongyang and other major industrial cities out of the urban areas or to other districts.

To mitigate air pollution and reduce GHG emissions, the government prepared and has been implementing an energy strategy, of which the main priorities are the improvement of energy efficiency and energy conservation.

Air pollution caused by the growth in population and the industrial development will become a more critical issue. Therefore there is a need for the establishment of an integrated system to monitor the nationwide air quality and to study impacts on human health and ecosystems. It is also necessary to encourage the introduction of modern technologies of recovering energy, coal combustion and exhaust-gas purification in the industrial sector including thermal power plants.

Climate Change

The global warming, one of the most serious global concerns, considerably affects the DPR Korea. In the 1990s, the annual average temperature increased, with the abnormally high temperature in summer 1994, the highest record observed since 1918. The years of 1990, 1995 and 1996 could be regarded as the ones of abnormal rainy conditions and 1997 of serious drought all over the country. In 1995 and 1996, there were heavy rainfalls, inflicting a heavy loss on several sectors of the national economy including agriculture.

The DPR Korea ratified the UN Framework Convention on Climate Change on December 5, 1994 and established the NCCE, attaching importance to cooperation with international organizations. The NCCE has built up a technical group and organized national workshops to assess the climate change and work out practical measures to address climate change issues.

Water quality

The DPR Korea is relatively rich in water resources. However, the increased amount of sewage caused by population growth, industrial effluents, extensive use of pesticides and fertilizers, and immense depletion of water resources adversely affect the water resources and their management. Water pollution also badly harms human health and aquatic and marine ecosystems.

The DPR Korea puts emphasis on the protection and management of water resources, giving priority on sustainable use of water resources in accordance with the economic development, the population growth, and the improvement of living standards and cultural level of people.

The government has strengthened the legal control against the industrial complexes and factories polluting rivers and streams, and conducted activities to raise the public awareness on protection of water resources through mass media including TV, radio, newspapers and magazines. The government also focuses on multilateral and bilateral cooperation with international organizations and other nations in the protection and management of water resources.

Waste treatment

The problem of waste treatment is one of the urgent priority issues to be solved in the DPR Korea. It is known that organic wastes that could be decomposed biologically can be used as fertilizers, but certain pests in wastes may not be eliminated, causing soil contamination. In the DPR Korea are facilitated the activities of developing and implementing a country-wide waste management project to protect soil, water and crops from contamination by waste, strengthening the monitoring capacity required for assessing the possible toxic residues in crop and the degree of land contamination.

Biodiversity

In proportion to the land area of the country, the DPR Korea has an abundant fauna and flora. Among plant species, the rate of native indigenous species is at a high level, where the indigenous plants surveyed up to now cover 315 species of higher vegetation (542 species if varieties and hybrids are included), corresponding to around 10 percent of vascular plant species. Indigenous animals account for 2.9 percent of recorded vertebrates (of which 33 species and varieties of fish are categorized as indigenous).

There are endangered and rare species among animal and plant populations, which are under pressure because of their biological characteristics and loss of habitat. The list for higher vegetation shows 10 endangered species, 42 vulnerable species, 76 rare species and 26 species of populations reducing, corresponding to 4 percent of the country's higher plant species. For vertebrates, there are 9 critically endangered species, 29 endangered species and 119 rare species, accounting for around 11 percent of the country's vertebrate species.

The conservation of biodiversity is a crucial task in the DPR Korea. The overuse of biological resources beyond the level of natural replacement becomes a key factor in biodiversity loss. Then the process of global warming also brings obvious effects to the biodiversity of the DPR

Korea.

The government has been taking some measures for the conservation of biodiversity, such as completion of legal mechanisms for both biodiversity conservation and sustainable utilization; building up of education, training and the necessary information management systems; and facilitating international cooperation.

Forest resources

The degradation of forest resources in the DPR Korea has emerged as the most urgent priority. Abnormal climatic patterns have created a series of natural disasters with avalanche and land loss, resulting in forest destruction and decreases in crop production. Timber lumbering, fuelwood consumption and conversion of forest into farmland are vital causes of forest stock depletion. Another cause of forest stock depletion is the degradation of certain species of trees, such as pine.

The government has developed an afforestation/reforestation program for rehabilitation and amelioration of forest with healthy and sound tree species and makes every effort for implementing it. In this context, enormous endeavors are directed to rehabilitation of forest and enhancement of the conservation function through reforestation with fast-growing and healthy tree species, including Acacia, in the form of a nationwide campaign. The government also attaches great significance to bilateral/multilateral international cooperation for the sustainable development of forest resources, focusing on its implementation.

Land resources

In the DPR Korea, where the area under cultivation is limited, it is of importance to protect land well. The causes of land deterioration are mainly related to forest degradation. The government is taking positive measures for protection of land through reforestation/afforestation, river improvement, and land amelioration and realignment.

In recent years, the nationwide realignment of hundreds of thousands of hectares of land has been completed in keeping with the demands of the new century in the provinces of Kangwon, North Phyongan and South Hwanghae, and Pyongyang, etc, thus laying a solid foundation for sustainable development of the land resources.

2.2 Institutional, policy and regulatory framework

2.2.1 Environmental policy, sustainable development policy and general legislative framework

Environmental Protection and Sustainable Development

The DPR Korea esteems the environmental protection as an important political task and has adopted right policies of protecting environment. In particular, giving definite priority to

environmental protection in conformity with economic growth, the government also puts emphasis on facilitating sustainable development.

- Main principle of environment protection

Environment protection is an important task that should be permanently kept up in the socialist construction. The government consolidates and develops what was achieved in the environment protection and takes measures to protect environment better in line with the development of the relevant economic sectors, while increasing financial investment systematically.

- Principle of environment protection in a planned way

The government, in order to build the environment in conformity with the people's desire and demand, organizes environment protection activities in a planned and systematic way. The government, upon the principle of environment protection, designs and builds cities and villages, and rationally arranges industrial plants, such as factories and enterprises.

- Principle of giving precedence to environment protection measures

It is a primary requirement in environment protection to take the pollution prevention measures ahead of production and construction. The factories and enterprises should conduct activities of production and construction after taking measures of pollution prevention and continually strengthen and update material and technical means of environment protection.

- Principle of environment protection and management involving all people

It is a sacred duty of all people to protect and manage the environment. The government strengthens the education in socialist patriotism among people, to make them love their country and native villages, and voluntarily participate in the environment protection activities.

- Principle of scientific research for environment protection

The government strengthens scientific research activities regarding environment protection from pollution and builds up the capacity of scientific research institutes, strengthening guidance of their activities.

- Strengthening cooperation in the field of environment protection

The government strengthens cooperation with other countries and international agencies in the field of environment protection.

- Developing and implementing sustainable development strategy for environment protection and conservation of resources.

- Energy efficiency and reduction of energy consumption

The energy conservation is one of the priority measures for ensuring environment protection and sustainable development. For this purpose, the government facilitates technology improvement, as well as research and development, and introduction of modern technology. In industrial sectors, they undertake activities of updating technology and equipment consuming much energy or substituting them with new ones. In the sector of commerce and even in the households are facilitated measures for reducing coal and firewood consumption, to be generalized all over the country.

- Facilitating the use of alternative energy

In the DPR Korea most of the primary energy resource is fossil fuel. Therefore, it is a key solution in reducing GHG emission to use resources having no or less number of carbons instead of coal. The government pays a great attention to using natural energy resources, such as solar heat, wind force and hydraulic power. Especially, the government facilitates building of medium or small-sized hydraulic power plants together with large-scale hydraulic power plants.

- Development and protection of environment resources

It is a vital issue in the economic development to develop and use environment resources in an effective and sustainable manner. The government strengthens the control of using and developing environment resources and manages them in a planned way, ensuring the protection and sustainability of environment resources.

- Developing and strengthening environmental laws and regulations

Developing and strengthening the enforcement of laws and regulations poses as a primary issue in building and strengthening the legal basis of environment protection. The government strengthens its control and coordination capacities for environment protection and sustainable development by updating and thoroughly implementing environmental laws and regulations.

Policies, laws and regulations relating to environmental management

By giving the priority to environmental protection over the production in Paragraph 57, Article 3 of the Socialist Constitution Law, the governing law of the State, and reinforcing the sectional legal basis under the Law on Environment Protection, the DPR Korea has directed its prime effort to providing people with cultured and sanitary environment and conditions of labor, and protecting and managing the environment in the country.

- ***The Law on Environment Protection*** (adopted by Ordinance No. 5 of the Supreme People's Assembly on April 9, 1986) puts forward the main principle of environment protection and specifies the principle issues on conservation and building of natural

environment, prevention of environment pollution, and strengthening of control over and guidance on environment protection activities.

- ***The Law on Agricultural Chemicals*** (adopted by Decree No. 1939 of the Presidium of the Supreme People’s Assembly on August 23, 2006) stipulates that the contamination and pollution of environment caused by agricultural chemicals shall be prevented by establishing a strict system and procedures for examination, registration, production, supply, storing and use of them.
- ***The Law on Protection of Taedong River from Contamination*** (adopted by Decree No. 946 of the Presidium of the Supreme People’s Assembly on February 10, 2005) describes the purification of the industrial waste water and sewage, the decontamination and purification of pathogenic polluted water, and the installation of treatment facility.
- The disposal of city waste, the recovery and utilization of useful elements from the waste, and the protection of potable water from contamination is regulated by ***the Law on City Management*** (adopted by Decision No. 14 of the Standing Committee of the Supreme People’s Assembly on January 29, 1992).
- ***The Law on Public Hygiene*** (adopted by Decision No. 123 of the Standing Committee of the Supreme People’s Assembly on July 15, 1998) regulates discharging contaminated material, the operation of disposal facility of infectious and toxic materials, and the management of refuse heaps around public buildings, and stipulates protection of land against contamination caused by infectious and toxic materials.
- It is stipulated in ***the Law on Agriculture*** (adopted by Decree No. 290 of the Presidium of the Supreme People’s Assembly on December 18, 1998) that the material harmful to the agricultural resources and eco-environment in arable land shall be removed in such procedures and formalities as approved.
- ***The Law on Management of the Capital City of Pyongyang*** (adopted by Decree No. 286 of the Presidium of the Supreme People’s Assembly on November 26, 1998) regulates that a complex facility of treating waste shall be built up for disposal of industrial waste.
- The outflow of the agricultural chemicals and the waste water into the sea is prohibited in ***the Law on Prevention of Sea Pollution*** (adopted by Decision No. 99 of the Standing Committee of the Supreme People’s Assembly on October 22, 1997).
- ***The Law on Environmental Impact Assessment*** (adopted by Decree No. 1367 of the Presidium of the Supreme People’s Assembly on November 9, 2005) stipulates the standard practices of environment impact assessment aimed at preventing the destruction of environment and its damages, and preserving clean environment.
- ***The Law on Land*** (adopted by Ordinance No. 9 of the Supreme People’s Assembly on April 29, 1977) points out the treatment of the toxic materials contaminating the land.
- The seas, rivers, lakes and reservoirs of the DPR Korea shall be protected by

strengthening the control of waste water, radioactive substances, toxic materials, and waste in conformity with *the Law on Water Resources* (adopted by decision No. 86 of the Standing Committee of the Supreme People's Assembly on June 18, 1997), *the Law on Rivers and Lakes* (adopted by Decree No. 3436 of the Presidium of the Supreme People's Assembly on November 27, 2002), *the Law on Fishery* (adopted by Decision No. 49 of the Standing Committee of the Supreme People's Assembly on January 18, 1995) and *the Law on Waste Treatment* (adopted by the decision No. 2215 of the Presidium of the Supreme People's Assembly on April 26, 2007).

- *The Law on Foodstuff Hygiene* (adopted by Decision No. 124 of the Standing Committee of the Supreme People's Assembly on July 22, 1998) stipulates the preventing foodstuff from contamination to protect public health, while the import and export of unlicensed contaminated materials shall be banned and controlled according to *the Law on Sanitation and Quarantine at Borders* (adopted by Decision No. 69 of the Standing Committee of the Supreme People's Assembly on January 24, 1996) and *the Law on Customs* (adopted by Decision No. 7 of the Standing Committee of the Supreme People's Assembly on October 14, 1983).
- The government of the DPR Korea has drawn up detailed regulations needed for implementing all of the laws, such as *the Regulation for the Enforcement of the Law on Environment Protection* (adopted on October 23, 1999) and *the Regulation for the Enforcement of the Law on Environmental Impact Assessment* (adopted on April 26, 2006).

The Regulation for the Enforcement of the Law on Agricultural Chemicals (adopted on August 6, 2007), *the Regulation of Handling Toxic Materials* (adopted in February 2006) and *the Regulation for the Enforcement of the Law on Prevention of Sea Pollution* (adopted on December 28, 1997) clarify the approaches and procedures to prohibit and restrict the agrochemicals and chemical agents of harmful effects on the environment and public health.

The Regulation for the Enforcement of the Law on Waste Treatment (adopted on September 19, 2007) regulates the management of the waste, such as radioactive waste, toxic organic waste and common waste.

2.2.2 Roles and responsibilities of ministries and other governmental institutions involved in POPs life cycles

The government agencies related to POPs management include: the NCCE, the State Planning Commission, the Ministry of Chemical Industry, the Ministry of Land and Environment Protection, the Ministry of Public Health, the Ministry of Agriculture, the Ministry of Machine Industry, the Ministry of Electric Power Industry, the Ministry of Metal Industry, the Ministry of City Management, the Ministry of Construction and Building-materials Industry, the Ministry of Finance, the Ministry of People's Security, the Ministry of Railways, the Ministry of Land and Marine Transport, the Ministry of Foreign Trade, the Central Statistics Bureau, the National Quality Supervision Bureau, the General Customs Bureau, the Academy of Sciences, the Academy of Medical science, the Academy of Agricultural Science, etc.

- The NCCE, as being in charge of the Stockholm Convention, coordinates all the activities of relevant ministries and agencies in collecting information on the overall POPs management and taking measures. It is composed of Ministers and Deputy Ministers and reports directly to the Cabinet. The NCCE has a Secretariat that coordinates its work.
- The State Planning Commission makes a plan of production, import, export and supply of chemicals including POPs and takes relevant administrative measures.
- The Ministry of Chemical Industry provides overall guidance on production of chemicals including POPs (DDT, HCB, PCBs) in the DPR Korea. It also takes the responsibilities for the environmentally sound management of not only POPs produced in the factories and industrial complexes under its supervision, but also for overall chemicals management. In addition, it conducts R&D activities of developing alternative materials.
- The Ministry of Land and Environment Protection is responsible for overall environment protection and provides an organic linkage between scientific research, and technical and administrative activities. It also assesses, supervises, monitors and controls the environment pollution by contaminants including POPs.
- The Ministry of Public Health and the Academy of Medical Science take measures for controlling DDT use and application of alternatives. They conduct hygienic monitoring and control of POPs contaminated articles and sites, and study adverse effects on human health by POPs, to find a way to improve the situation.
- The Ministry of Agriculture coordinates the use, export and import of pesticides, including DDT and HCB.
- The Ministry of Machine Industry produces and repairs PCBs-containing equipment (transformers, circuit breakers, heat exchangers, hydraulic equipment).
- The Ministry of Electric Power Industry produces and repairs PCBs containing capacitors.
- The Ministry of Metal Industry, the Ministry of Construction and Building-materials Industry and other relevant government agencies take the responsibility to reduce the POPs release unintentionally caused in the production processes.
- The Ministry of City Management controls the city waste management and takes the measures to reduce the possible unintentional POPs releases below allowable level.
- The Ministry of Finance plans and provides the financial resources needed for the POPs management.
- The Ministry of People's Security monitors and controls the execution of laws and regulations on environment and the overall chemicals management including POPs.

- The Ministry of Land and Marine Transport and the Ministry of Railways ensure the environmentally sound transportation of chemicals including POPs.
- The Ministry of Foreign Trade takes practical measures to limit or prohibit the trade of pollutants including POPs.
- The Central Statistics Bureau collects information on production, import, export, use and waste of chemicals including POPs.
- The National Quality Supervision Bureau registers, works out standard designs of, inspects the quality of and controls the chemicals including POPs.
- The General Customs Bureau controls the import and export of toxic chemicals including POPs.
- The Institute of Agro-chemicals under the Academy of Agricultural Science registers and approves the pesticides and monitors the use and management of pesticides including POPs in the field of agriculture.

2.2.3 Relevant international commitments and obligations

The DPR Korea puts forward the protection of human health and the improvement of people's lives as one of its most important tasks, and hence energetically participates in international activities of environment protection.

The DPR Korea is a party to the Vienna Convention on Protection of the Ozone Layer and its Montreal Protocol as well as the UN Framework Convention on Climate Change and the Convention on Biological Diversity.

The DPR Korea acceded to the Stockholm Convention on Persistent Organic Pollutants on August 19, 2002 in order to protect human health and environment from POPs.

The list below shows the international conventions that the DPR Korea entered.

<i>UN Convention on Biological Diversity</i>	<i>October 26, 1994</i>
<i>UN Framework Convention on Climate Change</i>	<i>December 5, 1994</i>
<i>Vienna Convention on Protection of the Ozone Layer</i>	<i>May 6, 1995</i>
<i>Montreal Protocol on Substances that Depletes the Ozone Layer</i>	<i>May 6, 1995</i>
<i>Stockholm Convention on Persistent Organic Pollutants</i>	<i>August 19, 2002</i>
<i>Cartagena Protocol on Biosafety</i>	<i>July 29, 2003</i>

UN Convention on Combating Desertification

March 28, 2004

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

February 6, 2004

Kyoto Protocol

April 27, 2005

2.2.4 Description of existing legislation and regulations addressing POPs (manufactured chemicals and unintentionally produced POPs)

In the DPR Korea the management of chemicals having impacts on environment are regulated by the laws and regulations listed in 2.2.1. However, specific laws and regulations regarding POPs have not been adopted yet.

2.2.5 Key approaches and procedures for POPs chemical and pesticide management

The government of the DPR Korea has been strengthening the capacity of controlling all the stages involved in the lifecycle of POPs including production, import, export, use and waste treatment.

The management of POPs production is a key issue in the overall POPs management. The government takes measures to prohibit capacity increase of POPs production, preserve the system of reporting on the production volumes and reduce the POPs release below the allowable level in the production plants.

The government enhances the institutional capacity of relevant agencies in order to strengthen the control over the import, export, use and waste treatment and facilitates the integrated guidance and management.

The government includes the POPs issues in the environment mass movement to raise their awareness on POPs and enthusiasm to participate, and makes efforts to monitor the environment contamination by POPs using current environment monitoring system.

The government, giving importance to enhancing technical capacity regarding POPs management, endeavors to strengthen the capacity of research and analysis of existing chemicals-related scientific research and analytical institutes. Especially the preparatory activities for developing POPs alternatives and technical development activities for reducing unintentional POPs emissions are facilitated.

2.3 Assessment of the POPs issue in the DPR Korea

2.3.1 Assessment of Annex A, Part I chemicals: POPs pesticides

Production and use

There are two kinds of POPs pesticides being produced and used in the DPR Korea. They are HCB and DDT. The other POPs pesticides listed in Part I, Annex A of the Stockholm Convention need to be further investigated to identify their status including production, use, import and export.

HCB has been produced by the 2.8 Vinalon Complex, the Suncheon Vinalon Complex and the Hungnam Pharmaceutical Factory. The initial production capacity was 4 500 tons per year at the 2.8 Vinalon Complex and the Suncheon Vinalon Complex, and 500 tons per year at the Hungnam Pharmaceutical Factory. Since 1997, the average production volumes have been dramatically reduced by a large margin as shown in the table below.

In the 1980s, the production volume of HCB reached a maximum level of 4 426.9 tons per year. In 2006, 1 142 tons were produced.

Table 2-7: HCB production

Year	Output (in tons)	Year	Output (in tons)	Year	Output (in tons)
1960s (average)	3 434.8	1998	1 022.0	2003	1 127.8
1970s (average)	4 083.6	1999	1 031.4	2004	1 164.3
1980s (average)	4 426.9	2000	969.7	2005	1 023.2
1990s (average)	2 623.3	2001	1 170.5	2006	1 142.0
1997	882.0	2002	1 174.7		

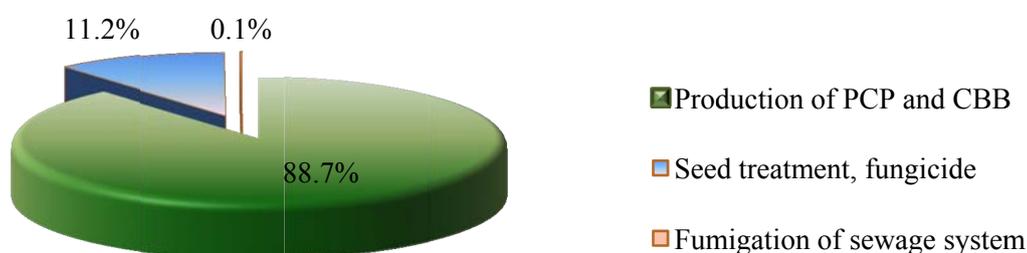
In the DPR Korea, HCB has been used for the production of pentachlorophenol (PCP), an herbicide, and chloro-butoxy-benzene (CBB), a plasticizer. The production capacities are 1 500 tons per year for PCP and 450 tons for CBB.

HCB is also used as fumigant for disease vectors in sewage system in the sector of public health, as well as for seed treatment in agriculture. In addition, it is directly used as fungicide for crops, such as maize, wheat and barley.

Table 2-8: HCB use by each sector

Year	Use	Production of PCP and CBB (in tons)	Seed treatment, Fungicide (in tons)	Fumigation of sewage system (in tons)
1997		801.1	79.5	1.4
1998		892.4	126.7	2.9
1999		901.4	128.6	1.0
2000		859.5	108.4	1.8
2001		1 057.7	111.5	1.3
2002		1 043.9	129.6	1.2
2003		1 010.1	116.5	1.2
2004		1 040.3	121.5	2.5
2005		910.3	111.6	1.3
2006		1 012.8	128.0	1.2

Figure 2-1: Distribution of HCB use by each sector in 2006



Import and Export

As far as it could be established there has been no export of HCB recently in the DPR Korea, and it is presumed that there might have been some import, which has not been fully investigated yet.

Stockpiles and Waste

In the sectors of chemical industry, public health and agriculture, there might be some stockpiles, the exact amount of which could not be estimated because of their irregularity.

HCB waste treatment in the DPR Korea is now being assessed.

2.3.2 Assessment of Annex A, Part II chemicals: PCBs

Production of PCBs

In the DPR Korea, PCBs have been produced by the 2.8 Vinalon Complex and the Sunchon Vinalon Complex relying on domestic materials and techniques since the late 1960s.

The assessment of the production of PCBs in the DPR Korea was conducted in 2006. As a result, the information on the production volumes was collected, which is shown in the table below.

Table 2-9: PCBs production

Year	Output (in tons)	Year	Output (in tons)	Year	Output (in tons)
1960s (average)	277.0	1998	438.8	2003	415.6
1970s (average)	903.0	1999	457.1	2004	443.5
1980s (average)	917.3	2000	448.7	2005	497.4
1990s (average)	500.0	2001	328.2	2006	354.8
1997	307.2	2002	430.2		

In the DPR Korea, the initial production capacity of PCBs was 1 200 tons per year, and there was a tendency for the production to be increased until the 1980s. However, it has been decreased since the early 1990s and the annual average production volume in the period of 2001-2006 has been reduced to 411.6 tons.

PCBs production plants have also produced trichlorobenzene (TCB), the solvent of PCBs, with the annual production capacity of 350 tons.

Use of PCBs

In the DPR Korea, PCBs have been used mainly in industrial sectors. The sectors of PCBs use in the DPR Korea are listed as follows:

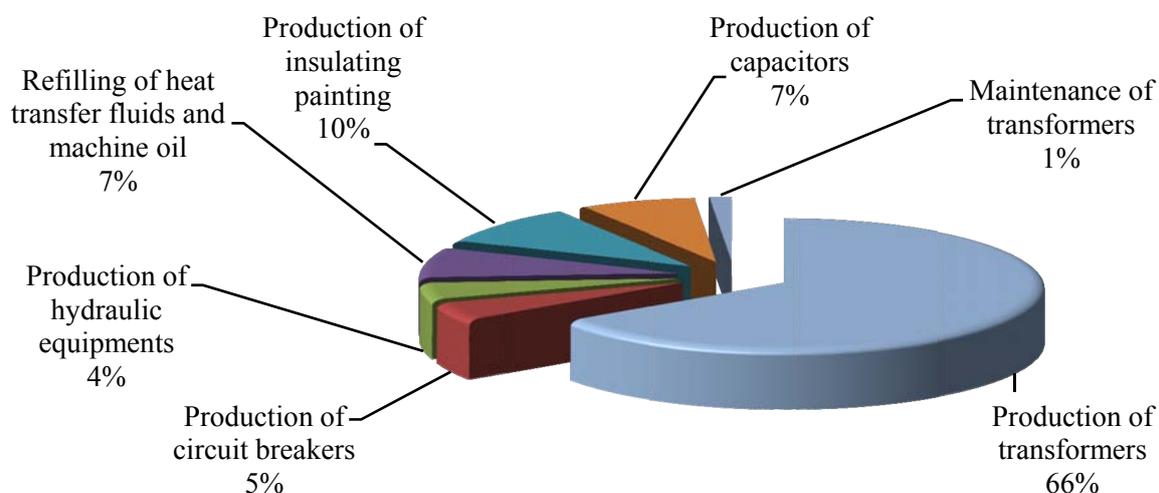
- Production of electric equipment, such as transformers, capacitors, circuit breakers, etc;
- Production of machinery, such as hydraulic equipment, heat exchangers, etc;
- Production of insulating paints, etc;
- Maintenance/service of electric equipment, heat exchangers, hydraulic equipment, etc.

The assessment of the PCBs use in the DPR Korea was conducted in 2006 and the volumes of the annual consumption by each sector have been identified, which are shown in the table below.

Table 2-10: PCBs use by each sector

Year	Production of transformers (in tons)	Production of circuit breakers (in tons)	Production of hydraulic equipment (in tons)	Refilling of heat transfer fluids and machine oil (in tons)	Production of insulating paint (in tons)	Production of capacitors (in tons)	Maintenance of transformers (in tons)
1997	194.2	14.4	13.8	27.0	33.1	20.5	4.2
1998	314.8	14.9	16.6	29.0	31.2	25.7	6.6
1999	333.0	18.2	15.2	25.8	34.9	23.0	7.0
2000	321.0	18.0	12.7	30.4	33.6	26.2	6.8
2001	214.6	15.1	12.1	24.1	38.9	18.8	4.6
2002	309.1	17.4	18.9	26.6	31.8	19.9	6.5
2003	290.3	16.0	17.6	18.1	39.0	28.5	6.1
2004	304.8	20.0	18.7	30.4	33.6	29.5	6.5
2005	354.4	18.8	19.4	31.4	36.4	29.6	7.4
2006	232.2	15.8	14.6	26.3	34.6	26.4	4.9

Figure 2-2: Distribution of PCBs use by each sector in 2006



As shown in the table and figure above, PCBs have been mainly used for producing transformers. Transformers have been produced by the Taean Electric Appliances Factory and Taedonggang Electric Appliances Factory. The total production capacity for PCBs-containing transformers in the above 2 factories is about 850 000 kVA per year. The table below shows the production volume of PCBs containing transformers (including repairing) in the factories.

Table 2-11: Production of transformers containing PCBs

Year	Output (in 10 000 kVA)	Year	Output (in 10 000 kVA)	Year	Output (in 10 000 kVA)
1997	46.8	2001	50.2	2005	74.3
1998	67.4	2002	66.5	2006	53.3
1999	70.6	2003	63.3		
2000	68.6	2004	65.8		

PCBs have also been used for producing circuit breakers. PCBs-containing circuit breakers have been produced in the Kyongsong Insulator Factory, with the annual production capacity of 1 000 kVA. The Kyongsong Insulator Factory is a main production plant producing insulators and circuit breakers in the DPR Korea. The annual production volumes of PCBs-containing circuit breakers (including repairing) in the factory during the last 10 years are shown in the table below.

Table 2-12: Production of circuit breakers containing PCBs

Year	Output (in kVA)	Year	Output (in kVA)	Year	Output (in kVA)
1997	717	2001	746	2005	876
1998	738	2002	826	2006	766
1999	856	2003	776		
2000	853	2004	816		

In addition, in the DPR Korea has been produced PCBs-containing hydraulic equipment. They have been produced by the Ragwon Machine Complex. It has the capacity of producing 100 units of them annually. In the last 10 years, they produced 48 units of PCBs-containing hydraulic equipment per year on average.

Table 2-13: Production of hydraulic equipment containing PCBs

Year	Output (in units)	Year	Output (in units)	Year	Output (in units)
1997	42	1999	46	2001	37
1998	51	2000	38	2002	57

Year	Output (in units)	Year	Output (in units)	Year	Output (in units)
2003	54	2005	58		
2004	57	2006	44		

Another application area of PCBs use in the DPR Korea is for the production of capacitors, of which the yearly production volume is listed in the table below.

Table 2-14: Production of capacitors containing PCBs

Year	Output (in 1 000 kVA)	Year	Output (in 1 000 kVA)	Year	Output (in 1 000 kVA)
1997	69	2001	65	2005	101
1998	90	2002	69	2006	91
1999	79	2003	98		
2000	90	2004	100		

Furthermore, PCBs have been used for the production of insulating paints. The annual production capacity of insulating paints containing PCBs is 600 tons. The table below shows the annual production volumes.

Table 2-15: Production of insulating paints containing PCBs

Year	Output (in tons)	Year	Output (in tons)	Year	Output (in tons)
1997	331	2001	389	2005	364
1998	312	2002	318	2006	346
1999	349	2003	390		
2000	336	2004	336		

PCBs have been also used for maintaining equipment produced, such as electric equipment and other types of machines, in various sectors of the national economy including industries of metal and building-materials, and chemical and light industry, etc.

The import of PCBs-containing equipment

Although electric equipment including capacitors and transformers have been produced and used for over 30 years in the DPR Korea, some of the capacitors, transformers and hydraulic equipment have been imported, as the production has not reached the demand level. Currently the Ministry of Electric Power Industry has 1 105 imported transformers and 354 imported circuit

breakers that could be regarded as containing PCBs, and the Ministry of Machine Industry has 152 imported transformers that might contain PCBs. The overall assessment of the imported equipment containing PCBs has not been finalized yet.

The export of PCBs-containing equipment

The export of PCBs-containing equipment from the DPR Korea is currently being investigated through historical customs records.

Stockpiles and waste

The stockpiles and waste of PCBs are now being assessed in the DPR Korea. All the produced PCBs in a year are usually supplied to the consumers within that year, and the supply agency under each sector of use and the 2.8 Vinalon Complex and the Suncheon Vinalon Complex have their stocks in order to supply for the current year.

2.3.3 Assessment of Annex B chemicals: DDT

Production and Use

In the DPR Korea, DDT has been produced by the 2.8 Vinalon Complex and the Suncheon Vinalon Complex since the early 1960s.

The initial production capacity in the early 1960s was 800 tons per year, but the production volume has been reduced since the early 1990s. In the period of 2001-2006, the average annual DDT production was approximately 232 tons.

Table 2-16: DDT Production

Year	Output (in tons)	Year	Output (in tons)	Year	Output (in tons)
1960s (average)	482.0	1998	103.0	2003	253.0
1970s (average)	569.4	1999	184.6	2004	238.1
1980s (average)	632.9	2000	120.0	2005	221.6
1990s (average)	261.7	2001	230.1	2006	213.0
1997	151.8	2002	236.4		

DDT is mainly used in the sectors of agriculture and public health. The annual amount of DDT use depends on production volumes, but the latter did not usually satisfy the former.

When analyzing the information on DDT use in 2006, it could be concluded that 97 % was used in agriculture and forestry, and the remaining 3 % in public health. The following table shows the amounts of DDT consumption by each sector.

Table 2-17: DDT use by each sector

Year \ Use	Insect control (in tons)	Disease vector control (in tons)
1997	142.1	9.7
1998	92.6	10.4
1999	113.3	6.7
2000	176.8	7.8
2001	220.1	10.0
2002	227.7	8.7
2003	235.5	17.5
2004	216.5	21.6
2005	206.3	15.3
2006	206.7	6.3

In public health, DDT is mainly used for malaria disease vectors control. DDT solution is sprayed on walls indoors. DDT is also applied at the habitats of malaria vectors, such as water pools.

In agriculture and forestry, DDT is used as insecticide for grain including rice, maize and potatoes, as well as for the treatment of forest insects. It is also used for seed treatment.

Import and export of DDT

Currently the historical trade and customs records are being reviewed to assess the import and export of DDT in the DPR Korea.

Stockpiles and waste

At present DDT stockpiles are being assessed in the DPR Korea. As the production does not reach the demand level, the stocks never pass to the next year. The material supply agency under each sector of DDT use has its stocks in order to supply for the current year. However, it could be impossible to assess the volume of stocks because of their irregular changing, except to identify their places.

DDT waste does not reach a considerable level, which is now being assessed.

2.3.4 Assessment of releases from unintentional production of Annex C chemicals

Polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF), HCB and

PCBs listed in Annex C of the Stockholm Convention are unintentionally produced chemicals that are generated from thermal and chemical processes.

Almost all the sectors of industry generate unintentional POPs. The nationwide assessment of PCDD and PCDF releases has been conducted in accordance with the UNEP Toolkit, the result of which is shown in the table below.

Table 2-18: Unintentional POPs releases (in 2006)

Source	Unit	Total	Air	Water	Soil	Product	Residue
Metal production	g-TEQ	91.822	36.291	0.050			55.481
Power generation	g-TEQ	170.195	14.194				156.001
Building material production	g-TEQ	2.230	2.230				
Transport	g-TEQ	0.413	0.413				
Open burning	g-TEQ	1.238	0.922		0.316		
Pulp, paper making, other chemical industry	g-TEQ	54.723	0.013			23.040	31.670
Waste disposal	g-TEQ	30.040		2.340		12.800	14.900
Others	g-TEQ	0.510	0.330			0.130	0.050
Total	g-TEQ	351.171	54.393	2.390	0.316	35.970	258.102

The adverse effect of unintentional POPs on human health, as well as their accumulation, has not been investigated, and qualitative and quantitative analysis of food, consumer goods, soil and water samples have not been fully conducted, because of several problems, such as the inadequate technical capabilities and analytical equipment.

After acceding to the Stockholm Convention, the government has been making efforts to facilitate the activities of improving the data management and technical capacities, paying more attention to protecting human health and environment from the unintentional POPs, such as PCDD and PCDF.

2.3.5 Information on the state of knowledge on stockpiles, contaminated sites and waste

The assessment of POPs waste and contaminated sites is one of the prime requisites to develop the sound management plans.

The NCCE, the Ministry of Land and Environment Protection and the Ministry of Public Health have been engaged in the activity as the focal points. The Ministry of Chemical Industry, the POPs producer, has also participated as a relevant agency. In addition, POPs main users including the sectors of machine industry, electric power industry, agriculture and forestry have been engaged in the activity.

The contaminated sites mainly include the sites of production and use of POPs and POPs containing equipment, including transformers and capacitors. POPs stockpile sites are also regarded as contaminated areas. The initial assessment of the waste and contaminated sites was conducted in April ~ October 2006.

Table 2-19: Sample analysis data (in 2006)

Description	Number of samples	Number of contamination	Pollutants
Soil sample	157	28	HCB
		57	DDT
		22	DDT, HCB
Product sample	66	15	DDT
		19	HCB
		13	DDT, HCH
Wall sample	33	18	DDT, HCH
Water sample	26	12	DDT, HCB

As described above, PCBs have been used in the several sectors of industry in the DPR Korea. Therefore, great attention has been paid to get information on PCBs contamination level in the initial assessment on POPs waste and contaminated sites. However the overall assessment information has not been acquired, but only for 5 selected places, which shows 0.3µg/kg for soil and 2~5µg/l for water on average.

It has been planned to develop a programme for the overall assessment of the waste and contaminated sites by 2012.

2.3.6 Requirements for exemptions

The DPR Korea will apply in due course to have kinds of POPs produced and used in the country included in the register of specific exemptions.

2.3.7 Existing programs for monitoring POPs releases and evaluation of the raised concerns

Environment monitoring includes the overall long-term sampling, analysis, management and observation of adverse effects of the pollutants, including the collection of information on the environment changes and conditions caused by human activities and natural processes.

The state of POPs monitoring

In the DPR Korea the NCCE coordinates the activities regarding Stockholm Convention implementation and ensures the linkages between the related parties. The Ministry of Land and Environment Protection monitors the environment and ensures the proper management of contaminants. The agencies of POPs production and use have the responsibilities for the adverse effects on human health and environment by POPs produced or used by them, and should make every possible effort to reduce the effects.

In the main industrial or populated areas, there exist environment monitoring posts to observe and control abnormal events occurring in their district and report to the Ministry of Land and Environment Protection.

The Research Institute for Environment Protection, the Academy of Medical Science, the Academy of Agricultural Science and Analysis Institutes under the Academy of Sciences conduct analysis and study on the contaminants in air, soil and water, and report results to the agency concerned.

The public education organizations including the Hygienic Publicity Agency conduct education on the adverse effects and lifecycle of POPs, and the relations between contaminants and the environment.

Evaluation of the POPs concerns

In the DPR Korea there has already been established the legal and administrative system regarding the overall management of environment, including the Law on Environment Protection adopted. However, a legal and administrative framework addressing POPs-related issues has not yet been established.

It needs a great deal of efforts, and financial and technical assistance to reduce or phase out the production, use and release of POPs in the DPR Korea. The assessment of the POPs monitoring and their waste and contaminated sites began after acceding to the Stockholm Convention in 2002, but has not made significant progress due to several socio-economic reasons.

2.3.8 Current level of information, awareness and education among target groups

In the DPR Korea the information is regularly communicated through mass media, social organizations, information technology centers and educational institutions, as well as the national administrative system. Especially, the system of information dissemination and quarantine for prophylaxis of infectious diseases can be considered to have reached a considerably high level. However, a similar system for environmentally sound management of chemicals has not yet been properly established.

One of the important concerns is the lack of coordination of the safe management of chemicals including POPs. Some of the scientific or educational institutions and environment protection agencies conduct information distribution, but without mutual connection and in a sporadic manner.

In the DPR Korea POPs information distribution has been conducted in the process of implementing the Enabling Activity Project for the preparation of NIP. The Project Office has played the role as the centre for information distribution. The information distribution activity has been focused on awareness raising among decision makers. POPs publicity campaigns have been performed 3 times through various awareness raising means. During the campaigns, lectures for the decision makers have been delivered 3 times and a pamphlet has been published to be distributed to the ministries and relevant agencies.

TV interviews have been organized 3 times and broadcasted on 6 occasions, and 5 kinds of multimedia including “POPs and our life” and “Dioxins and Furans” have been developed and broadcasted through various TV channels.



Furthermore, 5 kinds of posters have been published and distributed, and popular lectures have been organized for awareness raising all over the country.

Through the campaigns, the POPs awareness among decision makers and people at large has been considerably enhanced, inspiring their intention to voluntarily participate in environmentally sound chemicals management. The number of participants has been increased 2 times since its starting.

Discussions with the Ministry of Education and educational institutions led to an agreement made that the sound chemicals management should be included in the secondary and higher education curricula. The establishment of POPs Information Centre has been proposed and a relevant plan is now being prepared.

2.3.9 Relevant activities of public organizations

Environment protection agencies, public health institutions and hygienic and anti-epidemic establishments in the DPR Korea have played an important role in developing inventories and awareness raising campaigns for disseminating the knowledge on POPs. Likewise, several academic institutes and research organizations have made important contribution to the effort to collect and communicate available preliminary information on POPs monitoring in the country with specific reference to the contaminated sites.

2.3.10 Overview of technical infrastructure for POPs assessment, measurement, analysis, alternatives and preventive measures, management, research and development

The technical infrastructure in the DPR Korea for POPs assessment, analysis and R&D has not yet been fully developed.

The Hamhung Branch of the Academy of Sciences, the Academy of Medical Science, the Academy of Agricultural Science and the Environment Protection Research Institute have their own laboratories and research groups for studying the adverse effects of organic chemicals upon environment and human health, and the preventive measures. However, their technical capacity has not reached a due level, without sufficient modern technical equipment, and their activities in most cases have been directed to hazardous organic chemicals, seldom concentrating on POPs. Their current technical capacity has to be upgraded to ensure overall POPs assessment including their waste and contamination in the DPR Korea.

Research on POPs alternatives is an important task in the DPR Korea. The Ministry of Chemical Industry has industrial research institutes for the safe management of chemical production processes and sound treatment of chemical waste, which are responsible for developing efficient POPs alternatives and designing alternative production processes, as well as improving the waste treatment situation. However, their current technical capacities have not been so sufficient as to expect desired outcomes of the above-mentioned tasks.

2.3.11 Identification of impacted populations or environments

Groups likely to be affected by POPs, namely by HCB, PCBs and DDT, mainly include those engaged in the production, distribution and use of POPs and groups living in close vicinity of these point sources and storage sites, particularly women and children. Of these groups, people exposed during the production and use of POPs are most likely to be at a relatively high level of POPs concentration in their body tissues.

3 Strategy and Action Plan Elements of the National Implementation Plan

3.1 General policy statement

The development of POPs management strategy will constitute the basis of activities for the overall chemicals management, as well as the environmentally sound management of POPs, and make a clear contribution to removing the environmental threats caused by POPs chemicals in the country and globally.

This chapter addresses the strategic matters including the POPs management policies, goals and priorities in the country.

3.1.1 General policy

The government of the DPR Korea will implement the NIP on POPs in conformity with the requirements of the Stockholm Convention, with all their possible efforts and in cooperation with the relevant international organizations including the Stockholm Convention Secretariat, Global Environment Facility and the UNEP, to improve the POPs state in the country and contribute to the environment and human health protection.

The DPR Korea will develop legal and administrative frameworks to build a firm foundation for POPs elimination in the country. The government will focus on phasing out POPs sources including the production and use. It will build technical capacities to successfully deal with POPs concerns, especially regarding POPs alternatives and unintentionally produced POPs. It will develop strategic plans for the sound management of stockpiles, waste and articles in use, as well as the remediation of contaminated sites, and make efforts for the ultimate elimination of POPs in the country.

The objective of the development of POPs management strategy

The objective of the development of POPs management strategy is to constitute the basis of the development of the most effective and country specific action plans, to ensure the protection of human health and environment from the production, use and releases of POPs and to implement successfully the obligations as a party to the Stockholm Convention.

The strategy should be developed representing all the interests of the related agencies, social organizations and individuals, to get a full agreement.

3.1.2 Principles in developing POPs management strategy

- To be based on complete and clear understanding of the POPs effects on human health and environment in the DPR Korea
- To be focused on reducing and eliminating the adverse effects on human health and

environment caused by the production, use and release of POPs

- To ensure the national cooperation involving all economic sectors including industry and agriculture, relevant agencies, and social organizations for the environmentally sound management of POPs
- To obtain international technical and financial cooperation and assistance, holding firm to the principle of independence, in solving the POPs concerns to protect human health and environment

3.1.3 National goals in the POPs management

- To establish and complete a comprehensive and sound national regulatory and administrative system that will facilitate the reduction of adverse effects of POPs on human health and environment to the minimum
- To reduce and phase out the production, use and release of POPs
- To legally, administratively and technically guarantee that POPs sources do not reproduced and their adverse effects do not recur

3.1.4 National priorities

It is one of the important matters to decide which sector should be given a priority.

Reasonable prioritization will provide the national management strategy with rationality and universality based on sound reasons and furthermore make it practical to implement the strategy.

Through several rounds of trainings, consultations and field surveys conducted in June ~ October 2006, the criteria for prioritizing have been set, in accordance with which the sectors listed below have been prioritized:

- Establishment of legal and administrative system, public awareness raising
- Strengthening technical and institutional capacity to deal with POPs issues
- Phasing out PCBs production and use
- Phasing out POPs pesticides production and use
- Reducing releases of unintentionally produced POPs
- Environmentally sound disposal of POPs stockpiles and waste, and articles in use containing POPs
- Remediation of contaminated sites in an environmentally sound manner

3.2 Implementation strategy

All Government agencies, organizations and institutes at central and local levels will incorporate respective tasks into their own work plans and organize their activities to implement them in a timely manner in accordance with the requirements of the NIP.

Financial assistance from resources in and outside the country is the prerequisite for the successful implementation of the NIP. The NCCE will make efforts to build appropriate financial mechanism mobilizing every possible financial resources.

All the relevant agencies and institutions responsible for individual action plans and activities will make efforts to prepare most reasonable and reliable relevant projects under the guidance of the NCCE and in cooperation with relevant international organizations, to ensure the successful implementation of the individual projects.

The NCCE will be fully responsible for the coordination of all the activities regarding implementation of the DPR Korea's NIP for the Stockholm Convention; regularly supervising the progress achieved in the implementation of the Convention; organizing and performing the evaluations; and adjusting and updating the NIP on a timely basis in line with Decisions SC-1/12 and SC-2/7 as required by the Conference of the Parties (COP) of the Stockholm Convention.

In compliance with decision SC-3/8 of the COP of the Stockholm Convention that invited Parties to provide the Secretariat with an indication of their main priorities in implementing their national implementation plans for the period 2007–2015, NCCE will make an effort to provide relevant information.

In addition, the NCCE will be responsible, pursuant to Article 15 of the Convention, for reporting to the COP on the measures it has taken to implement the provisions of the Convention and on effectiveness of such measures in meeting the objectives of the Convention as described in decision SC-1/22. Other reporting responsibilities and requests for specific exemptions will also be the responsibility of NCCE as follows:

- Decision SC-1/24: Format for country reporting on requesting extension of specific exemptions;
- Decision SC-1/25 and SC-3/2: Format for reporting on DDT uses for disease vector control; and
- Decision SC-2/18: Format for reporting on the progress in eliminating PCBs.

3.3 Activities, strategies and action plans

It should be noted that this subchapter does not strictly follow the NIP guidance document but rather follows the national priorities that have been established during the preparation process.

The rationale of this decision is that some of the activities covered in the guidance document have not yet reached the requirement in the DPR Korea to prepare a fully developed action plan.

3.3.1 Activity 1: Strengthening the legislative infrastructure for control of POPs and enforcement

Objective: To build an effective legal basis of POPs management to legally guarantee the POPs elimination.

Specific actions

- 3.3.1.1: The NCCE and the Ministry of Land and Environment Protection will, by 2011, develop and propose appropriate regulations to fill legal gaps on POPs production, use, import, export, distribution, waste, stockpiles, emissions and contaminated sites.
- 3.3.1.2: The NCCE and the Ministry of Land and Environment Protection will, by 2011, establish an enforcement mechanism to supervise and evaluate POPs-related activities.
- 3.3.1.3: The Ministry of Land and Environment Protection will, by 2015, revise or develop the environmental quality standards in such aspects related to POPs as air, water, soil, etc.
- 3.3.1.4: The National Quality Supervision Bureau will, by 2015, revise or develop product quality standards related to POPs.
- 3.3.1.5: The Ministry of Public Health and the Hygienic Research Institute will, by 2015, revise or develop food quality standards related to POPs.

3.3.2 Activity 2: Promotion of awareness in relation to POPs

To eliminate POPs is a comprehensive, cross-cutting and long-term project, which could not be implemented with the involvement of only special government bodies or some individuals.

During the development of the NIP, it has been identified that the national and international efforts to eliminate POPs could be crowned with success, provided all the relevant organizations participate voluntarily and intentionally, accompanied by the support of the whole society. It is necessary to continue the awareness raising campaign to inform the public at large of POPs and their adverse effects on human life and environment to let them participate voluntarily in the elimination of POPs.

Objective: To secure active involvement of and support from relevant organizations and popular masses.

Specific actions

- 3.3.2.1: The NCCE, the Ministry of Chemical Industry, the Ministry of Land and Environment Protection and the Hygienic Research Institute will, by 2009, establish a “POPs Information Centre”, which will develop a series of awareness raising programs and materials, targeted at the public and the officials in state institutions.

The “POPs Information Centre” should be established as the focal point of awareness raising activities. This centre will be developed into the “Chemicals Management Information Centre” for the implementation of SAICM in the country. It will collect, analyze and systematically process all the information related to POPs to develop awareness raising media to be distributed to the society, and will assess the awareness level among people to develop recommendations including improvement measures.

- 3.3.2.2: The Ministry of Chemical Industry, the Ministry of Land and Environment Protection and the Hygienic Research Institute will, in 2010, survey awareness level among the public and officials of state agencies and develop annual work plans.
- 3.3.2.3: The Ministry of Chemical Industry, the Ministry of Land and Environment Protection and the Hygienic Research Institute will, during 2010~2015, conduct activities of developing, broadcasting and distributing the materials for awareness raising in accordance with the annual work plans.

3.3.3 Activity 3: Strengthening the information Base, surveillance and data management in relation to POPs

Objective: To provide accurate information on POPs on a timely basis.

Specific actions

- 3.3.3.1: The Academy of Medical Science will, by 2025, develop and implement a program for health monitoring and surveillance of exposure to POPs, including systematic data collection.
- 3.3.3.2: The Ministry of Land and Environment Protection will, by 2025, develop and implement a program for environment monitoring and surveillance of exposure to POPs, including systematic data collection.
- 3.3.3.3: The Ministry of Land and Environment Protection and the Ministry of Chemical Industry will, in 2010, establish, through the POPs Information Centre, a web-based information management tool to promote improved access to data on POPs, which should be updated at a regular or continuous basis following up the progress in implementation of the NIP action plans.

3.3.4 Activity 4: Institutional strengthening

Objective: To strengthen the capacity of POPs-related agencies and institutions, so as to provide the effective administrative and technical frameworks in the field of POPs management.

Specific actions

- 3.3.4.1: The NCCE will, by 2010, establish a legally-constituted administrative coordinating system for regular consultation among all organizations concerning implementation of the Stockholm Convention.
- 3.3.4.2: The Ministry of Land and Environment Protection, the Academy of Medical Science, the Academy of Agricultural Science, the Ministry of City Management and the Hygienic Research Institute will, by 2011, develop and implement a program to strengthen the analytical capacity at selected existing laboratories for the required surveys, surveillance and monitoring program for POPs.
- 3.3.4.3: The Ministry of Land and Environment Protection will, by 2011, strengthen the capacity of the Central Environmental Monitoring and Supervision Agency and its local stations, to provide efficient POPs monitoring.
- 3.3.4.4: The NCCE will, by 2011, provide training for relevant officials and experts engaged in the implementation of the NIP.
- 3.3.4.5: The NCCE, the Ministry of Chemical Industry and the Ministry of Land and Environment Protection will, by 2010, establish a chemical and waste management system for promoting and monitoring the implementation of NIP, as well as other chemical and waste related international agreements.
- 3.3.4.6: The Ministry of Chemical Industry, the Ministry of Land and Environment Protection and the Academy of Sciences will, by 2009, establish, on the basis of the current capacity of industrial technical institutes and the environment protection institute, a research institute to conduct research on the alternatives for POPs, as well as other hazardous organic chemicals produced in the DPR Korea.
- 3.3.4.7: The Ministry of Public Health and the Academy of Medical Science will, by 2010, establish, on the basis of the current capacity of research institutes, a research institute to conduct research on POPs impact on human health.
- 3.3.4.8: The Academy of Agricultural Science will, by 2010, establish, on the basis of the current capacity of technical institutes, a research institute to conduct research on the rehabilitation/remediation of contaminated sites and the effects of POPs on the environment, as well as other hazardous organic chemicals used in the DPR Korea.
- 3.3.4.9: The Ministry of Agriculture and the Academy of Agricultural Science will, by 2011, further strengthen a national system of registering and authorizing pesticides for the

safe management of POPs pesticides and their alternatives.

- 3.3.4.10: The Ministry of Land and Environment Protection and the Ministry of Metal Industry will, by 2010, establish, on the basis of the current capacity of technical institutes, a research institute to conduct research into BAT and BEP measures for reduction of unintentional POPs release.

3.3.5 Activity 5: Elimination of PCBs use, management of the waste

The following concerns could occur as a result of the elimination of PCBs use.

- It should be necessary to change the designs and specifications of electric equipment and insulating goods or facilities, when the alternative with different physicochemical characteristics is introduced.
- There could be change in the price of final products in accordance with the difference in the cost between PCBs and the alternative, which could have favorable or adverse effect.

Objective: To phase out PCBs use in industrial sectors and manage their waste in an environmentally sound manner.

Specific actions

- 3.3.5.1: The Ministry of Machine Industry will, by 2012, take measures to convert the production process of transformers containing PCBs to the one of producing PCBs-free transformers.
- 3.3.5.2: The Ministry of Machine Industry will, by 2012, take measures to convert the production process of circuit breakers containing PCBs to the one of producing PCBs-free circuit breakers.
- 3.3.5.3: The Ministry of Machine Industry will, by 2012, take measures to establish and introduce the process of producing PCBs-free hydraulic equipment.
- 3.3.5.4: The Ministry of Electric Power Industry will, by 2012, take measures to establish and introduce the process of producing PCBs-free capacitors.
- 3.3.5.5: The Ministry of Chemical Industry will, by 2012, take measures to establish and introduce the process of producing PCBs-free insulating paints.
- 3.3.5.6: The Ministry of Chemical Industry, the Ministry of Machine Industry and other relevant agencies will, by 2012, take measures to gradually phase out the use of PCBs in the maintenance of heat exchangers and other machines, and start using their alternatives.
- 3.3.5.7: The Ministry of Electric Power Industry, the Ministry of Machine Industry, the

Ministry of Metal Industry and other relevant agencies will, by 2011, identify and label PCBs-containing equipment.

- 3.3.5.8: The Ministry of Chemical Industry, the Ministry of Land and Environment Protection, the Ministry of Machine Industry and other relevant agencies will, by 2011, identify and label PCBs waste in the sectors of PCBs production and use.
- 3.3.5.9: The Ministry of Machine Industry, the Ministry of Electric Power Industry, the Ministry of Metal Industry and other relevant agencies will, during 2012 ~ 2015, safely manage, replace and dispose of PCBs-containing equipment.
- 3.3.5.10: The Ministry of Chemical Industry, the Ministry of Land and Environment Protection, the Ministry of Machine Industry and other relevant agencies will, during 2012 ~ 2015, safely dispose of PCBs waste in the sectors of production and use.

3.3.6 Activity 6: Elimination of POPs pesticides use, management of the waste

Objective: To phase out POPs pesticides use in all relevant sectors and manage their waste in an environmentally sound manner.

Specific actions

- 3.3.6.1: The Ministry of Public Health, the Academy of Medical Science, the Ministry of Agriculture and the Academy of Agricultural Science will, by 2013, take measures to gradually phase out the use of HCB and start using their alternatives.
- 3.3.6.2: The Ministry of Public Health, the Academy of Medical Science, the Ministry of Agriculture and the Academy of Agricultural Science will, by 2013, take measures to gradually phase out the use of DDT and start using their alternatives.
- 3.3.6.3: The Ministry of Chemical Industry will, by 2013, take measures to establish and introduce the HCB-free process of producing an herbicide and a plasticizer.
- 3.3.6.4: The Ministry of Public Health, the Academy of Medical Science, the Ministry of Agriculture, the Academy of Agricultural Science and the Ministry of Chemical Industry will, by 2015, identify the total volume of POPs pesticides stock and eliminate them in an environmentally friendly and safe manner.
- 3.3.6.5: The Ministry of Public Health, the Academy of Medical Science, the Ministry of Agriculture, the Academy of Agricultural Science and the Ministry of Chemical Industry will, by 2015, accurately assess and establish inventories of the POPs pesticides waste and eliminate them in an environmentally friendly and safe manner.

3.3.7 Activity 7: Elimination of POPs production

Eliminating POPs production involving various socio-economic concerns is a primary priority in the POPs management strategy.

The benefits from the elimination of POPs production are listed as follows:

- Intentional POPs sources will be eliminated.
- The threat to health of people engaged in POPs production will be removed and there will be no increasing problems regarding contaminated sites near the production areas.
- It will lead to the elimination of POPs use based on their production and to likely getting rid of environmental and health concerns.

The risks raised from the elimination of POPs production could be listed as follows:

- There could be no financial profit from production, and labor concerns may arise.
- The other economic sectors using POPs will be adversely affected in their economic activities, which could cause financial loss.
- There will be a concern of treatment of contaminated production facilities and production sites.

The above-mentioned concerns indicate that the production should be eliminated, provided that the alternative solutions are identified and timely arranged.

POPs are produced by the 2.8 Vinalon Complex, the Suncheon Vinalon Complex and the Hungnam Pharmaceutical Factory. The 2.8 Vinalon Complex and the Suncheon Vinalon Complex are the largest producers of POPs in the DPR Korea. They are the centers of production of organochlorine compounds in the country. POPs produced are DDT, HCB and PCBs.

It should be noted that TCB production should be phased out, because TCB, as the solvent of PCBs, will have no use in the DPR Korea if the PCBs production process is dismantled.

In accordance with the principle of setting priority on the elimination of intentional POPs production, the sector of POPs production has been identified as one of the priorities.

Objective: To eliminate intentional POPs sources.

Specific actions

- 3.3.7.1: The Ministry of Chemical Industry will, by 2012, take measures to dismantle the PCBs production process and establish a new process of producing an alternative.

- 3.3.7.2: The Ministry of Chemical Industry will, by 2012, take measures to dismantle the TCB production process and establish a new process of producing an alternative.
- 3.3.7.3: The Ministry of Chemical Industry and the Ministry of Public Health will, by 2013, take measures to dismantle the HCB production processes and establish new processes of producing an alternative.
- 3.3.7.4: The Ministry of Chemical Industry will, by 2013, take measures to dismantle the DDT production process and establish a new process of producing an alternative.
- 3.3.7.5: The Ministry of Chemical Industry and the Ministry of Public Health will, by 2015, take measures to dispose of contaminated equipment and remediate contaminated sites in an environmentally sound manner in POPs production plants.

3.3.8 Activity 8: Identification and management of contaminated sites and articles

In the DPR Korea, POPs have been produced and used over a relatively long period of time, during which a considerable number of areas and articles have been contaminated. By the initial investigation, a degree of contamination beyond tolerance has been detected in areas of POPs production and use and it has been identified that the contaminants have not been kept and managed in a safe manner. However, investigations and analysis for identifying contaminated sites and articles have not been fully conducted yet, due to the lack of adequate capacity.

Objective: To obtain accurate information and data on POPs-contaminated sites and articles and rehabilitate and dispose of them in order to contribute to the final elimination of POPs in the DPR Korea.

Specific actions

- 3.3.8.1: The Ministry of Land and Environment Protection will, by 2012, identify contaminated sites and carry out preliminary sampling to measure their contamination level.
- 3.3.8.2: The Ministry of Land and Environment Protection will, by 2015, develop a program including the measures for environmentally sound management and disposal of all contaminated products and materials having the contamination level beyond national tolerance limits.
- 3.3.8.3: The Ministry of Land and Environment Protection and other relevant agencies will, by 2020, completely dispose of contaminated materials and products.
- 3.3.8.4: The Ministry of Land and Environment Protection will, by 2015, identify and prioritize the areas, which should be rehabilitated/remediated due to their contamination level, and develop a rehabilitation/remediation program.
- 3.3.8.5: The Ministry of Land and Environment Protection and other relevant agencies will,

by 2025, rehabilitate/remediate the contaminated sites, giving priority to the high level contamination areas.

3.3.9 Activity 9: Reduction of unintentional POPs emissions

Objective: To reduce or eliminate the releases of unintentional POPs in all relevant sectors.

Specific actions

- 3.3.9.1: The Ministry of Land and Environment Protection and the Ministry of Metal Industry will, by 2012, complete UNEP Toolkit-based inventories of unintentional POPs releases and start to create monitoring in priority sectors for implementation of BAT and BEP.
- 3.3.9.2: The Ministry of Metal Industry, the Ministry of Electric Power Industry, the Ministry of Construction and Building-materials Industry, the Ministry of Chemical Industry, the Ministry of City Management and other relevant agencies will, by 2015, identify and implement BAT and BEP measures in pilot production units in selected priority sectors.

3.4 Development and capacity-building proposals and priorities

The national priorities in the implementation of the obligations of the Stockholm Convention are listed in paragraph 3.1.4 and described in ranking priority order detailing individual activities within the respective action plans in paragraph 3.3 above. Each action plan, explicitly or implicitly, includes a capacity building component that will enhance the administrative, legal and technical capabilities of the relevant agencies.

Capacity building is a basis for the successful implementation of the Stockholm Convention and an important part of the action plans, assuring the timely implementation of the NIP.

Capacity building priorities of the DPR Korea in the period of 2009-2015 have been identified as follows:

- Strengthening managerial and knowledge-based capabilities of Convention implementation institutions at central and local levels;
- Enhancing legislative and regulatory infrastructure with specific reference to developing limit levels pertaining to POPs;
- Enhancing capacities regarding POPs monitoring, sampling and analysis
- Establishing technical capacities with reference to research into POPs alternatives and on other POPs management activities

- Establishing economic policies and financial mechanism taking care of the potential socio-economic pressure for Convention implementation with specific reference to phasing out POPs production and use, and introducing substitutes;
- Enhancing technology with specific reference to introducing BAT/BEP; and
- Enhancing public awareness and education among people at large with specific reference to vulnerable groups like women and children.

3.5 Timetable for planning implementation of action plans

In the DPR Korea the timetable of the NIP implementation has been prepared not to exceed 2015, with a few exceptions. This approach is in line with Decision SC-3/8 of the Third Session of the Conference of the Parties of the Stockholm Convention by which Parties were invited to provide the Secretariat with an indication of their main priorities in implementing their national implementation plans for the period 2007–2015. Those with the duration beyond 2015 are related with the continuous monitoring and management of contaminated sites and articles.

Table 3-1: Timetable of the action plans

No	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
Activity 1: Strengthening the legislative infrastructure for control of POPs and enforcement											
3.3.1.1	To develop and propose appropriate regulations to fill legal gaps on POPs production, use, import, export, distribution, waste, stockpiles, emissions and contaminated sites	NCCE, MLEP									
3.3.1.2	To establish an enforcement mechanism to supervise and evaluate POPs-related activities	NCCE, MLEP									
3.3.1.3	To revise or develop the environmental quality standards in such aspects related to POPs as air, water, soil, etc.	MLEP									
3.3.1.4	To revise or develop product quality standards related to POPs	NQSB									
3.3.1.5	To revise or develop food quality standards related to POPs	MPH, HRI									
Activity 2: Promotion of awareness in relation to POPs											
3.3.2.1	To establish a “POPs Information Centre”, which will develop a series of awareness raising programs and materials, targeted at the public and the officials in state institutions	NCCE, MCI, MLEP, HRI									
3.3.2.2	To survey awareness level among the public and officials of state agencies and develop annual work plans	MCI, MLEP, HRI									

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№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.2.3	To conduct activities of developing, broadcasting and distributing the materials for awareness raising in accordance with the annual work plans	MCI, MLEP, HRI									
Activity 3: Strengthening the information Base, surveillance and data management in relation to POPs											
3.3.3.1	To develop and implement a program for health monitoring and surveillance of exposure to POPs, including systematic data collection	AMS									
3.3.3.2	To develop and implement a program for environment monitoring and surveillance of exposure to POPs, including systematic data collection	MLEP									
3.3.3.3	To establish, through the POPs Information Centre, a web-based information management tool to promote improved access to data on POPs, which should be updated at a regular or continuous basis following up the progress in implementation of the NIP action plans	MLEP, MCI									
Activity 4: Institutional strengthening											
3.3.4.1	To establish a legally-constituted administrative coordinating system for regular consultation among all organizations concerning implementation of the Stockholm Convention	NCCE									

№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.4.2	To develop and implement a program to strengthen the analytical capacity at selected existing laboratories for the required surveys, surveillance and monitoring program for POPs	MLEP, AMS, AAS, MCM, HRI									
3.3.4.3	To strengthen the capacity of the Central Environmental Monitoring and Supervision Agency and its local stations, to provide efficient POPs monitoring	MLEP									
3.3.4.4	To provide training for relevant officials and experts engaged in the implementation of the NIP	NCCE									
3.3.4.5	To establish a chemical and waste management system for promoting and monitoring the implementation of NIP, as well as other chemical and waste related international agreements	NCCE, MCI, MLEP									
3.3.4.6	To establish, on the basis of the current capacity of industrial technical institutes and the environment protection institute, a research institute to conduct research on the alternatives for POPs, as well as other hazardous organic chemicals produced in the DPR Korea	MCI, MLEP, AS									
3.3.4.7	To establish, on the basis of the current capacity of research institutes, a research institute to conduct research on POPs impact on human health	MPH, AMS									

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№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.4.8	To establish, on the basis of the current capacity of technical institutes, a research institute to conduct research on the rehabilitation/remediation of contaminated sites and the effects of POPs on the environment, as well as other hazardous organic chemicals used in the DPR Korea	AAS									
3.3.4.9	To further strengthen a national system of registering and authorizing pesticides for the safe management of POPs pesticides and their alternatives	MA, AAS									
3.3.4.10	To establish, on the basis of the current capacity of technical institutes, a research institute to conduct research into BAT and BEP measures for reduction of unintentional POPs release	MLEP, MMtI									
Activity 5: Elimination of PCBs use, management of the waste											
3.3.5.1	To take measures to convert the production process of transformers containing PCBs to the one of producing PCBs-free transformers	MMI									
3.3.5.2	To take measures to convert the production process of circuit breakers containing PCBs to the one of producing PCBs-free circuit breakers	MMI									
3.3.5.3	To take measures to establish and introduce the process of producing PCBs-free hydraulic equipment	MMI									
3.3.5.4	To take measures to establish and introduce the process of producing PCBs-free capacitors	MEPI									

№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.5.5	To take measures to establish and introduce the process of producing PCBs-free insulating paints	MCI									
3.3.5.6	To take measures to gradually phase out the use of PCBs in the maintenance of heat exchangers and other machines, and start using their alternatives	MCI, MMI, relevant agencies									
3.3.5.7	To identify and label PCBs-containing equipment	MEPI, MMI, MMtI, relevant agencies									
3.3.5.8	To identify and label PCBs waste in the sectors of PCBs production and use	MCI, MLEP, MMI, relevant agencies									
3.3.5.9	To safely manage, replace and dispose of PCBs-containing equipment	MEPI, MMI, MMtI, relevant agencies									
3.3.5.10	To safely dispose of PCBs waste in the sectors of production and use	MCI, MLEP, MMI, relevant agencies									
Activity 6: Elimination of POPs Pesticides use, management of the waste											
3.3.6.1	To take measures to gradually phase out the use of HCB and start using their alternatives	MPH, AMS, MA, AAS									
3.3.6.2	To take measures to gradually phase out the use of DDT and start using their alternatives	MPH, AMS, MA, AAS									

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№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.6.3	To take measures to establish and introduce the HCB-free process of producing an herbicide and a plasticizer.	MCI									
3.3.6.4	To identify the total volume of POPs pesticides stock and eliminate them in an environmentally friendly and safe manner	MPH, AMS, MA, AAS, MCI									
3.3.6.5	To accurately assess and establish inventories of the POPs pesticides waste and eliminate them in an environmentally friendly and safe manner	MPH, AMS, MA, AAS, MCI									
Activity 7: Elimination of POPs production											
3.3.7.1	To take measures to dismantle the PCBs production process and establish a new process of producing an alternative	MCI									
3.3.7.2	To take measures to dismantle the TCB production process and establish a new process of producing an alternative	MCI									
3.3.7.3	To take measures to dismantle the HCB production processes and establish new processes of producing an alternative	MCI, MPH									
3.3.7.4	To take measures to dismantle the DDT production process and establish a new process of producing an alternative	MCI									
3.3.7.5	To take measures to dispose of contaminated equipment and remediate contaminated sites in an environmentally sound manner in POPs production plants	MCI, MPH									

№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
Activity 8: Identification and management of contaminated sites and articles											
3.3.8.1	To identify contaminated sites and carry out preliminary sampling to measure their contamination level	MLEP									
3.3.8.2	To develop a program including the measures for environmentally sound management and disposal of all contaminated products and materials having the contamination level beyond national tolerance limits	MLEP									
3.3.8.3	To completely dispose of contaminated materials and products	MLEP, relevant agencies									
3.3.8.4	To identify and prioritize the areas, which should be rehabilitated/remediated due to their contamination level, and develop a rehabilitation/remediation program	MLEP									
3.3.8.5	To rehabilitate/remediate the contaminated sites, giving priority to the high level contamination areas	MLEP, relevant agencies									
Activity 9: Reduction of unintentional POPs emissions											
3.3.9.1	To complete UNEP Toolkit-based inventories of unintentional POPs releases and start to create monitoring in priority sectors for implementation of BAT and BEP	MLEP, MMtI									

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№	Description	Responsible agencies	2009	2010	2011	2012	2013	2014	2015	2020	2025
3.3.9.2	To identify and implement BAT and BEP measures in pilot production units in selected priority sectors	MMtI, MEPI, MCBI, MCI, MCM, relevant agencies									

3.6 Requirements of technical and financial resources

To eliminate POPs will take a great deal of efforts, a long period of time and a large amount of funds. Especially the international cooperation is essential to provide necessary techniques and funds to the implantation of the NIP.

The following two kinds of resources are regarded for the elimination of POPs:

- National resources
 - National budget
 - Financial resources of individual sectors (ministries, agencies)
 - Technical and financial cooperation between sectors (ministries, agencies)
 - Technical cooperation between research institutes and/or producers
 - Mobilization of human resources by promotion of public awareness
- International resources
 - Technical and financial cooperation with international organizations
 - Cooperation with NGOs in relation to public health and environment
 - Bilateral cooperation between nations

In the DPR Korea the bulk of financial resources will be required for the NIP implementation activities, including the decommissioning of the existing POPs production plants that are in operation, the introducing of affordable substitute products replacing POPs, and the establishing of the monitoring infrastructure for POPs sampling and analysis, etc. Especially, the decommissioning of existing POPs production processes may create acute socio-economic concerns.

The Third Session of the Conference of the Parties, in its Decision SC-3/8, requested the Secretariat of the Stockholm Convention to develop further the draft guidance on social and economic assessment for the development and implementation of persistent organic pollutant national implementation plans to take into account the particular circumstances of developing countries and countries with economies in transition.

In its second meeting of the Open-ended Ad Hoc Working Group on Non-compliance held prior to the COP many countries expressed that the issues of technical assistance and compliance were closely linked. The Open-ended Ad Hoc Working Group agreed to provide further support under the Convention for the Party concerned, including further advice and the facilitation, as appropriate, of access to financial resources, technical assistance, technology

transfer, training and other capacity-building measures. This is in line with the spirit of the Stockholm Convention that “the developed country Parties shall provide new and additional financial resources to enable developing country Parties and Parties with economies in transition to meet the agreed full incremental costs of implementing measures which fulfill their obligations under this Convention” (Article 13, paragraph 2 on Financial resources and mechanisms).

The incremental costs needed for implementation of action plans under the NIP are estimated at US\$ 119 100 000. However, it could be revised during the process of the NIP implementation and the accurate incremental costs should be presented in the individual project document for the implementation of each activity.

Table 3-2: Incremental costs requirements for the action plans

No	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
<i>Activity 1: Strengthening the legislative infrastructure for control of POPs and enforcement</i>				
3.3.1.1	To develop and propose appropriate regulations to fill legal gaps on POPs production, use, import, export, distribution, waste, stockpiles, emissions and contaminated sites	NCCE, MLEP	Gov, GEF	0.2
3.3.1.2	To establish an enforcement mechanism to supervise and evaluate POPs-related activities	NCCE, MLEP	Gov	0.1
3.3.1.3	To revise or develop the environmental quality standards in such aspects related to POPs as air, water, soil, etc.	MLEP	Gov, GEF	0.2
3.3.1.4	To revise or develop product quality standards related to POPs	NQSB	Gov, GEF	0.2
3.3.1.5	To revise or develop food quality standards related to POPs	MPH, HRI	Gov, GEF	0.2
<i>Activity 2: Promotion of awareness in relation to POPs</i>				
3.3.2.1	To establish a “POPs Information Centre”, which will develop a series of awareness raising programs and materials, targeted at the public and the officials in state institutions	NCCE, MCI, MLEP, HRI	Gov, GEF	0.1
3.3.2.2	To survey awareness level among the public and officials of state agencies and develop annual work plans	MCI, MLEP, HRI	Gov, GEF	0.1

№	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
3.3.2.3	To conduct activities of developing, broadcasting and distributing the materials for awareness raising in accordance with the annual work plans	MCI, MLEP, HRI	Gov, GEF	0.5
Activity 3: Strengthening the information Base, surveillance and data management in relation to POPs				
3.3.3.1	To develop and implement a program for health monitoring and surveillance of exposure to POPs, including systematic data collection	AMS	Gov, GEF	1
3.3.3.2	To develop and implement a program for environment monitoring and surveillance of exposure to POPs, including systematic data collection	MLEP	Gov, GEF	1
3.3.3.3	To establish, through the POPs Information Centre, a web-based information management tool to promote improved access to data on POPs, which should be updated at a regular or continuous basis following up the progress in implementation of the NIP action plans	MLEP, MCI	Gov, GEF	0.1
Activity 4: Institutional strengthening				
3.3.4.1	To establish a legally-constituted administrative coordinating system for regular consultation among all organizations concerning implementation of the Stockholm Convention	NCCE	Gov	0.1
3.3.4.2	To develop and implement a program to strengthen the analytical capacity at selected existing laboratories for the required surveys, surveillance and monitoring program for POPs	MLEP, AMS, AAS, MCM, HRI	Gov, GEF	3.5
3.3.4.3	To strengthen the capacity of the Central Environmental Monitoring and Supervision Agency and its local stations, to provide efficient POPs monitoring	MLEP	Gov, GEF	1
3.3.4.4	To provide training for relevant officials and experts engaged in the implementation of the NIP	NCCE	Gov, GEF	1

№	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
3.3.4.5	To establish a chemical and waste management system for promoting and monitoring the implementation of NIP, as well as other chemical and waste related international agreements	NCCE, MCI, MLEP	Gov	0.3
3.3.4.6	To establish, on the basis of the current capacity of industrial technical institutes and the environment protection institute, a research institute to conduct research on the alternatives for POPs, as well as other hazardous organic chemicals produced in the DPR Korea	MCI, MLEP, AS	Gov, GEF	1
3.3.4.7	To establish, on the basis of the current capacity of research institutes, a research institute to conduct research on POPs impact on human health	MPH, AMS	Gov, GEF	1
3.3.4.8	To establish, on the basis of the current capacity of technical institutes, a research institute to conduct research on the rehabilitation/remediation of contaminated sites and the effects of POPs on the environment, as well as other hazardous organic chemicals used in the DPR Korea	AAS	Gov, GEF	1
3.3.4.9	To further strengthen a national system of registering and authorizing pesticides for the safe management of POPs pesticides and their alternatives	MA, AAS	Gov, GEF	0.5
3.3.4.10	To establish, on the basis of the current capacity of technical institutes, a research institute to conduct research into BAT and BEP measures for reduction of unintentional POPs release	MLEP, MMtI	Gov, GEF	1
Activity 5: Elimination of PCBs use, management of the waste				
3.3.5.1	To take measures to convert the production process of transformers containing PCBs to the one of producing PCBs-free transformers	MMI	Gov, GEF	2
3.3.5.2	To take measures to convert the production process of circuit breakers containing PCBs to the one of producing PCBs-free circuit breakers	MMI	Gov, GEF	1

№	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
3.3.5.3	To take measures to establish and introduce the process of producing PCBs-free hydraulic equipment	MMI	Gov, GEF	1
3.3.5.4	To take measures to establish and introduce the process of producing PCBs-free capacitors	MEPI	Gov, GEF	1.5
3.3.5.5	To take measures to establish and introduce the process of producing PCBs-free insulating paints	MCI	Gov, GEF	1
3.3.5.6	To take measures to gradually phase out the use of PCBs in the maintenance of heat exchangers and other machines, and start using their alternatives	MCI, MMI, relevant agencies	Gov, GEF	1
3.3.5.7	To identify and label PCBs-containing equipment	MEPI, MMI, MMtI, relevant agencies	Gov, GEF	1
3.3.5.8	To identify and label PCBs waste in the sectors of PCBs production and use	MCI, MLEP, MMI, relevant agencies	Gov, GEF	0.2
3.3.5.9	To safely manage, replace and dispose of PCBs-containing equipment	MEPI, MMI, MMtI, relevant agencies	Gov, GEF	4
3.3.5.10	To safely dispose of PCBs waste in the sectors of production and use	MCI, MLEP, MMI, relevant agencies	Gov, GEF	1
Activity 6: Elimination of POPs Pesticides use, management of the waste				
3.3.6.1	To take measures to gradually phase out the use of HCB and start using their alternatives	MPH, AMS, MA, AAS	Gov, GEF	3
3.3.6.2	To take measures to gradually phase out the use of DDT and start using their alternatives	MPH, AMS, MA, AAS	Gov, GEF	3
3.3.6.3	To take measures to establish and introduce the HCB-free process of producing an herbicide and a plasticizer.	MCI	Gov, GEF	10

№	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
3.3.6.4	To identify the total volume of POPs pesticides stock and eliminate them in an environmentally friendly and safe manner	MPH, AMS, MA, AAS, MCI	Gov, GEF	2
3.3.6.5	To accurately assess and establish inventories of the POPs pesticides waste and eliminate them in an environmentally friendly and safe manner	MPH, AMS, MA, AAS, MCI	Gov, GEF	2
<i>Activity 7: Elimination of POPs production</i>				
3.3.7.1	To take measures to dismantle the PCBs production process and establish a new process of producing an alternative	MCI	Gov, GEF	10
3.3.7.2	To take measures to dismantle the TCB production process and establish a new process of producing an alternative	MCI	Gov, GEF	7
3.3.7.3	To take measures to dismantle the HCB production processes and establish new processes of producing an alternative	MCI, MPH	Gov, GEF	10
3.3.7.4	To take measures to dismantle the DDT production process and establish a new process of producing an alternative	MCI	Gov, GEF	10
3.3.7.5	To take measures to dispose of contaminated equipment and remediate contaminated sites in an environmentally sound manner in POPs production plants	MCI, MPH	Gov, GEF	4
<i>Activity 8: Identification and management of contaminated sites and articles</i>				
3.3.8.1	To identify contaminated sites and carry out preliminary sampling to measure their contamination level	MLEP	Gov, GEF	2
3.3.8.2	To develop a program including the measures for environmentally sound management and disposal of all contaminated products and materials having the contamination level beyond national tolerance limits	MLEP	Gov	0.1
3.3.8.3	To completely dispose of contaminated materials and products	MLEP, relevant agencies	Gov, GEF	6

№	Description	Responsible agencies	Financial resources	Incremental costs (in Million US\$)
3.3.8.4	To identify and prioritize the areas, which should be rehabilitated/remediated due to their contamination level, and develop a rehabilitation/remediation program	MLEP	Gov	0.2
3.3.8.5	To rehabilitate/remediate the contaminated sites, giving priority to the high level contamination areas	MLEP, relevant agencies	Gov, GEF	10
Activity 9: Reduction of unintentional POPs emissions				
3.3.9.1	To complete UNEP Toolkit-based inventories of unintentional POPs releases and start to create monitoring in priority sectors for implementation of BAT and BEP	MLEP, MMtI	Gov, GEF	2
3.3.9.2	To identify and implement BAT and BEP measures in pilot production units in selected priority sectors	MMtI, MEPI, MCBI, MCI, MCM, relevant agencies	Gov, GEF	10
Total:				119.1

Conclusion

In the DPR Korea, POPs related issues are multifaceted and there is a pressing necessity to address them in a very near future.

All POPs related issues, including production, use and releases of intentional and unintentional POPs, could only be tackled successfully by the energetic efforts of all relevant agencies providing sufficient legal and administrative commitments and support, as well as the required human, technical and financial resources.

Though the POPs related issues are even in long term challenging to be dealt with, it is the resolute will of the government of the DPR Korea to improve POPs state in a near future, contributing to the improvement of human health and the environment at a national, regional and global level and fulfilling its duties under the Stockholm Convention.

Under the right policy of the government making all endeavors for the promotion of health and environment protection, the POPs related issues in the DPR Korea will be settled positively contributing to the human health and environment protection as well as to the overall economic development and the improvement of the people's livelihood.

Annex (Glossary/Abbreviations)

AAS	Academy of Agricultural Science
AMS	Academy of Medical Science
AS	Academy of Sciences
BAT	best available techniques
BEP	best environmental practices
CBB	chloro-butoxy-benzene
COP	the Conference of the Parties
DPR Korea	Democratic People's Republic of Korea
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
Gov	the Government of the Democratic People's Republic of Korea
HCB	hexachlorobenzene
HCH	hexachlorocyclohexane
HRI	Hygienic Research Institute
jongbo	1 jongbo = 0.991768 hectare
MA	Ministry of Agriculture
MCBI	Ministry of Construction and Building-materials Industry
MCI	Ministry of Chemical Industry
MCM	Ministry of City Management
MEPI	Ministry of Electric Power Industry
MLEP	Ministry of Land and Environment Protection

MMI	Ministry of Machine Industry
MMtI	Ministry of Metal Industry
MPH	Ministry of Public Health
NCCE	National Coordination Committee for the Environment
NGO	Non Governmental Organization
NIP	National Implementation Plan
NQSB	National Quality Supervision Bureau
PCBs	polychlorinated biphenyls
PCDD	polychlorinated dibenzo-p-dioxins
PCDF	polychlorinated dibenzofurans
PCP	pentachlorophenol
POPs	persistent organic pollutants
R&D	research and development
SAICM	Strategic Approach to International Chemical Management
TCB	trichlorobenzene
TEQ	toxic equivalents
UN	United Nations
UNEP	United Nations Environment Programme
U-POPs	unintentional persistent organic pollutants