ICELAND

National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants

Contents

Executive Summary

Persistent Organic Pollutants (POPs) are substances that pose threat to human health and the environment by possessing toxic characteristics and being bioaccumulative. Their persistence and proneness to long-range transport and deposition have made the substances ubiquitous in the environment, resulting in significant quantities in wildlife even in areas such as the Arctic, far from the sources of the contamination. Owing to the transboundary transport of POPs, a global effort is needed in order to deal with the problem by agreeing on minimizing or eliminating the releases of POPs to the environment.

Iceland ratified the Stockholm Convention 29 May 2002 and the Convention entered into force 17 May 2004. The Convention obliges Parties to reduce or eliminate releases from twelve chlorinated POPs, both substances that are intentionally used, i.e. aldrin, chlordane, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, DDT and PCBs, and substances that are released unintentionally, i.e. dioxins and dibenzofurans, hexachlorobenzene and PCBs.

Each Party to the Stockholm Convention shall develop and transmit to the Conference of the Parties an implementation plan for meeting its obligations under the Convention. An action plan shall be developed and implemented as part of the implementation plan for reduction or elimination of releases from unintentional production.

Legislation

Regulation set in 1996 imposed a ban on the import and uses of all nine pesticides listed under the Convention with the exception of mirex, banned in 1998. Production of the pesticides or PCBs has never occurred in the country. Import and uses of PCBs and equipment containing PCBs were banned by regulation in 1988. Current regulation from 1998 prescribes completion of disposal and cleaning of PCB containing equipment before the end of 2010.

Operating permits are required for installations that may cause pollution. Application of best available techniques (BAT) is demanded in sectors where the techniques have been

described and emission limits should be set. Emission limits values for dioxins and dibenzofurans from waste incineration have been set by regulation.

Iceland already meets its obligations under Convention to take measures by passing acts and setting regulations to reduce or eliminate releases of the listed chemicals.

Status

Research and monitoring show that POPs are widespread in the marine environment and that POPs accumulate in top predators. While concentrations of POPs in Arctic charr and sediments from the greatest lake in Iceland are at or close to their analytical detection limits and the levels are low in residential terrestrial and fresh water birds, POPs are more concentrated in seabirds and levels are high in the Icelandic gyrfalcon. Measurement of POPs in edible muscle part of marine fish from Icelandic waters show that levels are well below limits set for consumption. Presence of the POP pesticides in the Icelandic environment is a result of long-range transportation since historical local uses of the substances are negligible. Emissions of PCDD/PCDF have decreased substantially since 1990, owing largely to decreased emissions from waste incineration. Efforts to phase-out uses of PCB containing transformers began in the 1980s. A check is made of PCBs in remaining equipment when removed from use.

Actions

Two new projects have the purpose to gather information about potential sources of contamination; a project aimed at identifying contaminated sites and a project to clarify past uses of PCBs in products, especially in buildings materials. While concentrations of POPs in commonly consumed seafood do not warrant special recommendations, information is lacking regarding traditional local consumption habits. These habits will be studied with focus on POP intake. A new regulation on contaminated soil will be set and preparations finalized for transposition of Regulation (EC) No 850/2004 on Persistent Organic Pollutants and amending Directive 79/117/EEC, into Icelandic legislation. Construction of a landfill for contaminated soil and certain hazardous wastes will enable improved local management of these wastes. Iceland will assist financially by contributing to the Global Environment Facility.

1 Introduction

This implementation plan was prepared by the Environment and Food Agency of Iceland in cooperation with the Ministry for the Environment. The elements recommended in the UNEP interim guidance for developing a national implementation plan were used as a structure for the plan. After the executive summary and introduction the document is thus divided into the following two main sections:
Section 2, with information about geography, government and economy, policy and legislation, approaches and management procedures. The section also provides an assessment of the POPs issue in Iceland.
Section 3, which contains the strategy and action plan elements of the implementation plan.
References, abbreviations and acronyms are listed after Section 3.

2 Country baseline

2.1 Country profile

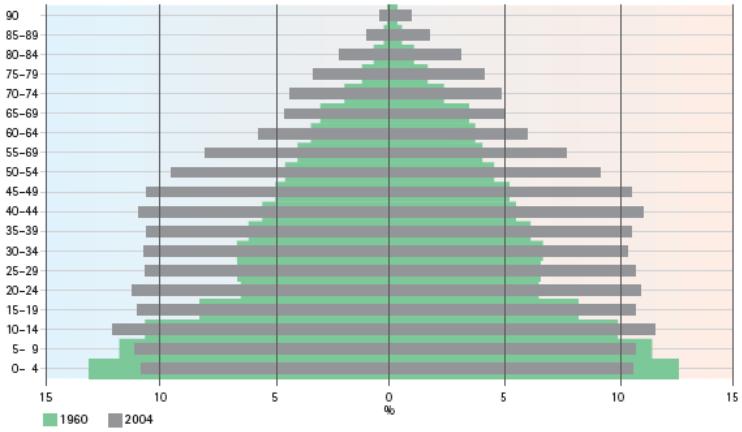
2.1.1 Geography and population

Iceland is located in the North Atlantic between Norway, Scotland and Greenland. It is the second-largest island in Europe and the third largest in the Atlantic Ocean, with a land area of some 103 thousand square kilometers, a coastline of 4,970 kilometers and a 200-nautical-mile exclusive economic zone extending over 758 thousand square kilometers in the surrounding waters.

Iceland is situated just south of the Arctic Circle but enjoys a warmer climate than its northerly location would indicate because a part of the Gulf Stream flows around the southern and western coasts of the country. Relatively mild winters and cool summers characterize Iceland's oceanic climate. The average monthly temperature varies from -3 to +3 °C in January and from +8 to +15 °C in July. Storms and rain are frequent, with annual precipitation ranging from 400 to 4000 mm on average annually, depending on location.

Geologically, the country is very young and bears many signs of still being in the making. Iceland is mostly mountainous and of volcanic origin. Glaciers are a distinctive feature of Iceland, covering about 11% of the total land area. The largest glacier, also the largest in Europe, is Vatnajökull in Southeast Iceland with an area of 8,300 km^2. Glacial erosion has played an important part in giving the valleys their present shape, and in some areas, the landscape possesses alpine characteristics. Regular monitoring has shown that all glaciers in Iceland are presently receding. Rivers and lakes are numerous in Iceland, covering about 6% of the total land area. Freshwater supplies are abundant, but the rivers flowing from the highlands to the sea also provide major potential for hydropower development. Geothermal energy is another domestic source of energy.

The population of Iceland is close to 310 000 inhabitants. The country is the most sparsely populated in Europe with a population density of three inhabitants per square kilometer. The population is projected to grow by about 12% over the next two decades, reaching around 325 000 in 2020. More than 60% of the nation lives in the capital, Reykjavik, and surrounding areas. In 1990 this same ratio was 57%, demonstrating higher population growth in the capital area than in smaller communities and rural areas. Almost four-fifths of the country is uninhabited and mostly uninhabitable, the population therefore being concentrated in a narrow coastal belt, valleys and the southwest corner of the country.



Population by sex and age 1960 and 2004

Iceland has access to rich marine resources in the country's 758,000-km^2 exclusive economic zone. The abundance of marine plants and animals results from the influence of the Gulf Stream and the mixing of the warmer waters of the Atlantic with cold Arctic waters. Approximately 270 fish species have been found within the Icelandic 200-mile exclusive economic zone; about 150 of these are known to spawn in the area.

2.1.2 Political and economic profile

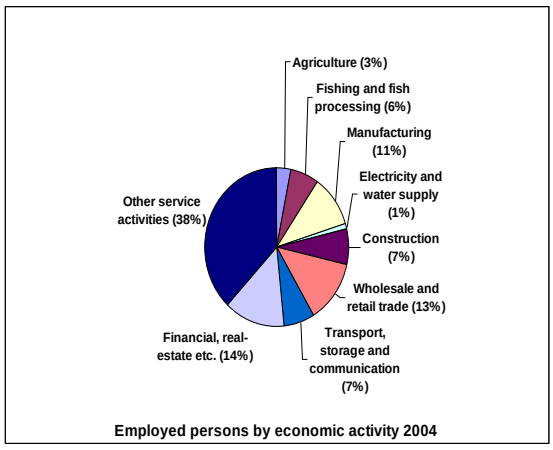
Iceland has a written constitution and is a parliamentary democracy. A president is elected by direct popular vote for a term of four years, with no term limit. Most executive power, however, rests with the Government, which must have majority support of Althingi, the Parliament. Althingi has 63 members, and parliamentary elections are held every four years. The government is headed by a prime minister, and the executive branch is currently divided among 12 ministers. Judicial power lies with the Supreme Court and the district courts, and the judiciary is independent. The country is divided into 79 municipalities, and local authorities are elected every four years. The largest municipality is the capital, Reykjavík, with approximately 118,000 inhabitants, but the greater capital area has over 180 thousand inhabitants in 8 municipalities. The smallest municipality has only 64 inhabitants. The tasks of local authorities have grown increasingly complex in recent years. The local authorities have their own sources of revenue and budgets and are responsible for various important areas. This includes physical planning, granting industry licenses, environmental and food inspection and the design and operation of public transport. Municipalities also play an important role in education.

Iceland is endowed with abundant natural resources. These include the fishing grounds around the island, within and outside the country's 200-mile exclusive economic zone. Furthermore, Iceland has abundant hydroelectric and geothermal energy resources. Policies of market liberalization, fiscal consolidation, privatization and other structural reforms were implemented in the late 1980s and 1990s, including membership of the European Economic Area by which Iceland was integrated into the internal market of the European Union.

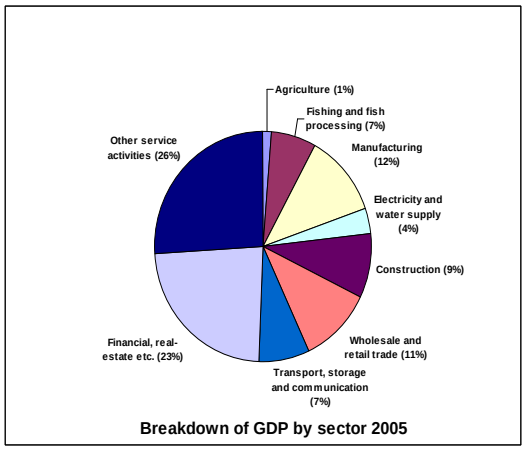
Large-scale investment projects in the aluminum and power sectors which commenced in 2003 are well under way. When these projects are completed in late 2008, the total production capacity of aluminum smelters in Iceland will be 765,000 tons per year, up from 270,000 in 2005 and 90 thousand in 1995. Power capacity needs to be stepped up by 130% to accommodate the increase. Relative to the size of the Icelandic economy these investment projects are very large. The Icelandic economy is the smallest within the OECD, reflecting the small population size, generating GDP of €10.2 billion in 2004. GNI per capita measured in terms of Purchasing Power Parities amounted to 32.4 thousand USD in 2004, the ninth highest in the world and the sixth highest among the OECD countries.

2.1.3 Profiles of economic sectors

The basic sectors of the economy are private and public services accounting for 67% of the Gross Domestic Product (GDP) and employing 72% of the workforce. Manufacturing accounted for 12% of the GDP, construction for 9%, and fishing and fish processing for 7% (1). The development over time has been a relative growth in the service sectors while agriculture and the fisheries industries decreased. The relative sizes of financial and other service of GDP increased from 39% in 1990 to 50% in 2005 while the combined contribution of agriculture and fisheries decreased from 17% to 8% in the same period.



Employed persons by economic activity 2004



Breakdown of GDP by sector 2005

Export is mainly based on fisheries products and the manufacturing industries constituting over 95% of the export value. The relative size of the contribution of these sectors to export shifted in the period from 1991 - 1995 to 2004. Manufacturing products were 35% and marine products 60% of exports in 2004 compared with 18% and 77% respectively in the period 1991 - 1995. The main reason for the change is increased capacity in the aluminum industry.

2.1.4 Environmental overview

Environmental burdens associated with local releases of POPs in Iceland are small owing to the low population density, lack of major industrial sources and limited agriculture. Cold climate is characteristic for the sub arctic location of the country with unstable weather and a growing season limited to three months. Agriculture has therefore mainly been based on growing grass for animals to produce meat and dairy products, requiring little use of pesticides. No local uses are known for five of the pesticides listed in annex A. Other pesticides, except DDT, were not used after 1970. Uses of DDT after 1975 were limited to treatment of horses and the substance was banned in 1996. POPs chemicals have never been produced in Iceland. Potential local releases of PCBs therefore stem from uses of the substances that have mainly been in electric equipment. Main local sources of dioxins and dibenzofurans in the past were uncontrolled open burning of waste, which was widely practiced before 1995.

Meteorological conditions favor westerly winds over the North Atlantic. Easterly winds carrying air masses from Europe are considerably less frequent (2). Therefore, the main origins of POPs deposited in Iceland as a result of long-range air transport are likely to be the North American Continent. Dominant POPs contaminants in fish muscle from Icelandic waters are PCBs, DDT and toxaphene. The presence of toxaphene illustrates the importance of the long-range transport to the area.

The main concerns regarding POPs i.e. human exposure, sensitive animal species and use of natural resources are all linked to the contamination levels in marine biota. Monitoring shows that POPs levels in edible parts of fish catches from Icelandic waters are well within the limits set for consumption. Toxaphene, chlordane and dioxin levels have, however, been exceeded for fish oil (blue whiting) used for feed. Elevated levels in blue whiting not observed in other pelagic fish, capelin and herring may be related to the physiology and the migratory nature of the species.

2.2 Institutional, policy and regulatory framework

2.2.1 Environmental policy, sustainable development policy and general legislative framework

A first comprehensive environmental policy, Towards Sustainable Development, was prepared in Iceland in 1993, largely based on decisions made at the UN Conference on Environment and Development in Rio de Janeiro in 1992. The strategy was followed by an implementation plan in 1996. Current strategy, Welfare for the Future, Iceland's National Strategy for Sustainable Development 2002 - 2020, is a general framework for policies set by authorities relating to sustainable development (3). Main purposes with the Strategy are to set long-term goals, set priorities for the near future and to define and develop criteria to measure progress. Regular updates of the Strategy contain goals for shorter time-frames, the most recent with main goals for 2006 - 2009.

Main drivers for the rapid development of environmental legislation in Iceland since 1990 have been the establishment of the Ministry for the Environment that year,

international agreements and participation in the European Economic Area. The environmental legislation has undergone major changes since the foundation of the Ministry for the Environment 1990. Main environmental principles are embedded in the legislation where they act as framework. Examples are the preventive principle, the polluter pays principle and environmental impact assessment as a national instrument. Economic incentives have been used to a certain extent in Iceland, for instance with the levy of a fee on hazardous waste and a deposit fee on disposable beverage containers. Acts set by the Parliament are relatively open and allow for certain latitude for the Executive to issue regulations for policy setting and implementation. With the membership of the European Economic Area, Iceland is committed to introduce European legislation, e.g. in the fields of pollution prevention and chemicals.

The main objectives for the goal of an environment free of hazardous materials, set forth in the National Strategy for Sustainable Development are:

- The use of chemicals and chemical products should not threaten the environment or human health
- Consumers should have access to conclusive information on how to utilize products with chemicals, and information on potential hazards that may arise from chemicals in the product.
- The use of biocides and pesticides should be decreased
- The disposal of materials hazardous to health and the environment should be limited as much as possible, and cease completely within 25 years.

2.2.2 Roles and responsibilities of ministries, agencies and other governmental institutions

The Ministry for the Environment is responsible for the implementation of the Stockholm Convention and coordinated national policymaking in cooperation with the Ministries of Agriculture, Industry and Commerce, Transport and Communications, Fisheries, Finance, Foreign Affairs and the Prime Minister's Office. The Environment and Food Agency of Iceland prepared the national implementation plan in cooperation with the Ministry for the Environment.

Operating permits for installations that may cause pollution, i.e. industries and waste operators, are issued by the Environment and Food Agency and by local municipal environment authorities depending on the type and size of the operation. These authorities are also responsible for inspections and ensuring that relevant monitoring is carried out.

Monitoring programs receive funding through the Ministry for the Environment. The Environment and Food Agency administers funding of the different monitoring programs.

Governmental funding for monitoring the occurrence of POPs in humans and the environment is channeled to different projects by the Ministry for the Environment through the Environment and Food Agency.

The Administration of Occupational Safety and Health in Iceland under the Ministry for Social Affairs is responsible for enforcing legislation regarding workers safety.

2.2.3 Relevant international commitments and obligations

Iceland is a party to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, and has ratified the POPs protocol of the Convention on Long-Range Transboundary Air Pollution (CLRTAP).

Iceland is a member of the OECD and EFTA. Since 1994, the Agreement on the European Economic Area (EEA) has been in force between the European Union and Iceland, Norway and Liechtenstein. With the EEA agreement most of the environmental legislation of the three EFTA countries is harmonized with that of the member states of the European Union.

Iceland has ratified the Convention for the Protection of the Marine Environment of the North-East Atlantic (the "OSPAR Convention). Iceland became a member of the International Maritime Organization (IMO) in 1960 and is a party to the Convention for the Prevention of Pollution from Ships (MARPOL 73/78, Annexes I, II, III and IV), the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, the Convention on Civil Liability of Oil Pollution Damage, the Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage and the Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. Iceland is a party to the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction. Iceland is also a party to the Copenhagen Agreement, a regional Nordic countries agreement concerning co-operation in measures to deal with pollution of the sea by oil and other harmful substances.

Iceland was one of the founders of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities within the United Nations Environmental Programme. The programme is an intergovernmental programme that addresses the inter-linkages between freshwater and coastal environment.

2.2.4 Description of existing legislation and regulations addressing POPs

Manufactured chemicals

Regulation No 323/1998, on import, uses and disposal of PCB, PCT and environmentally dangerous substitutes, based on the Act on Toxic and Hazardous Substances of 1988 and the Hygiene and Pollution Prevention Act of 1998, covers management of PCBs and preparations of which PCBs are a constituent. Import and uses of PCBs, and equipment

containing PCBs, is prohibited. Disposal of PCBs and cleaning of PCB containing equipment shall be completed before the end of 2010.

Admixture of PCBs, PCTs or other hazardous wastes with waste oils is prohibited according to Regulation No 809/1999, on waste oils, based the Act on Hygiene and Pollution Prevention of 1998 and the Act on Pollution Prevention of the Sea and Coastal Areas of 2004. Preparations, including waste oils and hydraulic fluids containing more than 0.005% of PCBs shall be treated as hazardous wastes. Discarded equipment and components removed from discarded equipment containing PCBs are classified as hazardous waste according to Regulation No 184/2002, on a list of hazardous wastes and other wastes, based on the Act on Toxic and Hazardous Substances of 1988 and the Hygiene and Pollution Prevention Act of 1998.

Manufacture, import, sale or use of aldrin, chlordane, dieldrin, endrin, heptachlor, mirex, toxaphene, DDT and HCB for uses in agriculture and horticulture or for pest control is prohibited according to Regulation No 857/1999, on prohibition of uses of certain toxic and dangerous substances, based on the Act on Toxic and Hazardous Substances of 1988 and the Hygiene and Pollution Prevention Act of 1998.

Unintentionally produced POPs

Emission limits should be set and application of best available techniques is required in permits for installations issued in accordance with Regulation No 785/1999, on operating permits for installations that may cause pollution, based on the Act on Toxic and Hazardous Substances of 1988, the Hygiene and Pollution Prevention Act of 1998, the Act on Pollution Prevention of the Sea and Coastal Areas of 2004 and the Act on Genetically Modified Organisms of 1996. Dioxins and dibenzofurans are listed in the regulation among substances that should preferably be considered for setting emission limits.

Requirements made with respect to composition of wastes and emission limit values for waste incineration are set in Regulation No 739/2003, on incineration of waste, based on the Act on Toxic and Hazardous Substances of 1988 and the Act of 2003 on Handling of Waste. Air emission limit values for the sum of dioxins and dibenzofurans are 0.1 ng/Nm^3. Emission limit values for PCDD/Fs, for discharges of waste water from cleaning of exhaust gases, are 0.3 ng/l.

Regulation No 322/2002, on pollution release registers, based on the Act on Toxic and Hazardous Substances of 1988, requires facilities to report, to the Environment and Food Agency, releases of HCB to air in excess of 10 kg/year and HCB releases to water exceeding 1 kg/year. Facilities are also required to report releases of PCDD/Fs to air in excess of 0.001 kg /year (TEQ).

Food safety

Maximum allowed concentrations of PCBs in fish and meat are set in Regulation No 56/2005, on amendment of Regulation No 411/2004 on miscellaneous contaminants in foodstuffs.

Maximum allowed concentration of pesticides, including aldrin, chlordane, endrin, heptachlor, toxaphene, DDT and HCB, in fruits and vegetables are defined in Regulation No 121/2004, on pesticide residues in foodstuffs.

Maximum allowed concentrations of PCDD/Fs in animal foodstuffs and vegetable oils are set in Regulation No 662/2003, on implementation of specific EU regulations on contaminants in foodstuffs.

These regulations are based on the Act on Foodstuffs of 1995 and the Act on Toxic and Hazardous Substances of 1988.

Table 1
Maximum allowed concentration of POPs in food (mg/kg)

	PCBs	HCB	Chlordane	Toxaphene	Aldrin	Endrin	DDT	heptachlor	PCDD* + PCDF
Fish and fish products	0.2								4
Meat and meat products	0.02								1 - 6**
Tea		0.01	0.02	0.1	0.02	0.01	0.2	0.02	
Fruits, berries, nuts, vegetables, seeds				0.1	0.01	0.01	0.05	0.01	
Milk and milk products; eggs									3
Oils and fats									0.75 - 3**

*pg WHO-TEQ/g **depending on product

Waste and wastewater management

Permits are required for operation of installations for management of hazardous wastes and for transport of hazardous wastes, in accordance with Regulation No 806/1999, on hazardous wastes, based on the Hygiene and Pollution Prevention Act of 1998, and Regulation No 785/1999, on operating permits for installation that may cause pollution.

Waste acceptance criteria for landfills are set in Regulation No 738/2003, on landfill of waste, based on the Act of 2003 on Handling of Waste. Maximum allowed concentration of PCB_7 in wastes buried in landfills for inert wastes is 1 mg/kg.

Hazardous wastes are listed and criteria set for definition of hazardous wastes in Regulation No 184/2002 on a list of hazardous wastes and other wastes.

Handling and registration of hazardous wastes are prescribed in Regulation No 806/1999 on hazardous wastes, based on the Hygiene and Pollution Prevention Act of 1998.

Provisions of the Basel Convention were brought into force by implementing Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community with Regulation No 377/1994, on environmental issues in the European Economic Area. Regulation 377/1994 was repealed by Regulation No 224/2005 on entry into force of EU legislation on the supervision and control of shipments of waste within, into and out of the European Community. Regulation No 224/2005 is based the Hygiene and Pollution Prevention Act of 1998.

Regulation No 798/1999 on wastewater and management of wastewater, based on the Hygiene and Pollution Prevention Act of 1998 and the Act on Pollution Prevention of the Sea and Coastal Areas of 2004, covers collection, cleaning and discharge of wastewater from urban areas and certain activities.

Act on support for development of municipal wastewater management was launched 1995 in order to contribute with financial support from the government to the local authorities to facilitate the development of municipal wastewater discharge systems.

New regulation

Regulation (EC) No 850/2004 on Persistent Organic Pollutants and amending Directive 79/117/EEC will soon be enforced in Iceland. The objective of the Regulation is protection of human health and the environment with regard to substances subject to the Stockholm Convention and the 1998 Protocol to the 1979 convention on Long-Range Transboundary Air Pollution on Persistent Organic Pollutants.

2.2.5 Key approaches and procedures for POPs chemical and pesticide management including enforcement and monitoring requirements

Approval and registration is required for all pesticides in Iceland. The Ministry for the Environment maintains a registry and issues licenses that are required for import and sale of all pesticides. The Administration of Occupational Safety and Health is responsible for import inspection and signing import documents for pesticides. Imports of certain chemicals, including PCBs, are prohibited. Permits are required from the Ministry for the Environment for import and sale of toxic substances. Pesticides are grouped into four classes based on hazard and risk. Depending on these classes purchase and use of pesticides must be registered or a permit from the local police commissioner is required. Waste pesticides and chemicals exhibiting hazardous characteristics are classified as hazardous waste, which requires appropriate handling and disposal at licensed hazardous waste reception facilities.

Production, import, sale and use of PCBs and pesticides listed in Annexes A and B to the Stockholm Convention are prohibited.

2.3 Assessment of the POPs issue in Iceland

2.3.1 Assessment with respect to research and monitoring data

Air

Persistent organic pollutants, e.g. PCBs, DDT, HCB, HCH isomers, trans-nonachlor, trans and cis chlordane, have been monitored in air and precipitation since 1995 at Stórhöfði in the Vestman Islands off the south coast of Iceland. The measurements, reported as monthly mean concentrations, are made as part of the European Monitoring and Evaluation Program (EMEP) that involves twelve measurement sites in nine countries.

Annual mean concentration of HCB in Iceland, in 2003, was 4.3 pg/m^3, and 85% of mean monthly concentrations of HCB in the period 1995 – 2003 were less than 10 pg/m^3. Air concentrations of HCB, in 2003, ranged from 10 to 30 pg/m^3 in Northern and Southern Europe and concentrations from 30 – 80 pg/m^3 were obtained for countries in central and Eastern Europe (4).

Modeling has been used to evaluate the contribution of transboundary transport to PCDD/F and benzo[a]pyrene pollution from all sources in Europe in 2003. The evaluation shows that external sources contribute to more than 80% of mean air concentrations and deposition of PCDD/F and benzo[a]pyrene to Icelandic territory (4).

The mean air concentration of PCB-153 in Iceland in 2003 was 0.3 pg/m^3. In the period 1995 to 2003, 81% of mean monthly concentrations of PCB-153 were lower than 0.4 pg/m^3. The concentration range for PCB-153, in 2003, was between 1 and 15 pg/m^3 in most European countries. Relative importance of lighter PCB congeners was characteristic of air samples from Iceland which was explained by depletion of heavier congeners due to atmospheric deposition resulting in greater long-range transport potential of the lighter congeners (4).

Biota

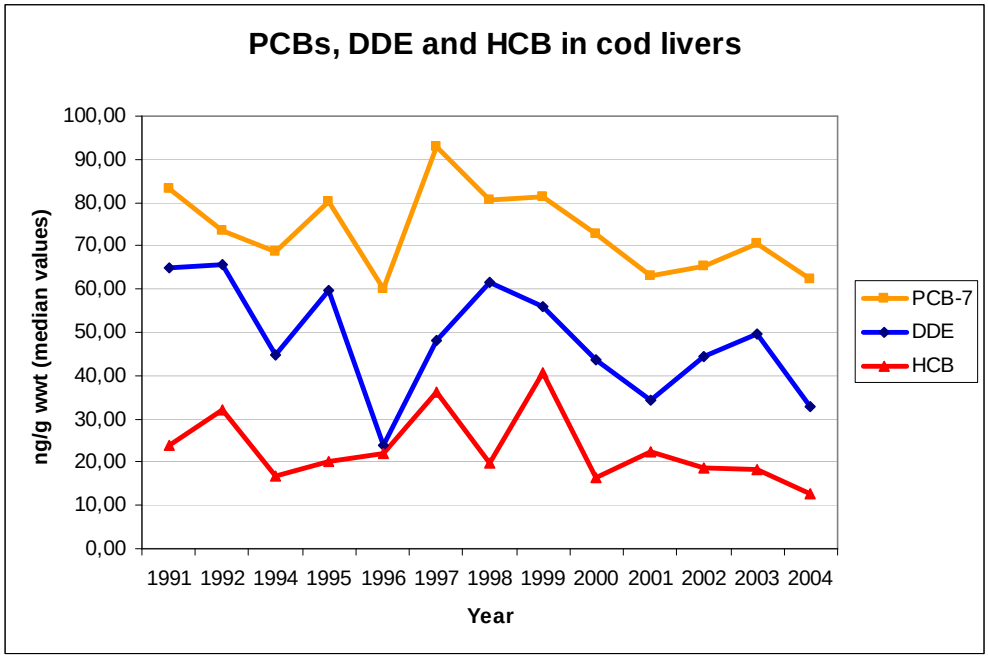
The upper bound levels of contamination of POPs in edible muscle part of fish, caught in Icelandic waters, are shown in Table 2. Median concentrations and ranges are shown for 12 species of lean fish (5). Herring and Greenland halibut are shown separately because fish with higher fat content deviate with higher contaminant levels owing to the hydrophobic nature of the POPs.

Table 2
Muscle concentrations of POPs in fish caught in Icelandic waters in 2004 (wet weight)

	Concentrations in 12 species of lean fish***			***Herring***	***Greenland halibut***	
Component	***Unit***	***Median***	***Range***			***EU***
Fat	%	0,73	0,73 - 1,52	9,93	11,8	
PCDD/F	pg/g (WHO-TEQ)	0,03	0,01 - 0,12	0,16	0,65	4
Dioxin like PCBs*	pg/g (WHO-TEQ)	0,06	0,02 - 0,33	0,3	1,4	
Marker PCBs**	ng/g	0,73	0,2 - 3,7	4,0	10,7	
DDT	ng/g	0,72	0,13 - 5,3	4,5	19,5	500
HCB	ng/g	0,3	0,06 - 0,65	0,65	3,7	50
Chlordanes	ng/g	0,42	0,15 - 1,6	2,6	9,5	100
Toxaphene	ng/g	0,94	0,18 - 5,3	6,5	24,4	
Aldrin/Dieldrin	ng/g	0,21	0,14 - 0,64	1,9	5,4	50
Endrin	ng/g	0,026	0,005 - 0,09	0,23	0,7	50
Heptachlor	ng/g	0,2	0,20 - 0,27	1,6	1,3	50
Mirex	ng/g	0,013	0,003 - 0,05	0,03	0,17	

*CB77, CB81, CB126, CB169, CB105, CB114, CB118, CB123, CB156, CB157, CB167, CB189
**CB28, CB52, CB101, CB 118, CB 138, CB 153, CB 180
*** Cod, haddock, saithe, halibut, plaice, lemon sole, dab, anglers fish, tusk, ling, redfish

POPs have been monitored in the Icelandic marine environment since 1991. The activities involve sampling of cod at four stations around Iceland and measurements of POPs in cod livers. The figure shows the median values of wet weight concentrations of PCBs, DDE and HCB in cod livers (6). Variations are considerable both within and between years. Similarities in the pattern of PCBs and DDE suggest a common pool of these contaminants, which might be sign of long range transport. A different pattern is observed for HCB. The Figure suggests downward trends in contaminant loads. Assessment of OSPAR monitoring data from the North East Atlantic confirms widespread downward trends in concentrations of hazardous substances in the area. Contaminants remain, however, above long-term targets (7).



Median concentrations of PCBs, DDE and HCB in livers of cod caught around Iceland

A temporal trend study of POPs in black guillemot, resident seabirds in Breiðafjörður bay West-Iceland, was carried out on archived samples from a 20 year period from 1976 to 1996. A slow decline was observed ($T_{1/2}$ = 12 - 20 years) in the levels of PCBs, DDE and HCB. Close correlation between PCB and DDE indicate long-range transport as a major source of the compounds (8).

High age-dependent levels of POPs in Icelandic gyrfalcon, a resident top predator, promted research into POPs levels in six prey species of birds. Lowest levels were found in residential terrestrial and freshwater birds, ptarmigan and mallard duck, while migratory birds, tufted duck and golden plover, were more contaminated. Still higher levels were found in the resident seabird black guillemot reflecting the influence of the marine habitat (9).

Measurements of POPs in Arctic charr trout and sediments from Thingvallavatn, the largest freshwater lake in Iceland, revealed concentrations at or close to the detection limits for PCBs, DDT, DDE and HCB (10).

Humans

Table 3 shows combined results of measurements of the levels of organochlorine contaminants in human blood from four geographic regions in Iceland, presented in the 2002 AMAP (Arctic Monitoring and Assessment Program) assessment of human health in the Arctic (11). Blood plasma levels of PCBs for Icelandic and Finnish mothers were intermediate for non-indigenous women in the region. Lower levels were found in Arctic Canada and higher levels in Norway, Sweden and Russia. Levels of PCBs and DDE were higher in males than females.

Table 3
Organochlorine contaminants in human blood from Iceland, 1999 (Geometric mean (range), µg/L plasma)

Substance	*Males (n=27)*	*Pregnant mothers (n=33)*
p-p'-DDT	0,07 (<0,03-0,41)	0,04 (nd-0,22)
P,P'-DDE	1,2 (0,3-4,6)	0,78 (0,26-2,4)
HCB	0,39 (0,18-0,93)	0,39 (0,18-0,76)
Toxaphene (PARLAR 26)	(nd – 0,14)	(nd-0,09)
Toxaphene (PARLAR 50)	0,05 (nd-0,23)	0,05 (nd-0,2)
PCB_{14}*	2,6 (1,4-5,5)	1,7 (0,76-3,9)
$PCB_{Aroclor1260}$	6,2 (3,0-6,2)	4,1(1,7-9,6)

*Sum of CB28, CB52, CB99, CB101, CB105, CB118, CB128, CB138, CB153. CB156, CB170, CB180, CB183, CB187
Source: (11)

Risk assessment of the exposure of the POPs was made in the AMAP report and Health Canada guidelines used for interpretation purposes. Two levels were defined for pregnant women, 'Level of Concern', i.e. blood $PCB_{Aroclor1260}$ above 5 µg/L, and 'Action Level' above 100 µg/L. Percentage exceedance of the 'Level of Concern' ranged from 22% to 50% in the Icelandic cohort depending on geographical region. Corresponding values for northern regions of Norway, Sweden and Finland were 70%, 68% and 7.7% respectively. 'Action levels' were not exceeded.

2.3.2 Assessment with respect to Annex A and B chemicals

The uses of the nine Stockholm Convention organochlorine pesticides and restrictions that have been applied to their uses are shown in Table 4. The compounds have never been produced in Iceland. Five compounds, dieldrin, endrin, heptachlor, mirex and toxaphene are not known to have ever been used in Iceland. Two compounds, aldrin and chlordane were probably used before 1970. The uses of DDT were limited after 1975 to the treatment of scabies in horses. A ban was imposed on the uses of DDT in 1996.

Table 4 **Annex A and B chemicals**		
Chemical	**Restricted use**	**Banned**
Aldrin (CAS: 309-00-2)	Never registered. Was probably used between 1940/50 - 1960/70	Banned 1996
Chlordane (CAS: 57-74-9)	Never registered. Was probably used between 1940/50 - 1960/70	Banned 1996
Dieldrin (CAS: 60-51-1)	Never registered	Banned 1996
Endrin (CAS:72-20-8)	Never registered	Banned 1996
Heptachlor (CAS:76-44-8)	Never registered	Banned 1996
Mirex (CAS: 2385-85-5)	Never registered	Banned 1998
Toxaphene (CAS: 8001-35-2)	Never registered	Banned 1996
DDT (CAS: 50-29-3)	Never registered	Banned in 1996.
Hexachlorobenzene (CAS: 118-74-1)	Never registered	Banned in 1996
Polychlorinated biphenyls (PCBs)	Used in electrical equipments and sealing material	See description of relevant regulation in section 2.2.4.

2.3.3 Assessment with respect to Annex A, part II chemicals (PCBs)

An effort was made in Iceland in the 1980s to eliminate PCBs in electrical equipment. Transformers have routinely been checked for PCBs since then in connection with maintenance. From 1988 to 2004 close to 200 tons of PCB contaminated oil and equipment have thus been identified and destroyed by incineration.

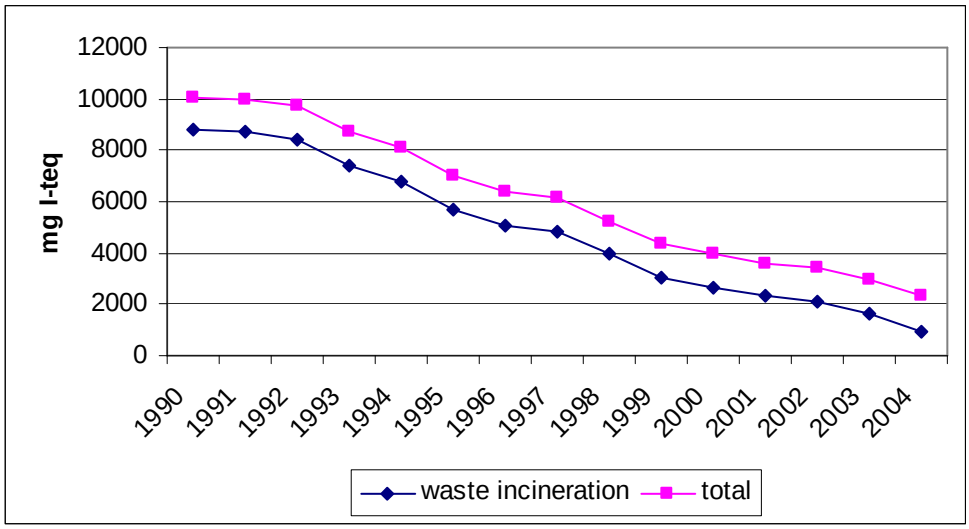
About 7000 transformers are in use in the country and 82% of these are either new equipment or transformers that have been checked for PCBs. All large equipment has been checked. Equipment that remains to be checked is owned by two major power suppliers in Iceland. These are mainly small transformers used in rural areas containing less than 100 kg of oil. The distribution system is continually being renewed and pole mounted transformers are disappearing. The transformers are checked for PCBs as they are removed from use.

Other uses of PCBs, e.g. in fluorescent light ballasts, caulk and double-pane insulating glass have not been documented. PCBs have never been produced in Iceland.

2.3.4 Assessment of releases form unintentional production of Annex C chemicals

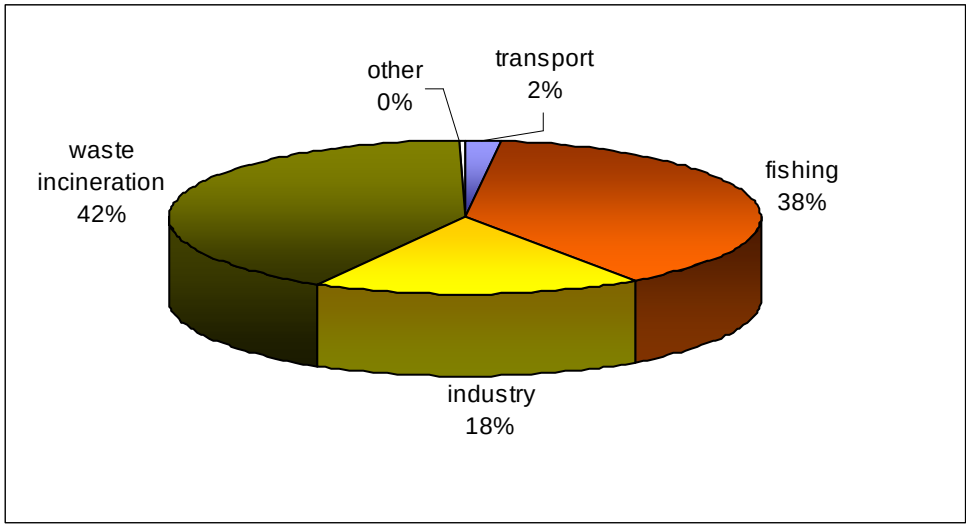
Release estimates

Total releases of PCDD/PCDF into air during 1990 – 2004 decreased from 10 g I-TEQ in 1990 to 2.4 g in 2004 (12). The trend which is depicted in the figure shows that decreased emissions can largely be accounted for by decreased emissions from waste incineration. The total amount of incinerated waste decreased during the period and open burning of waste ceased almost completely.



Trends in PCDD/PCDF emissions during 1990 - 2004

The relative importance of PCDD/PCDF sources, in 2004, is shown in the figure below (12). Waste incineration accounted for the largest part, 42%, followed by emissions from the fisheries fleet, 38%, industry, 18% and transport, 2%. The fisheries fleet is, interestingly, a significant source owing to higher emission factors for combustions engines at sea, where the inlet air contains salt (chloride).



Relative importance of PCDD/PCDF sources in 2004

Waste incineration

Landfills are the main route for waste disposal in Iceland. In 2004, 346 000 tons of waste were landfilled, whereas 14350 tons of waste were disposed of by incineration. Incineration was discontinued at four sites during 2004 resulting in 43% cut in PCDD/PCDF emissions from waste incineration between 2004 and 2005. Waste was incinerated at six sites in 2005, processing 17000 tons of waste. Estimated total emissions of PCDD/PCDF from incineration that year, was 0.55 g I-TEQ.

By Decision No 57/2003 of the EEA Joint Committee the EEA Agreement was amended to incorporate Directive 2000/76/EC on the incineration of waste. The Decision includes adaptations for five of the above incinerators which are located in peripheral areas and treat less than one ton of waste per hour. Dioxins shall thus be subject to a non-recurring single measurement. Directive 2000/76/EC was implemented with Regulation No 739/2003, on incineration of waste.

Industrial processes

The main industrial sources of PCDD/PCDF are production of non-ferrous metals, i.e. primary aluminum and ferrosilicon production. Closed prebake systems with point feeding of alumina are used at the aluminum smelters. The prebaked anodes are imported. These industries fulfill requirements of applying best available techniques as described in the IPPC Reference Document on Best Available Techniques in the Non Ferrous Metals Industries and the POPs protocol to CLRTAP.

2.3.5 Information on contaminated sites and wastewater

Contaminated sites

Contaminated sites are potential sources of persistent organic pollutants to the marine environment. Untreated leachates from landfills, containing transformers and other electric equipment with PCB oils or dioxin contaminated fly ashes from waste incineration flue gas cleaning, may contribute to contamination of coastal areas. Contaminated industrial sites located close to the sea or rivers can also be potential sources. The organic contaminants do not, however, dissolve easily in water and they have a tendency of attachment to particles which reduces the risks of water contamination.

Overall assessment of contaminated sites has not been conducted in Iceland. Individual case studies have however been made in the Reykjavík area. A scrap yard in Reykjavik's harbor area, known to be contaminated with PCB oils and dioxins/dibenzofurans from cable burning was cleaned several years ago by removing the contaminated topsoil. An effort was made at the Environment and Food Agency to collect information about potentially contaminated sites by sending out questionnaires to local health authorities. The survey produced information about old landfills that have a potential of being contaminated.

Municipal wastewater

Studies were made of the chemical composition of wastewater and caged mussels deployed along the ocean outfall in relation to the construction of the municipal sewage system in Reykjavík.

The concentration of PCBs, DDE and HCB in mussels decreased with distance from land, reaching background values 4.5 – 5 km from the shore. The concentrations closest to the shore were generally a factor of 3 – 5 above the background. Measurements of PCBs in the wastewater, made in 1993 and 2000/2001, showed that concentrations had decreased by a factor of 10 – 100 during that period. Significant changes in the concentrations of the POPs in caged mussels were not observed between 1993 and 2000, with one exception where the levels close to land have declined (13).

2.3.6 Future production and requirements for exemptions

Production and uses of POPs are prohibited in Iceland and no exemptions are required.

2.3.7 Programs for monitoring releases and environmental and human health impacts

Environment and Food

Annual monitoring of the marine biosphere around Iceland began in 1989. The program is coordinated by the Environment and Food Agency. The Icelandic Fisheries Laboratories (IFL) coordinates the monitoring and is responsible for sampling, preparation, chemical analysis and reporting of results. The program includes measurements of PCBs, HCHs, DDTs, toxaphene, chlordanes, transnonachlor and trace metals in cod and blue mussels. The data is submitted to the ICES databank in Copenhagen and a full report is made available for the public at IFL's website.

The Icelandic Meteorological Office participates since 1980 in the European Monitoring and Evaluation Programme (EMEP) with daily monitoring of sulphur in precipitation and air at Irafoss and since 1995 in the Comprehensive Atmospheric Monitoring Programme (CAMP) with two weekly monitoring at Storhöfdi of both heavy metals and PCBs, DDTs, HCB, HCHs, nonachlor and chlordanes in air and precipitation. All data is sent to the joint data base at NILU (Norwegian Institute for Air Research) where processed data can be retrieved.

A project was initiated in 2003 by the Ministry of Fisheries with a main purpose of gathering information for evaluating the status of Icelandic seafood with regard to undesirable substances. Persistent organic substances and trace elements are measured in edible parts of 14 species of fish, in fishmeal and in different fish oils intended for feeds and human consumption. The program includes measurements of dioxin-like PCBs, marker PCBs, PCDD/PCDF, HCB, DDTs, HCHs, aldrin, endrin, dieldrin, chlordanes, toxaphene, endosulfan, PAHs and brominated flame retardants. Reports with results from three consecutive years were available at IFL's website in 2006 (5).

The Agricultural Authority of Iceland, under the Ministry for the Agriculture, is responsible for a program monitoring PCDD/PCDF and PCBs in meat, dairy products, farmed salmon and trout, eggs and potatoes. Yearly measurements have been made since 2003 and the results will be published in a Nordic report, Review of maximum levels for dioxins and dioxin-like PCBs, impact on the consumer exposure and the food supply, during 2007.

Humans

Levels of persistent organochlorines in samples from humans were first studied in Iceland by Ólafsdóttir et al. in 1997 (14). Levels of PCBs, HCB, HCH and DDE were studied in breast milk from Icelandic women. The studies continued with measurements of POPs, reported in the AMAP Assessment 2002: Human Health in the Arctic (11). Additional samples of maternal blood plasma were taken in 1999 and 2004 for time trend analysis.

Industry

Measurements of PCDD/PCDF are stipulated in operating permits for industries known to be significant sources of these substances. The results are reviewed by authorities responsible for environmental inspections at the facilities. The activities concerned are

included in Annex C of the Convention, i.e. waste incinerators and cement kilns firing hazardous waste.

2.3.8 Information exchange with other Parties to the Convention and systems to communicate information

Iceland has ratified the POPs protocol under the Convention on Long Range Transboundary Air Pollution (CLRTAP). In accordance with the protocol, emissions from sources in Iceland are reported to the Convention and thus made available to parties and non-parties alike.

Through the agreement with the EU on the European Economic Area (EEA-agreement) information is shared between the parties. Iceland participates currently in a project involving the EU and Norway aimed at compiling new comprehensive information about the levels of PCDD/PCDF and PCBs in agricultural products, seafood and feed. The information will be used for comparisons of contaminant levels with current standards and to revise and set limits for PCDD/PCDF and PCBs in these products.

Iceland is an active participant in Nordic Cooperation within the framework of the Nordic Council and the Nordic Council of Ministers. Working groups under the Nordic Council of Ministers plan and coordinate work within areas of air and sea, chemicals, natural life, outdoor life and cultural environment, food, products and waste products, and environmental surveillance and data. According to the Nordic Environmental Action Plan 2005–2008, proposals will be prepared to strengthen the Stockholm Convention and the POPs protocol (15). Models for the dispersion of heavy metals and POPs will also be prepared.

The Environment and Food Agency of Iceland is responsible for chemicals and chemical products with regard to overseeing regulations, harmonization of legislation in relation to the EEA-agreement and other international agreements, and dissemination of information. The Agency publishes information sheets, arranges public seminars and training courses and provides current information at its website. A committee with participation from the Agency and local health inspectorates is a venue for contacts, exchange of information and initiating implementation programs. The target groups are retailers and users of chemical products, both businesses and individuals.

2.3.9 Non-governmental organizations

The Ministry for the Environment supports financially and cooperates formally with 15 nongovernmental organizations that operate both locally and nation wide. Meetings are held regularly. The organizations are engaged in work regarding both environmental issues and nature conservation.

2.3.10 Overview of technical infrastructure for POPs assessment, measurement, analysis, and research

The Environment and Food Agency is responsible for ensuring that monitoring and research is carried out in relation to the Hygiene and Pollution Prevention Act of 1998. The Agency is furthermore responsible for monitoring the sea and coastal areas with regard to pollution in accordance with the Act on Pollution Prevention of the Sea and Coastal Areas of 2004.

The Department of Pharmacology and Toxicology of the University of Iceland carries out the measurements of POPs in two monitoring programs; the annual survey of POPs in marine biota and monitoring of POPs in air and precipitation. Recent research projects at the department include studies of POPs in birds and samples from humans.

The Icelandic Fisheries Laboratories (IFL) organizes sampling of marine biota, foods and feeds for measurements of POPs. The Laboratories compile, interpret and reports on the data collected. A report on survey of POPs in marine biota is published annually and IFL reports the results of a monitoring study of POPs in foods and feeds.

The Institute of Biology at the University of Iceland is involved in studying the occurrence and spatial distribution of POPs. The project, CAPNE - "comparative assessment of persistent organic pollutants and their metabolites, with emphasis on non-traditional contaminants, in the West-Nordic and the Baltic Proper environments", is an example of Nordic cooperation with participants from Sweden, Norway and the Faeroe Islands.

Wide range of POPs can be analyzed by laboratories in Iceland, but samples have been sent abroad for analysis of PCDD/PCDF since the laboratories do not offer these services.

2.3.11 Identification of impacted populations, threats to public health and social implications

Sustainable management of marine resources is a key component of the Icelandic economy. With marine products accounting for 60% of the total value of exported goods from Iceland in 2004, it is clear that any threat to these products may have severe consequences for workers and communities in the country. Another important concern is the negative impacts pollutants may have on the consumption of fish. Intake of fish has unequivocally been shown to have beneficial heath effects, especially towards reducing the risks of cardiovascular diseases. Two meals a week with fish as a main component is a general official recommendation in many European countries. This recommendation is regarded as a minimum in Iceland and other countries. Reduced consumption of fish caused by high levels of contaminants or because of concerns due to a tarnished image of the products may have adverse effects on the health status of whole populations.

Recent surveys of contaminants in fish most commonly consumed in Iceland show that levels of PCDD/PCDF, PCBs and pesticides are lower than set limits, by an order of magnitude or more (5). Special recommendations have thus not been issued by health authorities that limit consumption with respect to intake of POPs. The intake of POPs has however not been calculated for vulnerable groups, i.e. local populations with special dietary habits such as high consumption of wildlife, e.g. seabirds, including eggs, and marine mammals. This information is needed to be better able to issue recommendations.

2.3.12 Details of any relevant system for the assessment and listing of new chemicals

Icelandic regulation is harmonized with EU regulation with regard to assessment and listing of new chemicals, in accordance with the agreement on the European Economic Area (EEA). Directive 92/32/EC, implemented with Regulation No 815/1998 on reporting obligations for new substances, prescribes the requirements manufacturers must comply with before placing new substances on the market. These include tests, risk assessment, guidelines and provision of information.

2.3.13 Details of any relevant system for the assessment and regulation of chemicals already in the market

Council Regulation (EEC) 793/93 sets a framework for evaluation and control of existing chemical substances. The evaluation and control is seen as a four step procedure; data collection, priority setting, risk assessment and risk reduction. Council Regulation (EEC) 793/93 was implemented in Iceland with Regulation No 161/1998 on the entry into force of certain EEC legislation relating to risk estimate and control of registered substances, as part of the EEA-agreement.

3. Strategy and action plan elements of the national implementation plan

3.1 Policy statement

In accordance with Iceland’s National Strategy for Sustainable Development 2002 - 2020 an action plan will be made with the goal of reducing emissions of substances, hazardous to human health and the environment, to the extent possible (3). The precautionary principle should be the goal of the action plan and the substitution principle applied where appropriate, e.g. in agreements between industry and government, replacing hazardous chemicals with chemicals serving the same purpose without harmful side effects. International and regional agreements on chemicals and chemical products shall be taken into account and actions described for reaching the goals within the set

timeframe. The national implementation plan for the Stockholm Convention is therefore an integral part of Iceland's strategy for sustainable development.

3.2 Implementation strategy

The following subsections of the strategy and action plan correspond with minor modifications to the structure proposed in the UNEP Interim guidance. Areas where information is lacking or actions are needed are identified and actions described. A timetable is provided with a list of scheduled projects. With existing infrastructure and Icelandic legislation prohibiting chemicals and requiring best available techniques, much of the requirements of the Convention have already been implemented. An account is given of instances where further measures are not needed.

3.3 Activities

3.3.1 Institutional and regulatory strengthening measures

Regulations have been implemented in Iceland, which cover the use and management of POP substances. Operating permits are required for activities that may emit unintentionally produced POPs and emission standards have been set. Institutional framework is in place for permitting and compliance and for implementing regulations, which are to a large extent harmonized with the regulation of the European Union. A new act has been proposed and two regulations are being prepared that will further strengthen implementation of the Convention. Strengthening of the institutional framework is not necessary.

Regulation (EC) No 850/2004 on Persistent Organic Pollutants and amending Directive 79/117/EEC, is in a process of becoming part of the EEA Agreement and Icelandic legislation. The new regulation will supplement existing regulations that implement the provisions of the Stockholm Convention.

A regulation on contaminated soil is being prepared with the aim of strengthening the regulatory framework for the management of contaminated sites.

3.3.2 Measures to reduce or eliminate releases from use, stockpiles and wastes of Annex A and Annex B pesticides

Icelandic regulation prohibits production, import and use of Annex A and Annex B pesticides. Pesticides have never been produced in Iceland and the Annex A and B pesticides, with the exception of aldrin, chlordane and DDT, have never been used in the country. Aldrin, chlordane and DDT were banned in 1996.

The risks that any significant quantities of Annex A and B pesticides are stored in Iceland are considered negligible, and current regulation is sufficient to block future uses of these substances. Further measures are not viewed as needed in Iceland to eliminate releases of Annex A and Annex B pesticides.

3.3.3 Measures to reduce or eliminate releases of PCBs (Annex A, part II chemicals)

Identified uses of PCBs in Iceland are mainly as dielectric fluid in electrical transformers. Other uses, e.g. PCB containing cured caulk, paint, and seal in double-pane insulating glass, have not been documented. PCBs have never been produced in Iceland.

A drive in the late 1980s raised awareness and projects were initiated to identify and replace transformers and capacitors containing PCBs. It is estimated that approximately 82% of all transformers in use in the country are either too recent to contain PCBs or units that have been checked to be free of PCBs. These include all larger equipment, but around 1200 small transformers are still in operation. The majority of these units contain less than 100 kg of oil, and it is estimated that less than 2% contain PCB contaminated oil. With ongoing renewal of the electrical distribution system the pole mounted small transformers are gradually disappearing. The equipment is checked when removed from use.

Current regulation (No 323/1998) prohibits all uses of PCBs after 2010. The Regulation classifies oils containing more than 0,005% of PCBs as hazardous waste.

Activities:

- A study will be initiated to identify products containing PCBs , with focus on materials used in buildings
- Pending on the outcome of the study decisions will be made concerning necessary measures

3.3.4 Register for specific exemptions and the continuing need for exemptions

Iceland has not registered for specific exemptions. The general exemption in Para. 5 Art. 3, which applies to laboratory-scale quantities of the substances for research and monitoring purposes, meets the requirements of national laboratories.

3.3.5 Measures to reduce releases from unintentional production

Inventories have been made as part of Iceland’s obligations in relation to the POPs protocol to the Convention on Long-Range Transboundary Pollution, with estimates of dioxin and dibenzofurans releases from sources in Iceland. The inventories show that

releases of PCDD/PCDF decreased in the period 1990 - 2004 from 10 g I-TEQ to 2.4 g I-TEQ. The main sources of PCDD/PCDF in 2004 were waste incineration, fishing and industry. These sources accounted for 98% of the emissions that year. Decreased emissions are mainly attributable to closing of facilities for waste incineration. Releases from incineration decreased still further by 43% between 2004 and 2005. Landfilling is the main route for waste disposal in Iceland with only 4% of the wastes being incinerated in 2004. Inventories of HCB and PCB releases have not been made in Iceland.

The application of BAT is prescribed by law in Iceland for sources where best available techniques have been described. Since 1999, BAT has been a requirement for all new sources and will be a requisite for existing sources after 31 October 2007. The provisions of the Icelandic regulation are harmonized with Council Directive 96/61/EC concerning integrated pollution prevention and control. Environmental permits are required and compliance visits are mandatory. Measurements of PCDD/PCDF are prescribed in permits for relevant source categories. Regulation 739/2003 on incineration of waste, prescribes emission limit values for PCDD/PCDF; the limits are 0.1 ng/m^3 for waste incinerators and cement kilns firing waste. Emission limit values for wastewater from cleaning of exhaust gases are set at 0.3 ng/l.

Current legislation provides adequate provisions for management of releases from the source categories in Annex C.

Current inventories of PCDD/PCDF are based on estimates using the UNEP Toolkit and other available emission factors. To improve the inventories it is desirable to be able to check the emission factors against actual measurements. Measurements of PCDD/PCDF are prescribed in permits for Part II source categories; waste incinerators and cement production. Waste incinerators were the largest source of PCDD/PCDF in 2004. Data from measurements of emissions from existing waste incinerators and cement production will become available in 2007 and 2008. The main purpose is enforcement of permits and regulations but the information will also serve to improve release inventories.

The second largest source of PCDD/PCDF in Iceland in 2004 was the fishing fleet. Emission factors used for this source take into account the chloride content of the engine air intake. This source is not among categories listed in Annex C. Pollution from ships is the subject of a separate convention; The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). Annex VI to MARPOL 73/78 deals with prevention of air pollution from ships.

Industry was the third largest source of PCDD/PCDF emissions from Iceland in 2004. The main sources were production of non-ferrous metals, i.e. primary aluminum and ferrosilicon production. These industries are operated in accordance with BAT as described in the IPPC Reference Document on Best Available Techniques in the Non Ferrous Metals Industries, and the POPs protocol to CLRTAP.

Releases of PCDD/PCDF from incineration of waste will be measured in 2007 in accordance with Regulation No 739/2003 for incinerators processing less than 5000 tons of waste per year. Measurements will be made in the cement industry no later than 2008. Measures will be taken depending on the results of the measurements to ensure compliance with the regulation.

Evaluations have until now been limited to past releases of PCDD/PCDF. Evaluation of projected releases will be made during 2008.

Further measures in the non ferrous metals and the waste sector will be considered in relation to revisions of best available techniques for these sectors.

3.3.6 Measures to reduce releases form stockpiles and wastes

Wastes

Regulation 806/1999 sets the framework for management of hazardous wastes in Iceland covering packaging and labeling, classification and hazardous risk estimate, permits for waste reception facilities and transport operators, documentation, reporting and transport. Transboundary transports of wastes are subject to the provisions of the Basel Convention in accordance with Regulation No 224/2005.

Stockpiles

The occurrence of stockpiles of Annex A and B pesticides in Iceland is highly improbable.

Contaminated sites

The Act on Pollution Prevention of the Sea and Coastal Areas of 2004 prohibits dumping of wastes and other matter into the maritime area, which is in accordance with Annex 2 to the OSPAR Convention. The law is aimed at preventing placement of matter in the maritime area without authorization. Permits may be obtained from the Environment and Food Agency for dumping of dredged material and inert materials of natural origin. All dredged material must be characterized with regard to contamination and disposed of in accordance with criteria set by the competent authority.

Remediation of contaminated sites on land may be needed in connection with land use changes. Land use changes require that amendments be made to municipal or local plans. Approval by the Minister for the Environment after a proposal from the Planning Agency is a requisite for amendments of municipal plans. Local plan amendments require advertisement, procedure for accommodating objections and consultation with the Planning Agency before their adoption. The Strategic Environmental Assessment Act/ 2006, was set to promote sustainable development, reduce negative environmental impacts and to encourage that environmental issues be taken into consideration in relation with developmental planning. The law stipulates environmental assessment of development plans that have impacts on issuing of permits that fall under the Environmental Impact Assessment Act of 2000.

Activities:

- A regulation on contaminated soil is under preparation in the Ministry for the Environment will further strengthen the regulatory framework for the management of contaminated sites.
- A landfill suited for contaminated soil and certain hazardous wastes will be constructed.
- A project will be launched aimed at identifying contaminated sites. The project is also part of Iceland's program of action for the Protection of the Marine Environment from Land-based Activities
- Work will be initiated to clarify past uses of PCBs in products, especially in building materials. The study is aimed at providing sufficient insight to enable identification and proper handling of these products when they become wastes.

3.3.7 Listing of chemicals in Annexes A, B and C

Iceland recognizes the importance of the Stockholm Convention for dealing with the global threats of POPs to human health and the environment and is therefore in support of adding relevant substances to the lists in the annexes of the Convention.

Iceland participates in 2007 in a Nordic project to prepare a document on hexabromocyclododecane (HBCDD) as a possible global POP.

3.3.8 Information exchange and public awareness

The Environment and Food Agency of Iceland has been designated as a focal point for exchange of information under Article 9.

The pesticides listed in Annexes A and B have either been banned in Iceland since 1996 or never been used in the country. Information or training programs for handling the substances are therefore not considered necessary.

Information material will be prepared contingent on the outcome of the study of PCBs in building materials.

Results of annual monitoring of POPs in the marine biosphere and reports on measurements of POPs in seafood have been made public on the Internet. General information on the POPs issue is provided at the website of the Environment and Food Agency.

Consumption of fish has been traditionally high in Iceland compared with many European countries. Even if levels of POPs in seafood from the maritime area around Iceland are well within the limits set by regulation, intake studies are needed focusing on populations with special dietary habits, to be better able to estimate the risks of POPs for these groups. A study with this purpose will be started during 2008.

3.3.9 Effectiveness evaluation

The results of ongoing monitoring of POPs in the marine biota, air and precipitation, as well as targeted studies involving humans, birds and marine mammals will be used to the extent possible for effectiveness evaluation.

Additional monitoring and studies will be conducted as needed to provide monitoring data in accordance with decisions that will be made by the Conference of the Parties.

3.3.10 Research, development and monitoring

Programs are being run in Iceland focusing on the recipient by monitoring POPs in marine biota and on transport by measuring POPs in air and precipitation. The marine program provides data to OSPAR as part of the Coordinated Environmental Monitoring Program (CEMP) and the air and precipitation data are part of OSPAR's Comprehensive Atmospheric Monitoring Program (CAMP).

Monitoring of POPs in food has been carried out by the Icelandic Fisheries Laboratories (IFL). The Ministry of Fisheries initiated monitoring of edible portion of marine catches, involving over 20 species of fish and shellfish, fish oils and fish meal for feed. Main agricultural products were also monitored for the Icelandic Veterinary Services. The monitoring programs contribute to a European effort to examine how products measure up against limits, and as basis for setting limits.

The Department of Pharmacology at the University of Iceland is active in research concerning POPs in birds; falcons, eiders, guillemots. Studies have also been made of POPs in breast milk and maternal blood, the latter being a contribution to the Arctic Monitoring and Assessment Program (AMAP).

Iceland participates within the framework of the Nordic Council in work aimed at providing information for strengthening international conventions, e.g. the Stockholm Convention and CLRTAP. The projects have different character; examples are preparation of background documents such as that made for pentabromodiphenyl ether or assessments of the occurrence and spatial distribution of POPs. Preparations are being made for a background document on hexabromocyclododecane.

Continued emphasis will be placed on monitoring and research, where regional cooperation and the Arctic have special significance.

3.3.11 Technical and financial assistance

The Icelandic International Development Agency (ICEIDA) is a government agency and an autonomous department of the Ministry for Foreign Affairs. It has been ICEIDA's policy to focus its efforts on only a few areas where Icelandic expertise is thought to be most useful and where Icelanders are well advanced. Thus, the agency's major projects

have all been related to training and capacity building in fisheries, as well as fisheries research. However, recently ICEIDA has placed more emphasis on support in the health, education and social sectors. Presently, ICEIDA is engaged in development co-operation with four countries in Africa: Malawi, Mozambique, Namibia and Uganda.

Iceland will contribute to the Global Environment Facility.

3.4 Timetable for implementation

Activity	**Timeframe**
Project aimed at identifying contaminated sites	2008 - 2009
Project to clarify past uses of PCBs in products, especially in building materials	2007 - 2008
Study of the intake of POPs with food, focusing on local consumption of marine wildlife.	2008 - 2009
New regulation on contaminated soil	2008
Transposition of Regulation (EC) No 850/2004 on Persistent Organic Pollutants and amending Directive 79/117/EEC, into Icelandic legislation.	2008
Iceland will contribute to the fourth GEF replenishment	2007 - 2010
Measurements of PCDD/PCDF releases from waste incineration and cement kiln	2007 - 2008
Landfill site for contaminated soil will be established	2010

Abbreviations and acronyms

AMAP	Arctic Monitoring and Assessment Programme
BAT	Best Available Techniques
CAMP	Comprehensive Atmospheric Monitoring Programme
CAS	Chemical Abstracts Service
CLRTAP	Convention on Long-Range Tranboundary Air Pollution
DDE	Dichloro Diphenyl Ethane
DDT	Dichloro Diphenyl Trichloroethane
EEA	European Economic Area
EC	European Council
EEC	European Economic Community
EFTA	European Fair Trade Association
EMEP	Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNI	Gross National Income
HBCDD	Hexabromocyclododecane
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
ICEIDA	Icelandic International Development Agency
ICES	International Council for the Exploration of the Sea
IFL	Icelandic Fisheries Laboratories
IMO	International Maritime Organization
IPPC	Integrated Pollution Prevention and Control
MARPOL	International Convention for the Prevention of Pollution from Ships
NILU	Norwegian Institute for Air Research
OECD	Organisation for Economic Co-operation and Development
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PCB	Polychlorinated biphenyls
PCT	Polychlorinated terphenyls
PCDD	Polychlorinated dibenzodioxins
PCDF	Polychlorinated dibenzofurans
TEQ	Toxic Equivalent
WHO	World Heath Organization

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