The National Implementation Plan of Japan under the Stockholm Convention on Persistent Organic Pollutants

Modified in August 2012

This National Implementation Plan was developed by the "Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants", and endorsed by the "Council of Ministers for Global Environment Conversation" on 24 June 2005. Revision was made in accordance with Article 7 of the Stockholm Convention on the Implementation Plan and guidance of decision SC-1/12 (Annex, II 7) and process of decision SC-2/7 (Annex, Step 7) of the Conference of the Parties. The revised plan was endorsed by the "Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants" on 7 August 2012.

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Chapter 1 Introduction

Article 7 of the Stockholm Convention on Persistent Organic Pollutants (hereafter referred to as the Stockholm Convention) requires each party to the Stockholm Convention to develop its national implementation plan (NIP) for implementation of its obligations under the Stockholm Convention and to transmit its NIP to the Conference of the Parties within two years of the date on which the Convention enters into force for the Party. Upon the addition of chemicals to the annex, each party is required to review and update the implementation plan in accordance with guidance of decision SC-1/2 (Annex, II 7) and process of decision SC-2/7(Annex, Step 7) of the Conference of the Parties. In addition, Article 5 of the Stockholm Convention requires each party to develop an action plan designed to reduce or eliminate releases from unintentional production of Persistent Organic Pollutants (hereafter referred to as POPs), and to subsequently implement it as a part of its NIP.

Thus, with the addition of nine new chemicals to the annex at the fourth meeting of the Conference of the Parties in May 2009, the National Implementation Plan was reviewed and updated. In addition to the nine new chemicals, this plan also covers endosulfan which was added to the annex at the fifth meeting of the Conference of the Parties in April 2011 (entering into force on October 27, 2012).

By international cooperation and through each party's concrete actions obliged under the Stockholm Convention based on its NIP, the reduction of POPs on global scale is expected to be promoted to realize the protection of human health and the environment.

The Convention prescribes that each party should implement the following measures.

- Measures to reduce or eliminate releases from intentional production and use
- Measures to reduce or eliminate releases from unintentional production (including the development and implementation of an action plan)
- Measures to reduce or eliminate releases from stockpiles and wastes containing POPs
- To develop and implement a national implementation plan for these measures
- Other measures
    - Measures to prevent the production and use of new POPs
    - Research and development, monitoring, provision of information to the public and education on POPs etc.
    - Technical and financial assistance to developing countries.

This document is a national implementation plan of Japan under Article 7 of the Stockholm Convention and includes an action plan on unintentional products under subparagraph (a) of Article 5 of the Convention.

This document was developed in reference to the guidance document for developing a national implementation plan for the Stockholm Convention, which was prepared by United Nations Environmental Plan (hereafter referred to as UNEP) and the World Bank, and adopted by the Conference of the Parties at its first session in May, 2005.

Section 1 Background to the adoption of the Stockholm Convention and Japan's accession

POPs such as polychlorinated biphenyls (PCB) and DDT are toxic, persistent, bioaccumulative, and are transported through air, water and migratory species across international boundaries and deposited far from their location of emission and accumulate in terrestrial and aquatic ecosystems.

Therefore, it came to be internationally recognized that there are health concerns resulting from local exposure to POPs especially in developing countries, and in particular impacts upon women and through them, upon future generations, and that Arctic ecosystems and indigenous communities are particularly at risk because of the bioaccumulation of POPs through food chain, and the contamination of their traditional foods is a public health concern.

It was recognized that actions by only a limited number of countries are insufficient for the worldwide elimination and reduction of POPs. Therefore, negotiations within a multilateral framework were initiated in 1998 to draft an international convention on the elimination and reduction of POPs. In the wake of discussions and negotiations at 2 meetings of the Expert Group to define the criteria of POPs and 5 meetings of the Inter-Governmental Negotiating Committee, the Stockholm Convention was adopted at the Conference of Plenipotentiaries held in Stockholm in May, 2001.

The Japanese government has positively participated in the work to establish a legally binding international framework since the first Inter-Governmental Negotiating Committee. The Japanese government acceded to the Convention on 30 August 2002.

On 17 February 2004, the fiftieth instrument of ratification, acceptance, approval or accession to become a Party to the Stockholm Convention was submitted and the Stockholm Convention entered into force on 17 May 2004. As of March 2012, 176 countries including Japan are the contracting parties to the Convention.

Section 2 Historical Background of POPs issues in Japan

In the past, crops, water and soil contaminated with high residue level of agricultural chemicals such as DDT, aldrin and dieldrin etc. used in Japan led to social problems. Hence, the Agricultural Chemicals Regulation Law (Law No. 82 of 1948) was amended in 1971, and then the evaluation system for the residue in crops, water and soil and the toxicity was introduced on agricultural chemicals registration. Thus, in addition to the protection measures for aquatic organisms, a new regulation was introduced whereby the registration of agricultural chemicals is withheld if they may cause human health and livestock adverse effect through residues in crops or soil or through water pollution. Dieldrin and chlordane were also used as insecticides for termite control raising concerns for environmental pollution.

In 1980s, the use of these chemicals for non-agricultural purposes were regulated by prior authorization for their production and import (practically prohibited) and the restriction and notification for their use (practically prohibited), under the Law concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture etc. (Law No. 117 of 1973, hereafter referred to as the Chemicals Substances Control Law)

PCB, which possesses chemical stability, insular characteristics and incombustibility etc., has been used for a wide range of purposes including electrical insulation oil and heating medium, for transformers and electrical condensers and so on. However, ever since 1966 it has become increasingly apparent that PCB contaminates the environment as exemplified in the PCB detected in the remains of fish and birds worldwide. In Japan too, in 1968 it was disclosed that the PCB used as heating medium in the manufacturing process of cooking oil had contaminated the product, causing health hazards (the Kanemi Cooking Oil Health Hazards Incident). Subsequently, PCB came to be detected in various creatures and breast milk so that PCB contamination became a major social issue. Given this situation, the production of PCB ceased ever since 1972 and the Chemical Substances Control Law was enacted in 1973. Under the law, an institutional framework was created to evaluate in advance the chemical substances like PCB, which resist degradation in the environment, bioaccumulate in the bodies of living organisms and are likely to hazardous to the health of human beings in cases of continuous intake, and to regulate production, import and use of chemicals with a view to preventing the environment from being contaminated by such chemical substances. The Chemical Substances Control Law was amended in 2003, to bring within its regulation chemical substances which are likely to cause damages to top predators in the ecosystem.

Moreover, there were several moves to establish PCB disposal facilities under the initiative of the private sector in order to dispose of the PCB already produced. However, such moves failed to ensure understanding and consent from local communities, with the result that

much of the PCB had remained in stockpiling without being disposed of over nearly 30 years. It was also found that during the long term stockpiling some transformers were lost or became untraceable and there were concerns that such stockpiled PCB might contaminate the environment. Thus, in June 2001, the Law concerning Special Measures against PCB Waste (Law No.65 of 2001, hereafter referred to as the PCB Special Measures Law) was enacted to obligate entities etc. possessing PCB wastes to report the status of their stockpiling and to dispose of such waste within a given timeframe in an environmentally sound manner, with a view to facilitating the sure and correct disposal of PCB waste.

The environmental issue related to dioxins (polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and coplanar PCBs) attracted public attention in 1983 when investigations revealed that dioxins were detected in the fly ashes from municipal waste incinerators. Therefore, measures to monitor dioxins in the bottom sediment and aquatic animals and plants in the rivers, lakes, marshes and sea waters as well as the atmosphere was initiated in 1986. Investigations were implemented on the actual status of waste incinerators in 1984 and pulp and paper factories in 1990.

On the basis of the findings from these investigations, guidelines were established and administrative guidance on controlling emissions was conducted.

Furthermore from around 1996 onward civil society became increasingly concerned about environmental contamination caused by releases from waste incinerator facilities. In 1997 dioxins were designated as hazardous air pollutants and measures were introduced to control their emission into the atmosphere in terms of the preventive actions taken to reduce risks of health hazards under the Air Pollution Control Law (Law No.97 of 1968). Furthermore, in July 1999, the Law concerning Special Measures against Dioxins (Law No.105 of 1999, hereafter referred to as the Dioxins Law) was established and the regulatory framework was put in place to implement comprehensive measures such as establishing the tolerable daily intake and environmental quality standards, regulating the release of emission gases and effluent water from a wide range of facilities, introducing enhanced regulation on waste disposal and conducting investigations on the actual status of contamination and taking measures against contaminated soil and other matters. Now these measures are implemented under the Law.

Section 3 Procedures for the development and revision of the national implementation plan

In January 2003, Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants and its Steering Committee were established and these

started their work for developing the NIP.

After the Inter-Ministerial Meeting had developed the draft NIP document in May 2005, the Inter-Ministerial Meeting published the draft NIP document for comments from the general public for 2 weeks. Afterwards, the National Implementation Plan was amended by the Inter-Ministerial Meeting and submitted to the Council of Ministers for Global Environment Conversation for its endorsement on 24 June 2005.

At the Fourth Conference of the Parties, amendments were made to list nine new chemicals, and the modification came into force on August 2010. Hence, with the cooperation of relevant ministries, the revision of the 2005 NIP started in 2011 and the revised NIP was drafted and published in June 2012 by the Inter-Ministerial Meeting for a 30-day public commenting period. After further revisions, the Plan was adopted at the Inter-Ministerial meeting of 7 August 2012.

Chapter 2 The current status of Japan

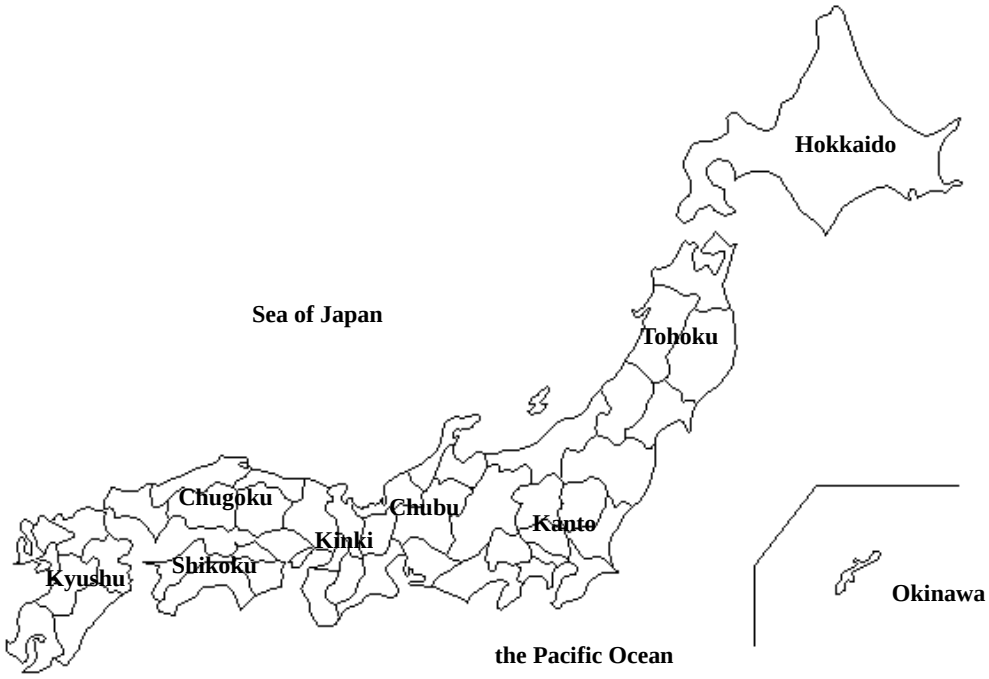
Section 1 Country profile

1. Population and other statistics

(1) Geography

The area of Japan is approximately 378,000 km^2. And it is situated to the east of the Asian Continent. Japan consists of four major islands (Honshu, Hokkaido, Kyushu and Shikoku in the diminishing order of the size of area) and has many other smaller islands. Japan faces the Pacific Ocean on the eastern side, and the Sea of Japan and the East China Sea between Japan and the Asian Continent.

Diagram: Japanese map



(Source: Web-japan homepage [Ministry of Foreign Affairs] http://web-japan.org/factsheet/)

(2) Official language and educational system

Japan's official language is Japanese, and literacy rate is almost 100%. Six years of elementary school and three years of junior high school are compulsory, and 97.5% of students graduating junior high school go to high school and other institutions (as of 2004). 49.9% of students graduating high school go to universities (graduate course) and junior colleges (this figure includes the number of those students attending preparatory schools for university) (as of 2004).

(3) Population dynamics

The total population of Japan is approximately 128 million (as of 2010).

Table: Total population and age composition

Year	Population (unit: 1,000 persons)				Proportion (%)		
	Total number	0～14 years	15～64 years	65 years and over	0～14 years	15～64 years	65 years and over
1920	55,963	20,416	32,605	2,941	36.5	58.3	5.3
1925	59,737	21,924	34,792	3,021	36.7	58.2	5.1
1930	64,450	23,579	37,807	3,064	36.6	58.7	4.8
1935	69,254	25,545	40,484	3,225	36.9	58.5	4.7
1950	84,115	29,786	50,168	4,155	35.4	59.6	4.9
1955	90,077	30,123	55,167	4,786	33.4	61.2	5.3
1960	94,302	28,434	60,469	5,398	30.2	64.1	5.7
1965	99,209	25,529	67,444	6,236	25.7	68.0	6.3
1970	104,665	25,153	72,119	7,393	24.0	68.9	7.1
1975	111,940	27,221	75,807	8,865	24.3	67.7	7.9
1980	117,060	27,507	78,835	10,647	23.5	67.3	9.1
1985	121,049	26,033	82,506	12,468	21.5	68.2	10.3
1990	123,611	22,486	85,904	14,895	18.2	69.5	12.0
1995	125,570	20,014	87,165	18,261	15.9	69.4	14.5
2000	126,926	18,472	86,220	22,005	14.6	67.9	17.3
2005	127,768	17,521	84,092	25,672	13.8	66.1	20.2
2010	128,057	16,803	81,032	29,246	13.2	63.8	23.0

Source: Report on National Census, Statistics Bureau, Ministry of Internal Affairs and Communications
Notes: Persons whose ages are unknown have been included in the total numbers since 1975

(4) Average life expectancy

In 2010, the average life expectancy is 79.6 years for men and 86.4 years for women.

(5) Population of 15 years old or more and unemployment rate

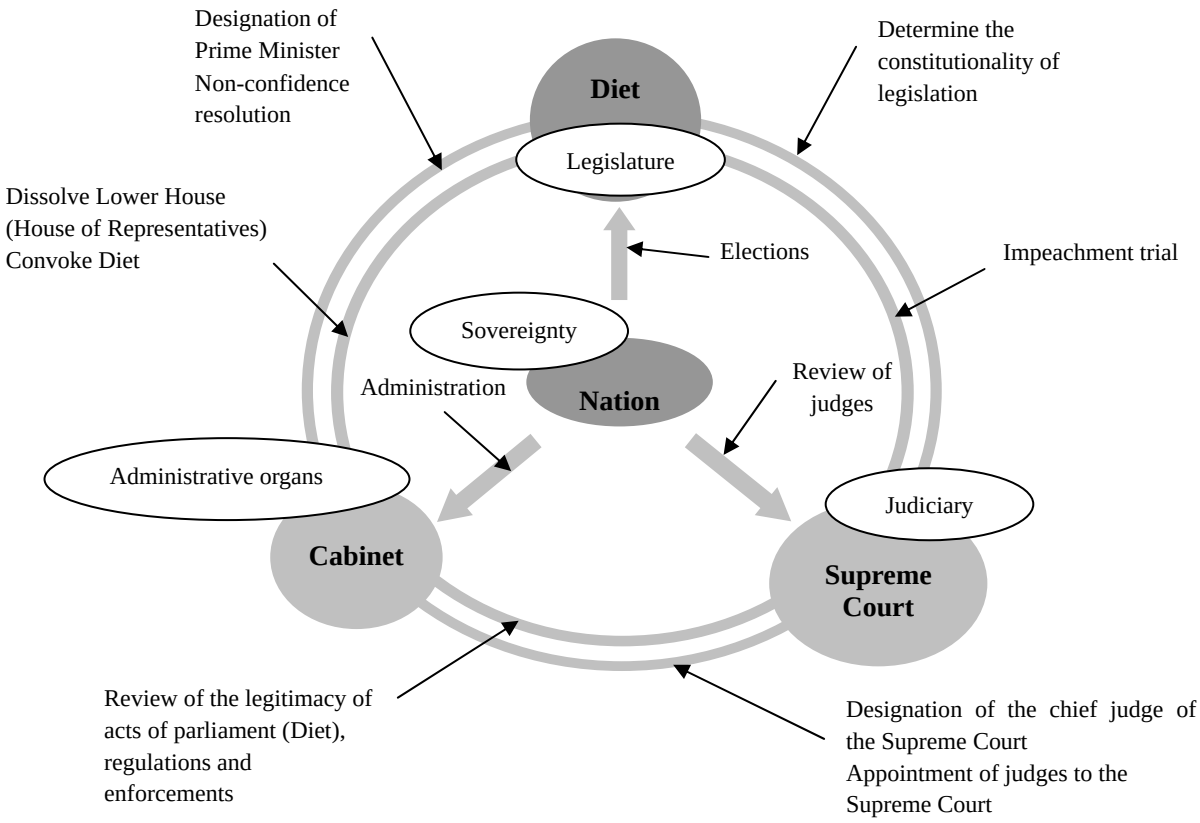
According to the Labour Force Survey in 2010, the population of 15 years old or more is 110.5 million. The unemployment rate is 5.1%.

2. Political structure

(1) Form of government

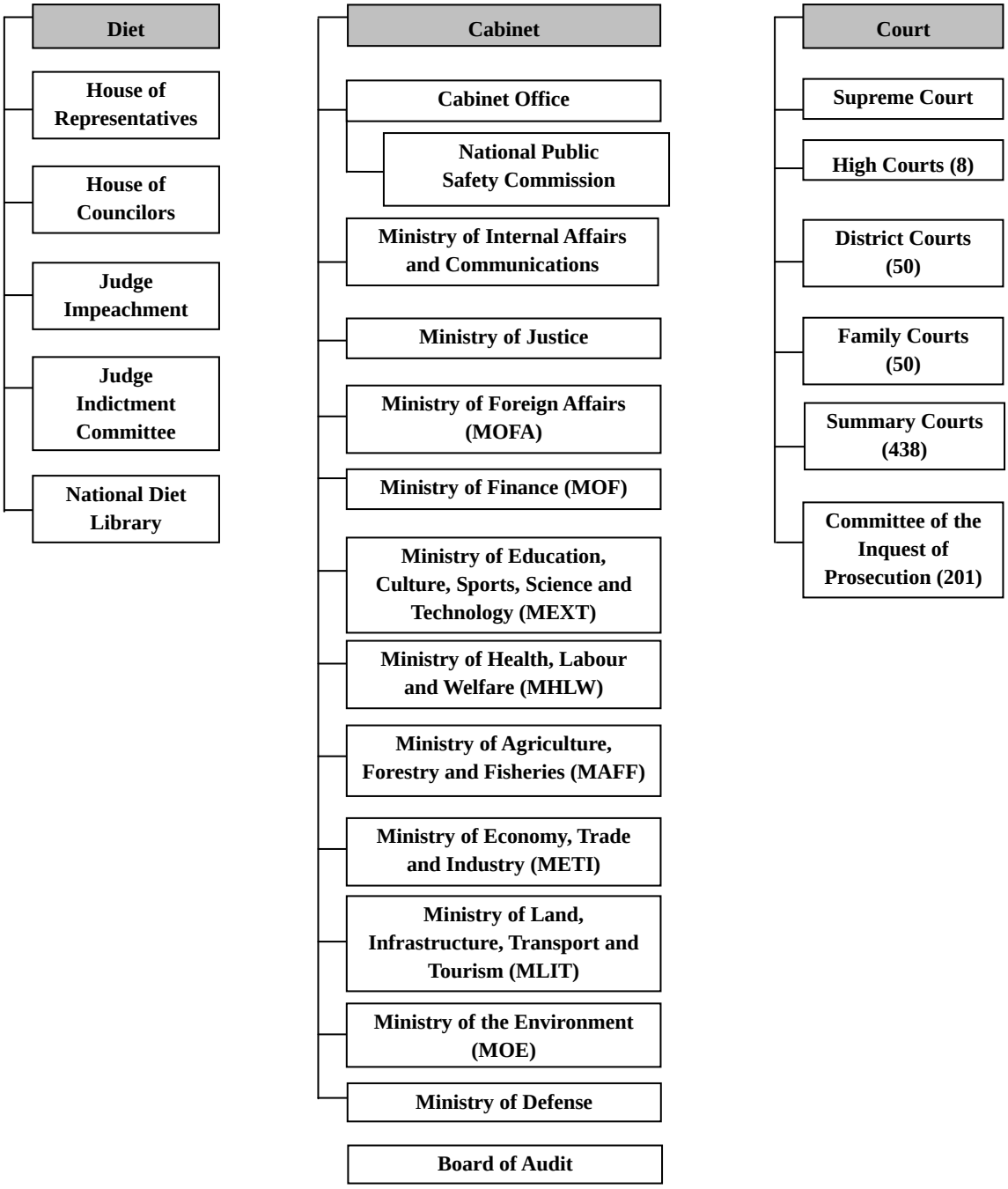
The present Constitution came into effect on 3 May 1947. The Cabinet Law came into effect at the same time, and with it the present cabinet system was established. In others words, under the sovereignty of the nation the separation of the three powers of the Executive, the Legislature and the Judiciary is ensured thoroughly, and at the same time, under the basic framework of a two-house parliamentary cabinet system, the Cabinet was given the status of the main body of executive authority.

Diagram: The separation of the three powers under the Japanese Constitution



The Prime Minister is given the position of Head of the Cabinet and represents the Cabinet. Furthermore, under the Constitution, executive power is vested in the Cabinet. The Cabinet Office and 11 ministries established under the Cabinet exercise administration. Furthermore, committees and agencies are established as external bureau of the Cabinet Office.

Diagram: Structure of the Legislature (Diet), the Executive and the Judiciary



Source: Homepage of the Prime Minister of Japan and his Cabinet
(http://www.kantei.go.jp/foreign/constitution_and_government_of_japan/charts_e.html)

(2) The number of local public authorities

There are 47 prefectures, 786 cities, 753 towns and 184 villages in Japan (as of August 2011). 41 cities have been designated as major urban cities (as of April 2011)

Source: Homepage of the Ministry of Internal Affairs and Communications
(http://www.soumu.go.jp/gapei/index.html, http://www.soumu.go.jp/cyukaku/index.html)

(3) The status of local public authorities and decentralization

The fundamental principle of local autonomy is set in the Local Autonomy Law (Law No. 67 of 1947). This law specifies the formal and organizational framework of local public authorities, and matters regarding their administration. Furthermore, this law stipulates the fundamental relations between the government and local public authorities.

3 The manufacturing and agricultural sectors

(1) Table: Overview of the manufacturing and agricultural sectors

Sector	(1)Contribution rate to Gross Domestic Product (unit: billion yen)(as of 2009)	(2)Number of employees (thousand persons)(as of 2009)
Manufacturing	84,732 (18.0%)	9,827 (15.6%)
Mining	300 (0.1%)	31 (0.05%)
Agriculture, forestry and fisheries	6,659 (1.4%)	388 (0.6%)
Total	91,690 (19.5%)	10,246 (16.3%)

Source: (1) *Annual National Accounts*, Cabinet Office, (2) *2009 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: The definitions of manufacturing and agricultural sectors in each of the statistics vary.

(2) Table: The structure of the manufacturing and agricultural sectors

Sector	Micro Business	Small-Scale Business	Medium-Scale Business	Large-Scale Business
Manufacturing	340,114 (81.4%)	63,650 (15.2%)	10,584 (2.5%)	3,432 (0.8%)
Agriculture, forestry and fisheries	25,794 (90.1%)	2.702 (9.4%)	139 (0.5%)	4 (0.0%)
Total of all sectors	3,746,055 (87.6%)	467,505 (10.9%)	49,877 (1.2%)	12,388 (0.3%)

Source: *2009 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: As of March 13, 2012. Micro businesses are defined here as holding between 1 and 19 employees, small-scale businesses between 20 and 99 employees, medium-scale businesses between 100 and 299 employees, and large-scale businesses more than 300 employees.

4. Employment in the major economic sectors

Table: Employment situation in major types of industry

Type of Industry	Number of Businesses (Establishments)	Number of Employees
Forestry	4,930	61,144
Metal mining	34	447
Coal and lignite mining	15	609
Crude petroleum and natural gas	64	3,690
Food	52,597	1,294,264
Beverages, tobacco and feed	9,095	147,745
Textile mill products	55,133	490,252
Lumber and wood products except furniture	15,637	138,372
Furniture and fixtures	25,827	180,598
Pulp, Paper and paper products	12,951	240,895
Chemicals and related products	10,022	483,669
Petroleum and coal products	1,635	34,081
Plastic products	24,675	442,843
Leather tanning, leather products and fur skins	6,908	46,515
Ceramic, stone and clay products	23,014	324,861
Iron and steel	7,047	233,68
Non-ferrous metals and products	5,465	156,222
Fabricated metal products	68,783	792,889
General purpose machinery	27,069	435,291
Production machinery	41,640	654,864
Business oriented machinery	11,871	295,401
Electrical machinery, equipment and supplies	19,952	585,573
Transportation equipment	21,087	1,051,191
Electricity	1,907	148,753
Gas	604	37,598
Heat supply	230	2,613
Water	6,156	113,363
Waste treatment services	23,045	328,986

Source: *2009 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: As of March 13, 2012

Section 2 Implementation status of measures regarding POPs

1. Regulation of production, use, import and export

Production, use, import and export of the chemicals designated under the Stockholm Convention are prohibited or virtually prohibited under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law, the Pharmaceutical Affairs Law (Law No. 145 of 1960),

the Export Control Ordinance (Ordinance No. 378 of 1949) and the Import Control Ordinance (Ordinance No. 414 of 1949) based on the Foreign Exchange and Foreign Trade Law (Law No. 228 of 1949). These measures will be described for detail in Section 3 of Chapter 3.

2. Measures regarding unintentional production

In Japan under the Dioxins Law, PCDDs, PCDFs and coplanar PCBs are defined as the dioxins. Environmental quality standards, tolerable daily intake (TDI) and emissions standards for effluent water and emission gases from specified facilities are set forth. A government plan to reduce the release of dioxins is established, and various release reduction measures are promoted in a comprehensive manner.

According to the current scientific knowledge, the source categories and the formation processes of PCB and Hexachlorobenzene (HCB) are considered to be similar to those of dioxins. Therefore, it is assumed that the release of PCB and HCB has also been reduced through the dioxins reduction measures.

Under the Law concerning Reporting etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (Law No.86 of 1999, hereafter referred to as the Chemical Substances Release Reporting and Management Promotion Law) dioxins and PCB are subject to the requirements of the PRTR (Pollutants Release and Transfer Register) system.

3. Measures regarding stockpiles and wastes

(1) Collection and detoxification of agricultural chemicals containing POPs

It is prohibited to distribute or use agricultural chemicals containing 14 chemicals listed under the Stockholm Convention or endosulfan as the active ingredient, respectively. Additionally, manufacturers and the like have collected these agricultural chemicals and have either stored them safely or detoxified them.

In Japan, organochlorine agricultural chemicals including certain POPs (aldrin, dieldrin, endrin, DDT and BHC; hereafter referred to as “POPs agricultural chemicals”) used to be stored in the ground. According to a survey done by the Ministry of Agriculture, Forestry and Fisheries, the total amount of stored POPs agricultural chemicals and the number of the stored places identified were 4,400 tons and 168 places, respectively. Approximately 4,000 tons of these POPs agricultural chemicals were already excavated and handled properly by February 2011.

(2) Study for proper disposal of POPs wastes

Stored POPs agricultural chemicals mentioned above and ashes from incineration plants etc. containing dioxins must be disposed of appropriately as wastes containing POPs. Wastes containing dioxins are properly disposed of under the Dioxins Law and the Waste Management and Public Cleansing Law (Law No.137 of 1970, hereafter referred to as the Waste Management Law). Wastes containing PCB are disposed of under the PCB Special Measures Law. In 2009, "Guideline for detoxifying waste electrical machinery etc. contaminated by small amount of PCB – incineration" and "Guideline for collecting and transporting waste electrical machinery etc. contaminated by small amount of PCB (Revised August 2011)" were issued to promote safe and definite detoxification, collection and transport of waste electrical machinery etc. contaminated by small amount of PCB.

To understand the actual wastes emissions and formulate their disposal standards, etc. for other POPs wastes, "Technical Documents on Treatment of Agricultural Chemicals containing POPs" and "Technical Documents on Treatment of Wastes containing PFOS" were formulated based on the outcomes of the above mentioned development of detoxification methods etc. for agricultural chemical wastes containing POPs and wastes containing perfluorooctane sulfonic acid (PFOS) or its salts.

4. Environmental monitoring

In Japan, environmental monitoring on a continuous basis was initiated from 1978 with respect to wildlife and from 1986 with respect to water and bottom sediment with a view to understanding and monitoring long term trends of persistence of chemical substances in the environment. Considering the accumulation and continuity of such data, the measurement has been conducted, in principle, using the same sampling and analytical methods with occasional minor adjustments as necessary. Monitoring of POPs has been newly added in 2002 to the framework of the on-going survey on the actual conditions of chemical substances in the environment. This investigation aims to monitor the quantity of POPs in Japan and verify the effectiveness of the measures for eliminating and reducing their emission.

The nationwide monitoring of dioxins started in 1985 with respect to bottom sediment and aquatic animals in the rivers, lakes, marshes and sea waters and in 1986 with respect to the ambient air. In 1998, water and soil also became subject to nationwide monitoring of dioxins. Furthermore, since 2000, local public authorities have been implementing a larger scale monitoring as a continuous monitoring under the Dioxins Law.

The local public authorities monitor PCB in the rivers, lakes, reservoirs and sea waters as part of the regular-observation for the public water quality under the Water Pollution Control Law

(Law No.138 of 1970).

Section 3 Current situations and problems surrounding POPs

1. Status of general environment

This section outlines the annual trends of concentration of 12 POPs in each environmental medium in Japan and the current situation surrounding POPs. These are based on the results of environmental monitoring conducted up to FY2010. The section also briefly addresses the results of newly listed POPs (HCHs, hexabromobiphenyls polybromodiphenyl ethers, PFOS, pentachlorobenzene, and chlordecone). Inter-annual trends are based on the results of surveys conducted after the introduction of a new high sensitive analytical method in FY2002 which significantly improved the detection limit.（See Reference materials for main past activities in environmental monitoring and current analytical methods used.）

(1) Dioxins

(i) Air

The government started surveys on ambient air in FY1986. Since FY1997, it has conducted annual surveys under the Air Pollution Control Law. Since FY2000, local public authorities have been conducting such surveys on a large scale as the regular observation under the Dioxins Law.

Regarding FY2010 surveys;

- A total of 2,427 specimens from 746 sites across the country were surveyed. The 691 sites, where measurement was conducted more than twice throughout the year, including in summer and in winter, as required for the evaluation against the environmental quality standard for ambient air of an annual average of 0.6 pg-TEQ/m^3 or less, showed an average dioxins concentration of 0.032 pg-TEQ/m^3 with a range of 0.0054 to 0.32 pg-TEQ/m^3. Of these sites, no site exceeded the environmental quality standard for ambient air (excess rate of 0.0%).
- Surveys for the PCDDs/DFs concentration have been continued at 33 sites. The current average PCDDs/DFs concentration at these sites was substantially declining to 0.034 pg-TEQ/m^3, compared with 0.61pg-TEQ/m^3 in FY1997.

(ii) Public waters

The government started surveys on the quality of public waters in FY1998. Since

FY2000, local public authorities have been conducting such surveys on a large scale as regular observation under the Dioxins Law.

Regarding FY2010 surveys;

- A total of 1,610 sites across the country showed average dioxins concentration of 0.19 pg-TEQ/L with a range of 0.010 to 2.1 pg-TEQ/L. Of these sites, 26 sites (25 sites in rivers and one site in a lake) exceeded the environmental quality standard for water of annual average of 1 pg-TEQ/L or less (excess rate of 1.6%).
- Surveys are continued at 784 sites. The current average concentration of dioxins at these sites has been declining to 0.21 pg-TEQ/L, compared with 0.47 pg-TEQ/L in FY2000.

(iii) Bottom sediment in public waters

The government started surveys on bottom sediment in public waters in FY1985. Since FY2000, local public authorities have been conducting such surveys on a large scale as the regular observation under the Dioxins Law.

Regarding FY2010 surveys;

- A total of 1,328 sites across the country showed average dioxins concentration of 6.9 pg-TEQ/g-dry with a range of 0.054 to 320 pg-TEQ/g-dry. Of these sites, six sites (five sites in rivers and one site in a sea) exceeded the environmental quality standard for bottom sediment of 150 pg-TEQ/g or less (excess rate of 0.5%).
- Surveys are continued at 495 sites. The current average concentration of dioxins at these sites has been declining to 9.8 pg-TEQ/g-dry, compared with 17 pg-TEQ/g-dry in FY2000.

(iv) Groundwater

The government started surveys on groundwater in FY1998. Since FY2000, local public authorities have been conducting such surveys on a large scale as the regular observation under the Dioxins Law.

Regarding FY2010 surveys;

- A total of 590 sites across the country showed average dioxins concentration of 0.048 pg-TEQ/L with a range of 0.0098 to 0.44 pg-TEQ/L. All sites met the environmental standard for water of annual average of 1 pg-TEQ/L or less.

(v) Soil

The government started surveys on soil in FY1998. Since FY2000, local public authorities have been conducting such surveys on a large scale as the regular observation under the Dioxins Law.

Regarding FY2010 surveys;

- A total of 998 sites across the country showed average dioxins concentration of 3.0 pg-TEQ/g-dry with a range of 0 to 94 pg-TEQ/g-dry. Of these sites, no site exceeded the environmental quality standard for soil of 1,000 pg-TEQ/g-dry or less (excess rate of 0.0%).
- An average dioxins concentration at 714 sites, targeted in a general environmental survey, was 2.1 pg-TEQ/g-dry with a range of 0.000032 to 61 pg-TEQ/g-dry. An average dioxins concentration at 284 sites, targeted in a survey on areas surrounding sources was 5.4 pg-TEQ/g-dry with a range of 0 to 94 pg-TEQ/g-dry.

(vi) Aquatic life

The government implemented surveys on aquatic life from FY1985 to FY1999.

Regarding FY1999 surveys;

- A total of 2,832 specimens of fish, crustaceans and shellfish from 543 sites showed average dioxins concentration of 1.4 pg-TEQ/g-wet with a range of 0.032 to 33 pg-TEQ/g-wet. The average concentration was slightly lower and the range remained at almost same level, compared with the FY1998 figures (average of 2.1pg-TEQ/g-wet and a range of 0.0022 to 30 pg-TEQ/g-wet).

(vii) Wild mammals/birds

The government implemented surveys on wildlife from FY1997 to FY2007.

Regarding FY2007 surveys;

- A total of 41 specimens of birds, marine mammals and land mammals were examined. Accumulated concentrations remained at the same level compared with the past surveys. Although the average concentration was higher than the past results, no clear trend was observed.
- The surveys insisted that although the amount of environmentally released dioxins has decreased from measures taken at the emission source, its effect is limited or will take time for the accumulated concentration in wildlife.

(viii) Human

The government started surveys on human in FY2002.

Regarding FY2010 surveys;

- The average dioxins concentration in blood for 174 people was 14 pg-TEQ/g-fat with a range of 0.10 to 82 pg-TEQ/g-fat, both within the range of the past surveys.
- The average dioxins concentration in blood for 2,264 people covered in the past nine

years is 19 pg-TEQ/fat with a range of 0.10 to 130 pg-TEQ/fat. Blood dioxin concentration differed significantly by area, age, breast-feeding or childbirth experience, and occupation.

(2) Polychlorinated biphenyls（PCBs）

The government has been continuously monitoring PCBs in wildlife (bivalves, fish and birds) from FY1978 to FY2001. As for air, water and sediments, a highly sensitive analytical method was introduced in FY2001, and a descriptive analysis was done for conjugates and coplanar PCBs. Using this method, the government has been monitoring the concentration levels in wildlife (bivalves, fish and birds), air, water and sediments annually with its monitoring survey since FY2002.

(i) Wildlife

- Especially in Tokyo Bay, Osaka Bay and Offshore of Himeji, which are semi-closed water areas and located close to densely populated districts, the PCB concentration in sea bass is relatively high, compared with specimens in other areas. The figure seems to be fluctuating in Tokyo Bay and Osaka Bay between tens and hundreds of ng/g-wet. Thus it is difficult to identify a clear trend. The PCB concentration in dace in Lake Biwa has remained stable at tens of ng/g-wet (See reference materials Figure 1).
- For bivalves, the PCB concentration in blue mussel and purplish bifurcate mussel in Dokai Bay has been decreasing. The concentrations in hard-shelled mussel in Naruto and blue mussel in Yamada Bay and coast of Noto Peninsula have stayed stable below 10 ng/g-wet. (See reference materials Figure 2).
- Regarding the FY2010 surveys, PCBs were detected from all sites for bivalves, fish and birds (detection limit: 20pg/g-wet). The range of total concentration was 1,500 to 46,000 pg/g-wet, 880 to 260,000 pg/g-wet, 6,600 to 9,100 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- No significant trend was observed through FY2002 to FY2010.
- Regarding the FY2010 surveys, PCBs were detected from all sites within the range of 36 to 970 pg/m^3 and 19 to 630 pg/m^3 by total concentration for warm season and cold season, respectively.

(iii) Water

- Statistically significant decrease of PCB concentration in rivers, lakes and estuaries was observed through FY2002 to FY2010. Reduction tendency in specimens from overall areas was also identified as statistically significant.
- The total PCB concentration in water varies widely from undetected to 2,200 pg/L

(detection limit: 24 pg/L). Regarding FY2010 surveys, the PCB concentration exceeded 1,000 pg/L at a number of ports and estuaries near large cities such as those along Tokyo Bay and Osaka Bay (See reference materials Table 6).

(iv) Sediment

- No significant trend was observed through FY2002 to FY2010.
- The total PCB concentration in bottom sediment also varies widely from undetected to 710,000 pg/g-dry (detection limit: 220pg/g-dry). The PCB level is especially high in Osaka Port. In Keihin Canal (Port of Kawasaki), Dokai Bay and mouth of River Sumida, PCBs were detected over one hundred thousands pg/g-dry (See reference materials Table 7).

The environmental quality standard for water and soil requires that PCBs should not be detected by the gas chromatography method at the quantification limit of 0.0005 mg/L. The FY2010 survey on public waters and groundwater ascertained that all measuring sites meet the standard.

(3) Hexachlorobenzene（HCB）

The government has monitored the HCB concentration in organisms from 1978 to 2001, excluding 1997 and 1999. The HCB concentration in air was first measured in 1999 in the Survey on Development of an Analytic Method for Chemicals and then in the Environmental Survey on Endocrine Disruptors. As for HCB concentration in water and sediment, the government has done monitoring surveys from 1986 to 1998 and 2001, respectively. A high sensitive analytical method was introduced in FY2002, and the HCB concentration levels in wildlife (bivalves, fish and birds), air, water and sediment are monitored annually.

(i) Wildlife

- No significant trend was observed through FY2002 to FY2010.
- HCB has been detected from all sites since FY2002. Regarding FY2010 surveys, HCB was detected at concentration ranges of 4 to 210 pg/g-wet, 36 to 1,700 pg/g-wet and 500 to 1,900 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- No significant trend was observed through FY2002 to FY2010.
- HCB has been detected from all sites since FY2002. Regarding FY2010 surveys, concentration in air ranged from 73 to 160 pg/m^3 (warm season) and 56 to 380 pg/m^3 (cold season).

(iii) Water

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in rivers and

estuaries. Reduction tendency in specimens from overall areas was also identified as statistically significant. Regarding FY2010 surveys, concentration in water ranged from undetected to 120 pg/L with the detection limit of 4 pg/L.

(iv) Sediments

- No significant trend was observed through FY2002 to FY2010.
- Regarding FY2010 surveys, HCB was detected from all sites with a concentration range of 4 to 21,000pg/g-dry.

(4) Aldrin, dieldrin and endrin

The government had monitored drins in biological specimens annually from FY1978 to FY1989, and then on FY1991 and FY1993. Annual surveys using high sensitive method was conducted from FY2002 to FY2009 on wildlife (bivalves, fish and birds), air, water and sediment.

Although drins were once used within the country, the environmental concentrations stayed constant over the years. Thus, with the addition of chemicals to the Stockholm Convention list, the frequencies of governmental surveys were reviewed and drins were decided to be monitored at two to three year intervals from FY2011.

Since no survey was conducted for FY2010, the results of the FY2009 survey are summarized below.

(i) Wildlife

- Statistical analysis from FY2002 to FY2009 indicated a decreasing trend of dieldrin concentration in black-tailed gulls and gray starlings. The decrease in concentration of endrin in black-tailed gulls was also recognized as statistically significant.
- Dieldrin has been detected from all sites since the FY2002 survey. Regarding FY2009 survey, dieldrin was detected at concentration ranges of 48 to 28,000 pg/g-wet, 29 to 1,400 pg/g-wet, and 330 to 890 pg/g-wet for bivalves, fish and birds respectively.
- Regarding the FY2009 survey, endrin was detected at concentration ranges of 5 to 1,400 pg/g-wet, undetected to 270 pg/g-wet, and 3 to 43 pg/g-wet for bivalves, fish and birds respectively (detection limit 3pg/g-wet).
- Compared to dieldrin and endrin, aldrin was less frequently detected. Regarding FY2009 survey, aldrin was detected only from bivalves and fish at concentration ranges of undetected to 89 pg/g-wet and undetected to 3.1 pg/g-wet respectively at detection limit of 0.8pg/g-wet.

(ii) Air

- No significant trend was observed through FY2002 to FY2009 for aldrin, dieldrin or endrin.
- Regarding FY2009 survey, dieldrin and endrin was detected from almost all sites for

both warm and cold seasons.

- The concentration of dieldrin ranged from 0.91 to 150 pg/m^3 and 0.52 to 80 pg/m^3 for warm and cold season, respectively. The concentration of endrin ranged from undetected to 3.4 pg/m^3 and undetected to 1.8 pg/m^3 for warm and cold season, respectively (detection limit 0.04 pg/m^3).
- Compared to dieldrin and endrin, aldrin was less frequently detected. Aldrin was detected at concentration ranges of undetected to 10 pg/m^3 and undetected to 1.8 pg/m^3 for warm and cold season, respectively (detection limit 0.02 pg/m^3).

(iii) Water

- Statistical analysis from FY2002 to FY2009 indicated a decreasing trend in concentration of endrin in overall areas. No significant trend was observed through FY2002 to FY2009 for aldrin and endrin.
- Regarding FY2009 survey, aldrin, dieldrin and endrin were detected from almost all sites at concentration levels of undetected to 22 pg/L, 2.7 to 650 pg/L and undetected to 67 pg/L, respectively (detection limits 0.3 pg/L (aldrin), 0.3 pg/L (endrin)).

(iv) Sediment

- Statistical analysis from FY2002 to FY2009 indicated a decreasing trend in concentration of aldrin in sea area and endrin in overall areas. No significant trend was observed through FY2002 to FY2009 for endrin.
- Regarding FY2009 survey, aldrin, dieldrin and endrin were detected from almost all sites at concentration levels of undetected to 540 pg/g-dry, 1.1 to 3000 pg/g-dry and undetected to 11,000 pg/g-dry, respectively (detection limits 0.2pg/g-dry (aldrin), 0.6pg/g-dry (endrin)).

(5) DDTs

The government started the measurement of DDTs (six DDTs, including p,p'-DDT, o,p'-DDT, p,p'-DDE, o,p'-DDE, p,p'-DDD and o,p'-DDD) on biological specimens in 1978. Water and bottom sediment specimens were monitored for three p,p'-DDTs from 1986 to 1998 and 2001, respectively. In 2002, a high-sensitivity analytical method was adopted and monitoring has continued for six DDTs in all specimens.

(i) Wildlife

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in concentrations of five DDTs (excluding p,p'-DDE) in bivalves. The decrease in concentration of four DDTs (excluding p,p'-DDT and o,p'-DDT) in fish specimens were also recognized as statistically significant.
- Regarding FY2010 surveys, all of the six DDTs were detected from all sites for bivalves

and fish. The total concentration was within the range of 460 to 7,400 pg/g-wet, 360 to 19,000 pg/g-wet and 6,400 to 160,000 pg/g-wet for bivalves, fish and birds, respectively (detection limit 4.3 pg/g-wet).

- Of the six DDTs, the metabolite p,p'-DDE tend to dominate in wildlife specimens (See reference materials Figure 4). As for fish specimens, higher p,p'-DDE concentration was observed in sea bass from Tokyo Bay (See reference materials Figure 5).

(ii) Air

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in concentrations of four DDTs (excluding p,p'-DDT and p,p'-DDD) in warm season. As for cold season, the decrease in concentration of two DDTs (o,p'-DDT and o,p'-DDE) were also recognized as statistically significant. No significant trend was observed for p,p'-DDTs in both warm and cold seasons.
- Regarding FY2010 surveys, all six DDTs were detected from all sites in both warm and cold seasons, with total concentration ranges of 1.0 to 290 pg/m^3 and 1.4 to 41 pg/m^3 respectively.

(iii) Water

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in the concentrations of p,p'-DDT in lakes, p,p'-DDE in rivers and estuaries, o,p'-DDD in estuaries, and o,p'-DDT in overall areas. No significant trends were observed for o,p'-DDE or p,p'-DDD.
- Regarding FY2010 surveys, all of the six DDTs were detected from almost all sites. The total concentration was in the range of 8.0 to 11,000 pg/L.

(iv) Sediment

- No significant trend was observed through FY2002 to FY2010 for any of the six DDTs.
- Regarding FY2010 surveys, all six DDTs were detected from all sites at a wide range of 42 to 330,000 pg/g-dry by total concentration.

(6) Chlordanes

Chlordanes (cis-chlordane, trans-chlordane, cis-nonachlor, trans-nonachlor, oxychlordane) were monitored in wildlife (bivalves, fish and birds) from FY1983 to FY2001. As for water and sediment specimens, monitoring surveys were done from FY1986 to FY1998 and FY1986 to FY2001, respectively, for five isomers excluding oxychlordane.

Since FY2002 the government has been conducting annual monitoring surveys for wildlife (bivalves, fish and birds), air, water and sediment.

(i) Wildlife

- Regarding fish, a high chlordane concentration has been detected in sea bass in Tokyo

Bay and Osaka Bay and Dace in River Azumi of Lake Biwa (See reference materials Table 8). However, the trans- and cis-chlordane and oxychlordane concentrations are on the decline (See reference materials Figure 6). Since FY2002, chlordane has been found in all fish specimens.

- For bivalves, statistical analysis from FY2002 to FY2010 indicated a decreasing trend in concentrations of cis-chlordane, trans-nonachlor and oxychlordane. No significant trend was observed for cis-nonachlor.
- Chlordanes have been detected from bird specimens as well. Regarding FY2010 surveys, chlordanes were detected from all sites of wildlife specimens. The total concentrations ranged from 230 to 31,000 pg/g-wet, 230 to 11,000 pg/g-wet and 860 to 1,600 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- Since FY2002, chlordanes are detected from all sites. Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in concentrations of all five chlordanes in warm season. Regarding FY2010 surveys, total concentration ranged from 6.6 to 2,100 pg/m^3 and 2.9 to 380 pg/m^3 for warm and cold season, respectively.

(iii) Water

- Since FY2002, chlordanes are detected from almost all sites. Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in concentrations of cis-chlordane, trans-chlordane and trans-nonachlor in overall areas. No significant trends were identified for oxychlordane or cis-nonachlor.
- Regarding FY2010 surveys, chlordanes were detected at range of undetected to 540 pg/L by total concentration (detection limit 12 pg/L).

(iv) Sediment

- The chlordane concentration in bottom sediment tends to be relatively high near large cities (See reference materials Table 9). Statistical analysis from FY2002 to FY2010 indicated a decreasing trend in the concentrations of trans-chlordane, cis-nonachlor and trans-nonachlor in sea areas. The decreasing trend in concentration of cis-chlordanes in specimens from overall areas was also identified as statistically significant. No significant trend was observed for oxychlordane.
- Regarding FY2010 surveys, chlordanes were detected at total concentrations of 14 to 25,000 pg/g-dry.

(7) Heptachlors

The government started the measurement of heptachlor for water, bottom sediment and organisms in 1982. It started the measurement of air in 1986. The heptachlor epoxide concentration

was measured in 1982 and 1996 for water, bottom sediment and biological specimens, and in 1986 for air. Annual monitoring surveys using high-sensitivity analytical method has started from FY2002 for heptachlor and FY2003 for cis-heptachlor epoxide and trans-heptachlor epoxide on wildlife (bivalves, fish and birds), air, water and sediment.

(i) Wildlife

- No significant trend was observed through FY2002 to FY2010.
- Regarding FY2010 surveys, cis-heptachlor epoxide was detected from all sites. Heptachlor was detected from bivalves, fish and birds (detection limit 1 pg/g-wet). trans-heptachlor epoxide was only detected in bivalves (detection limit 1pg/g-wet). The total concentration was within the range of 10 to 1,900 pg/g-wet, 6.0 to 230 pg/g-wet and 240 to 360 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- No significant trend was observed through FY2002 to FY2010.
- Regarding FY2010 surveys, heptachlor and cis-heptachlor epoxide were detected from all sites in both warm and cold season. trans-heptachlor epoxide was only detected in the warm season (detection limit 0.06 pg/m^3). Heptachlors were detected at total concentration ranges of 1.4 to 170 pg/m^3 and 0.73 to 53 pg/m^3 for warm and cold season, respectively.

(iii) Water

- Statistical analysis from FY2003 to FY2010 indicated a decreasing trend in the concentrations of cis-heptachlor epoxide in estuaries and sea areas. Regarding FY2010 surveys, the total concentration was in the range of undetected to 760 pg/L (detection limit 1.4 pg/L).

(iv) Sediment

- Statistical analysis from FY2003 to FY2010 indicated a decreasing trend in the concentrations of cis-heptachlor epoxide in estuaries.
- Regarding FY2010 surveys, heptachlor and cis-heptachlor epoxide were detected from almost all sites while trans-heptachlor epoxide was only detected from a single site. The total concentration of chlordanes was within the range of undetected to 340 pg/g-dry (detection limit 1.7 pg/g-dry).

(8) Toxaphenes

The government started the measurement of toxaphene in water and bottom sediment in 1983. No toxaphene concentration was detected above the minimum detectable level of 0.3 to 0.6 μg/L for water and 0.01 to 0.04 pg/g-dry for bottom sediment. A high-sensitive analytical method was introduced in FY2003, and Parlar-26, Parlar-50, and Parlar-62 were monitored annually as

toxaphenes. With the addition of chemicals to the Stockholm Convention list, the frequency of governmental surveys was reviewed, and toxaphenes were decided to be monitored at two to three year intervals from FY2011 since toxaphenes were never used in the country.

Since no survey was conducted for FY2010, the results up to FY2009 are summarized below.

(i) Wildlife

- Statistical analysis from FY2003 to FY2009 indicated a decreasing trend of all three toxaphenes in black-tailed gulls.
- Regarding FY2009 surveys, Parlar-50 had the highest concentration in the range of undetected to 31 pg/g-wet, undetected to 910pg/g-wet and undetected to 620pg/g-wet for bivalves, fish and birds, respectively (detection limit 3 pg/g-wet). Parlar-26 was detected in the concentration range of undetected to 23 pg/g-wet, undetected to 690 pg/g-wet and undetected to 500 pg/g-wet for bivalves, fish and birds (detection limit 3 pg/g-wet). Parlar-62 was only detected from fish and birds, and their concentrations were undetected to 660 pg/g-wet and undetected to 210 pg/g-wet, respectively (detection limit 20 pg/g-wet).

(ii) Air

- Regarding FY2009 surveys, Parlar-26 was detected from all sites in both warm and cold seasons at concentrations of 0.11 to 0.26 pg/m^3 and undetected to 0.27 pg/m^3 respectively (detection limit 0.09 pg/m^3). Parlar-50 was detected at concentration range of undetected to 0.1 pg/m^3 for both warm and cold season, and only from a single site in the cold season (detection limit 0.1 pg/m^3). Parlar-62 was not detected from any of the sites (detection limit 0.6 pg/m^3).

(iii) Water

- None of the three toxaphenes were detected at any sites from FY2003 to FY2009. The detection limits for FY2009 survey were 2 pg/L, 3 pg/L and 20 pg/L for Parlar-26, Parlar-50 and Parlar-62, respectively.

(iv) Sediment

- None of the three toxaphenes were detected at any sites from FY2003 to FY2009. The detection limits for FY2009 survey were 4 pg/g-dry, 5 pg/g-dry and 30 pg/g-dry for Parlar-26, Parlar-50 and Parlar-62, respectively.

(9) Mirex

The government surveyed the concentration of mirex in water and bottom sediment in 1983 and no mirex concentration was detected above the minimum detectable level of 0.01μg/L for water and 0.0006 to 0.0024 μg/g-dry for bottom sediment. A high-sensitive analytical method was

introduced in FY2003 and annual monitoring was conducted on wildlife (bivalves, fish and birds), air, water and sediment. With the addition of chemicals to the Stockholm Convention list, the frequency of governmental surveys was reviewed, and mirex was decided to be monitored at two to three year intervals from FY2011, since mirex was never used in Japan.

Since no survey was conducted for FY2010, the results up to FY2009 are summarized below.

(i) Wildlife

- Statistical analysis from FY2003 to FY2009 indicated a decreasing trend in black-tailed gulls and gray starlings.
- Regarding FY2009 surveys, mirex was detected from all sites at concentration range of 1.7 to 21 pg/g-wet, 0.9 to 37 pg/g-wet and 32 to 79 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- No significant trend was observed through FY2003 to FY2009.
- Regarding FY2009 surveys, mirex was detected from all sites at concentration range of 0.049 to 0.48 pg/m^3 and 0.030 to 0.18 pg/m^3 for warm and cold season, respectively.

(iii) Water

- Regarding FY2009 surveys, mirex was detected from all sites at concentration range of undetected to 0.5 pg/L at detection limit of 0.2 pg/L.

(iv) Sediment

- No significant trend was observed through FY2003 to FY2009.
- Regarding FY2009 survey, mirex was detected at concentration ranging from undetected to 620 pg/g-dry at detection limit of 0.4 pg/g-dry.

(10) HCHs

Monitoring of HCHs was done on biological specimens from 1978 to 2001 (excluding FY1997, 1998) with the main focus on α- and β-HCH. Water and sediment specimens were also monitored from FY1986 to FY1998 and FY2001, respectively. Annual monitoring of water, sediment and wildlife (bivalves, fish and birds) have been conducted on α- and β-HCH from FY2002, and γ- and δ-HCH from FY2003. Air specimens have also been monitored for all four isomers from FY2009.

(i) Wildlife

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend of γ-HCH in bivalves and fish. No significant trends were observed for α- , β- and δ-HCH.
- Regarding FY2010 surveys, α- , β- and γ-HCH were detected from all sites. The concentration of α-, β-, γ- and δ-HCH in bivalves were 13 to 730 pg/g-wet, 27 to 1,500

pg/g-wet, 5 to 150 pg/g-wet and undetected to 870 pg/g-wet, respectively. The concentration of α-, β-, γ- and δ-HCH in fish were 1 to 250 pg/g-wet, 5 to 760 pg/g-wet, 1 to 56 pg/g-wet and undetected to 36 pg/g-wet, respectively. The concentration of α-, β-, γ- and δ-HCH in birds were 160 to 430 pg/g-wet, 910 to 2,800 pg/g-wet, 4 to 23 pg/g-wet and 11 to13 pg/g-wet, respectively (detection limit of δ-HCH 1pg/g-wet).

(ii) Air

- Regarding FY2010 surveys, all four isomers were detected from all sites. The concentrations of α-, β-, γ- and δ-HCH in warm season were 14 to 280 pg/m^3, 0.89 to 34 pg/m^3, 2.3 to 66 pg/m^3 and 0.11 to 25 pg/m^3 respectively. The concentrations of α-, β-, γ- and δ-HCH in cold season were 6.8 to 410 pg/m^3, 0.26 to 29 pg/m^3, 1.1 to 60 pg/m^3 and 0.05 to 22 pg/m^3, respectively.

(iii) Water

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend of β-HCH in lakes and γ-HCH in rivers, estuaries, sea areas and overall areas. No significant trend was observed for α-HCH. No significant trend was observed for δ-HCH in overall areas.
- Regarding FY2010 surveys, all four isomers were detected from all sites. The concentrations of α-, β-, γ- and δ-HCH were 14 to 1,400 pg/L, 33 to 2,500 pg/L, 5 to 190 pg/L and 0.9 to 780 pg/L, respectively.

(iv) Sediment

- Statistical analysis from FY2002 to FY2010 indicated a decreasing trend of β- and γ-HCH in lakes. No significant trends were observed for α- and δ-HCH.
- Regarding FY2010 surveys, all four isomers were detected from all sites. The concentrations of α-, β-, γ- and δ-HCH were 3.1 to 3,700 pg/g-dry, 11 to 8,200 pg/g-dry , 1.5 to 2,300 pg/g-dry and 1.3 to 3,800 pg/g-dry, respectively.

(11) Hexabromobiphenyls

The government has been monitoring hexabromobiphenyls since FY2009. Regarding FY2010 surveys, hexabromobiphenyls were only detected in sediment specimens at a range of undetected to 18 pg/g-dry with the detection limit of 0.6 pg/g-dry. They were not detected from wildlife (bivalves, fish and birds), air or water with the detection limits of 10 pg/g-wet, 0.1 pg/gm^3 and 1 pg/L, respectively.

(12) Polybromodiphenyl ethers

The government has been monitoring polybromodiphenyl ethers (limited to congeners with four or more bromines) since FY2009. Regarding FY2010 surveys, the concentration of total polybromodiphenyl ethers detected from wildlife ranged from undetected to 610 pg/g-wet,

undetected to 1,200 pg/g-wet and 460 to 660 pg/g-wet for bivalves, fish and birds, respectively (detection limit 150 pg/g-wet). The total concentration ranged from undetected to 330pg/m^3, undetected to 120pg/m^3, undetected to 14,000pg/L, undetected to 730,000pg/g-dry for air (warm season), air (cold season), water and sediment, respectively. The detection limits were 11pg/m^3, 110pg/L and 100pg/g-dry for air, water and sediment, respectively.

(13) PFOS

The government has been monitoring PFOS since FY2009. Regarding FY2010 surveys, n-perfluorooctane sulfonic acids with linear octyl chain were analyzed and detected from wildlife (bivalves, fish and birds), air, water and sediments from the majority of the sites. PFOS were detected at concentration range of undetected to 680 pg/g-wet (bivalves), undetected to 15,000 pg/g-wet (fish), 580 to 3,000 pg/g-wet (birds) for wildlife (detection limit: 9.6pg/g-wet). The concentration ranged from 1.6 to 14 pg/m^3, 1.4 to 15 pg/m^3, 37 to 230,000 pg/L and 3 to 1,700 pg/g-dry for air (warm season), air (cold season), water and sediment, respectively.

(14) Pentachlorobenzene

The government conducted surveys for wildlife (bivalves, fish and birds), air, water and sediment in FY2007 and solely for air in FY2009. Continuous monitoring was initiated from FY2010. Regarding FY2010 surveys, pentachlorobenzene was detected from all sites for wildlife, air, water, and sediment. The concentration detected from biological specimens ranged from 5.9 to 110 pg/g-wet, 5.6 to 230 pg/g-wet and 49 to 170 pg/g-wet for bivalves, fish and birds, respectively. The concentration ranged from 36 to 140 pg/m^3, 37 to 180 pg/m^3, 1 to 100 pg/L and 1.0 to 4,200 pg/g-dry for air (warm season), air (cold season), water and sediment, respectively.

(15) Chlordecone

The government conducted surveys for air in FY2003 and for wildlife (bivalves, fish, and birds), water and sediment in FY2008. In FY2010, the government conducted surveys for wildlife (bivalves, fish and birds), air, water and sediment. Regarding FY2010 surveys, chlordecone was not detected from any sites for wildlife and air (detection limit: wildlife 2.3 pg/g-wet, air 0.02 pg/m^3). The concentration in water and sediment ranged from undetected to 1.6 pg/L and undetected to 2.8 pg/g-dry, respectively (detection limit: water 0.04 pg/L, sediment 0.2 pg/g-dry).

(16) Summary

The general environmental situation of Japan can be summarized as follows with respect to the chemicals discussed above;

(i) Among chemicals subject to environmental quality standards, these standards were met for

dioxins and PCBs at most and all sites surveyed, respectively.

(ii) With regard to chemicals other than dioxins that have been continuously monitored using a high-sensitive analytical method since FY2002, the average concentration or the detection rate have remained almost constant. Nonetheless, these indicators have been decreasing for most POPs during the last 20 years.

(iii) Higher concentrations were observed in water and sediment samples from areas readily affected by human activities such as harbors and semi-closed sea area aside coasts of large cities.

(iv) For wildlife specimens, high concentrations of PCBs and DDTs etc. were observed in fishes caught from coastal areas with densely populated cities.

(v) For all chemicals, the concentration in air was higher in the warm season than the cold.

2. Effectiveness evaluation of measures taken and remaining problems

(1) Dioxins

With respect to dioxins, the guidelines for waste incinerators were established in 1990. In 1992, guidance was provided to pulp and paper factories on emission control measures. Measures against dioxins were strengthened as emission control was imposed in 1997 on waste incinerators and electric steel-making furnaces under Air Pollution Control Law. Further, comprehensive measures are implemented in accordance with the Dioxins Law established in 1999. The Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan (the second Reduction Plan), which was established in June 2005 under the Dioxins Law, set a target of achieving approximately 15% reduction in dioxins emissions at the end of 2010 from the 2003 estimate. Dioxins emissions in 2010 totaled 158 to 160 g-TEQ, an approximately 59% reduction from the 2003 level. This exceeds the reduction target. This is tantamount to an approximately 98% reduction from the 1997 level, the first year of enforcement of the law. The status of environmental pollution has greatly improved due to the significant reduction of dioxins emissions. In recent years, achievement rates stood at close to 100% vis-a-vis environmental standards for each survey medium. In light of these achievements, the reduction plan was revised in August 2012 to prepare the third version, based on the principle that the improved environment would not be exacerbated. Release reduction measures will continue to be implemented precisely in the future.

(2) Polychlorinated biphenyl（PCB）

PCB is designated as Class I Specified Chemical Substance under the Chemical Substances Control Law and thus their manufacture, import and use are virtually prohibited. Since 2001, efforts have been made to properly dispose of PCB wastes in accordance with the PCB

Special Measures Law. As for PCB wastes, they have various properties and exist in various forms, and therefore, it is required to make continuous efforts to consider effective and appropriate disposal measures.

As for PCB unintentionally produced, it was found that PCB was included as residues in certain types of organic pigments that have a wide range of domestic uses, urgent and provisional measures were put into place. They stipulate the prohibition of manufacture, import and use of organic pigments containing PCB above 50 ppm and their collection. Efforts are also underway to consider the necessity of establishing reduction levels of residual PCB unintentionally produced in organic pigments and additional measures that could be achieved economically with industrial technologies. Furthermore, as the sources and categories of emission and formation processes for the other PCBs are similar to those of dioxins, the measures currently taken for dioxins are basically expected to help reduce PCB concentrations as well.

(3) Hexachlorobenzene（HCB）

As a Class I Specified Chemical Substance, the manufacture, import and use of hexachlorobenzene are virtually prohibited under the Chemical Substances Control Law. Meanwhile, the source categories of emission and formation processes for HCB produced unintentionally are similar to those for dioxins. Therefore, the measures currently taken for dioxins are expected to help reduce HCB concentrations as well. Nevertheless, HCB are still detected in the environment. Therefore, it is required to monitor the concentrations constantly as well as to promote measures to reduce HCB emissions.

(4) Aldrin, dieldrin, endrin and heptachlor

The manufacture, use and other activities regarding aldrin, dieldrin, endrin and heptachlor have been regulated since the 1970s-1980s under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Decreasing trends in concentrations of aldrin, dieldrin, endrin and heptachlor in some environmental media have been observed, although they are still detected in the environment. Crops such as cucumber are particularly prone to absorb drin agricultural chemicals when planted in the field where they were used before, and therefore it is possible that these chemicals are found in the crops over the Maximum Residue Limit. Government has provided guidance on change of crops, and conducted research and development for technology that enables reduction of absorption of drin agricultural chemicals and heptachlor in soils by crops.

(5) DDT

The manufacture, use and other activities regarding DDTs have been regulated since the

1970s-1980s under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Although DDTs are still detected in the environment, decreasing trends in concentrations in some environmental media have been observed.

(6) Chlordanes

The manufacture, use and other activities regarding chlordanes have been regulated since the 1960s-1980s under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Although chlordanes are still detected in the environment, decreasing trends in concentrations in some environmental media have been observed. Japan's issue in the future is to establish a disposal method for chlordane currently in storage and fully implement the chlordane disposal system.

(7) Toxaphene and mirex

There is no record of manufacture, import or use of toxaphene and mirex in Japan. A high-sensitivity analytical method was introduced in FY 2003. Since the 2003 survey, mirex has been found in almost all specimens, although at a low level. Toxaphene was not detected in water or bottom sediment. Instead, it was found in some organisms. A low toxaphene concentration was also detected in the air. These two chemicals are designated as Class I Specified Chemical Substance under the Chemical Substances Control Law and are designated as agricultural chemicals of which the distribution and use is prohibited under the Agricultural Chemicals Regulation Law. Therefore, under these laws, necessary measures to control these chemicals have been already implemented.

(8) Lindane

HCHs were used as agricultural chemicals and also as insecticides for termite control. While the registration expired in 1971 under the Agricultural Chemicals Regulation Law, they were still used as insecticides for termite control and wood treatment agents. As for α-HCH、β-HCH and γ-HCH (alias: Lindane), they were designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law and their manufacture, import and use are virtually prohibited. Also, as for lindane related to agricultural use, its use and other activities have been already regulated since the 1970s under the Agricultural Chemicals Regulation Law.

(9) Hexabromobiphenyls

Hexabromobiphenyls were used as fire retardants for plastic products. It was designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited.

(10) Polybrominated diphenyl ethers

Polybrominated diphenyl ethers were used as fire retardants for plastic products. As for tetrabrominated diphenyl ethers, pentabrominated diphenyl ethers, hexabrominated diphenyl ethers, heptabrominated diphenyl ethers with bromine number of 4 to 7 respectively, they were designated in April 2010 as Class I Specified Chemical Substance under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited.

(11) PFOS or its salts, perfluorooctane sulfonyl fluoride (PFOSF)

PFOS or its salts, PFOSF as their precursor were used as water/oil repellents and surface acting agents. They were designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law and their manufacture, import and use are virtually prohibited. However, some uses of PFOS or its salts are approved based on the premise of stringent controls.

(12) Pentachlorobenzene

Pentachlorobenzene was used as fire retardants. It was designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law, and its manufacture, import and use are virtually prohibited. It has never been registered domestically as agricultural chemicals, while it has been applied for agricultural use overseas in the past.

As the sources and categories of emission and formation processes for pentachlorobenzene produced unintentionally are similar to those of dioxins, the measures currently taken for dioxins are expected to help reduce pentachlorobenzene concentrations as well. Since it is still detected in the environment, it is required to monitor the concentrations constantly as well as to promote measures to reduce its emissions.

(13) Chlordecone

Chlordecone is a kind of organochlorinated insecticide. It has never been registered domestically as agricultural chemicals, and there is no record of manufacture and import. It was designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law, and its manufacture, import and use are virtually prohibited.

(14) Endosulfan

Endosulfan is a kind of organochlorinated insecticide. Its registration expired in 2010 under the Agricultural Chemicals Regulation Law, and its distribution and use have been prohibited since April 2012 based on the law. Also, as described in Section 3 of Chapter 3, Government plans

to implement necessary measures in accordance with its designation under the Chemical Substances Control Law.

Chapter 3 Specific measures - strategy and elements of the National Implementation Plan

Section 1 Basic concept

The following is an overview of the basic concept of Japan about measures on the elimination and reduction of POPs emission.

It is important that Japan fully comply with the obligations under the Stockholm Convention, from the viewpoint of the protection of human health and conservation of the environment, as well as contribution to the international activities to eliminate and reduce emissions of hazardous chemical substances.

Recognizing the properties of POPs, the Japanese government, in cooperation with the other governments, the private sector and non-governmental organizations, will take measures to protect human health and the environment from the adverse effects caused by POPs at all stages of their lifecycles and will promote international cooperation in this connection.

Taking into account that developing countries (in particular the Least Developing Countries) and countries with economies in transition are more likely to suffer from health concerns resulting from local exposure to POPs, Japan will play a positive role to strengthen their national capabilities for the management of chemical substances including POPs (through the transfer of technology, the provision of financial and technical assistance and the promotion of cooperation among the Parties to the Stockholm Convention). We will also play a positive role in monitoring POPs at a regional level with a view to helping improve monitoring techniques and verifying the efficacy of measures in these regions.

Furthermore, keeping in mind the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development as set out in Article 1 of the Stockholm Convention, Japan will act through international cooperation as necessary to add new substances to the list of substances regulated under the Stockholm Convention.

Section 2 Effective implementation of the plan

1. Framework of implementation and cooperation among actors

The national implementation plan represents a plan to promote concrete measures required under the Stockholm Convention. Therefore, the main actor for its implementation is the government. However, in enforcing the Convention, all the actors concerned of civil society, which

are the government, local public authorities, businesses and citizens, all being mindful of their respective responsibilities set forth in the Basic Environment Law (Law No. 91 of 1993), must work closely with each other. This has to be achieved by sharing a common understanding and by acting in line with the basic concept set forth in the national implementation plan.

Ministries and Agencies of the central government should ensure close cooperation through the Inter-Ministerial General Directors' Meetings. They should develop and implement measures set forth in the national implementation plan in a comprehensive and well planned manner. Though these measures in the implementation plan are developed and implemented by the Ministries and/or Agencies concerned, their effective implementation can be ensured by strengthening cooperation and coordination among the Ministries and Agencies as well as by concerted action. Depending upon issues and measures, frameworks for the participation of and coordination with various stakeholders including local public authorities, businesses and civil society will be created. The provision of information through the use of information technology (IT) and the exchange of information through coordination meetings will also be promoted while the activities of various stakeholders will be positively supported and assisted.

Local public authorities are expected to implement the measures similar to those taken by the central government as well as their own particular measures in a comprehensive and well planned manner in consistency with the basic thinking set forth in the national implementation plan and by taking into account their specific regional natural and social conditions. It is important that in implementing these measures, they should ensure close coordination and cooperation among the local public authorities concerned and develop and implement these measures from the planning stage through the implementation stage with the participation of and coordination with the local communities, Non-Governmental Organizations (NGOs) and experts.

It is also important that businesses and citizens recognize the importance of measures against POPs issues, take into account fully the possible repercussions to POPs issues in their business operations, daily lives and production activities and act voluntarily and positively in line with the basic thinking of the national implementation plan.

Non-profit private sector organizations engaged in environmental conservation activities are expected to play a major role in environmental conservation through carrying out these activities in an institutional manner from the perspectives of promoting the public good. These actors are expected to make further contribution in terms of promoting various measures through their participation in environmental research and conservation activities as well as in environmental education and environmental learning.

Efforts to ensure the implementation of the national implementation plan shall be pursued through a coherent implementation framework put in place by the central government as well as coordination and cooperation among all the actors concerned of civil society.

With a view to ensuring the participation of and cooperation with various actors, the Government will also promote and facilitate the provision to the various actors of information on the contents of the Stockholm Convention, the purpose of the national implementation plan as well as measures which can be taken by each actor concerned.

Furthermore, in terms of ensuring global environmental protection, the Government has the obligation to contribute to international efforts in line with the implementation of domestic measures. Therefore, the government will work together with other developed countries on the implementation of the Stockholm Convention and provide assistance to developing countries.

2. Coordination of various national policies

Among the basic policies or plans closely related to measures against POPs pollution, there are the basic environment plan, the plan for reducing the quantity of dioxins released from business operations in Japan and the Basic Plan for polychlorinated biphenyls (PCB) Waste Treatment etc. Japan will ensure consistency and closer coordination between measures based upon these basic policies and plans on one hand and the national implementation plan on the other.

In addition, it is fully ensured that plans and measures of the central government which are likely to have implications on the measures against POPs should be in line with the basic thinking of the national implementation plan.

Section 3 Regulatory measures designed to prevent the manufacture, use, import and export of persistent organic pollutants.

Among the laws regulating the manufacture, use, import and export of POPs in Japan there are the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law, the Pharmaceutical Affairs Law and the Foreign Exchange and Foreign Trade Law. Under these laws regulatory measures are taken with respect to the manufacture, use, import and export of chemical substances equivalent to POPs in terms of all of their aspects or uses. The following is an overview of these laws.

1. Measures under the Chemical Substances Control Law

Under the Chemical Substances Control Law, chemical substances which possess low degradability (i.e. resistant to chemical change by way of naturally occurring chemical reactions), high bioaccumulation (likely to be accumulated in bodies of living organisms) and long-term

toxicity for humans or top predators (in cases of continuous ingestion, likely to be harmful to the survival or growth) are designated as Class I Specified Chemical Substance and are subject to regulatory measures such as prior notification for the manufacture/import (principally prohibited), limitation and prohibition of any use other than specified uses or mandatory reporting system etc. However, even when chemicals are designated as Class I Specified Chemical Substance, they still can be used under stringent control if no alternatives exist and their uses would not threaten human health. Also, if chemicals designated as Class I Specified Chemical Substance are contained in other chemicals only in small amounts as residues, they are not to be designated as Class I Specified Chemical Substance where it is confirmed that they do not pose any threats to human health through contamination of the environment, and their content rates have been lowered to technologically and economically possible levels.

Currently 28 chemical substances are designated as Class I Specified Chemical Substance including 19 groups of chemicals designated under the Stockholm Convention except PCDDs and PCDFs, which are not manufactured intentionally.

For PFOS or its salts, they are still approved for three uses including the manufacturing of the etching agent for the piezoelectric ceramic filter or composite semiconductor for high frequency band, the photosensitive film of semiconductors, and manufacturing of photographic film for industrial use. Standards for manufacturing equipment regarding PFOS or its salts, technical standards for PFOS or its salts and these three uses along with labeling matters at the time of transfer were established to ensure stringent control. Furthermore, for fire extinguisher, extinguishing agents for fire extinguisher and foam extinguishing agents that have been produced using PFOS or its salts, alternatives already exist, and they are unlikely to be manufactured/imported in the future. However, since large amounts have already been distributed domestically, and it is quite difficult to replace them with alternatives in the short-term, the standards and labeling matters to enable stringent control were prepared as provisional measures for the time being.

Also, for chemicals such as HCB that are found to exist as residues in other chemicals in small amounts, technologically and economically possible reduction levels were established individually, and business entities are requested to achieve further reductions.

Note that approximately 20,000 chemical substances which were manufactured or imported for commercial use when the law was promulgated are listed on the Existing Chemical Substances List. These substances shall gradually go through hazard assessment to determine degradability, level of bioaccumulation, toxicity and ecotoxicity.

Business entities intending to manufacture or import new chemical substances have to report the particulars of such chemical substances to the Minister of Health, Labour and Welfare, the Minister of Economy, Trade and Industry and the Ministry of the Environment, who shall assess

these chemical substances on the basis of the existing scientific knowledge and the data submitted by the business entities.

In the future as well, chemical substances similar to POPs possessing low degradation, high bioaccumulation, long-term toxicity for humans and long-term toxicity for top predators shall continue to be regulated.

Also, necessary measures will be implemented based on the Chemical Substances Control Law for endosulfan scheduled to enter into force as regulated chemicals under the Stockholm Convention on October 27, 2012.

2. Measures under the Agricultural Chemicals Regulation Law

It is stipulated under the Agricultural Chemicals Regulation Law that the distribution of the agricultural chemicals which meet the condition in item 2 to 7 of paragraph 1 of Article 3 shall be prohibited to prevent adverse effect on human health and environment under the ministerial ordinance on the basis of the stipulation of Article 9.2. The agricultural chemicals of which the distribution is prohibited shall also be prohibited to use by Article 11 of the law.

It has been currently prohibited under the law to distribute or use agricultural chemicals containing fourteen chemicals designated under the Stockholm Convention, including DDT, aldrin, dieldrin, endrin, chlordane, heptachlor, mirex, toxaphene, HCB, lindane, chlordecone, pentachlorobenzene, α-HCH, and β-HCH, or endosulfan.

The inspection method and the maximum content limit for dioxins in agricultural chemicals are stipulated in paragraph 3 of Article 14 of the Agricultural Chemicals Regulation Law. Also, the amount of the chemicals in all agricultural chemicals registered under the law has been below the stipulated level. Furthermore, for agricultural chemicals newly applied for registration, only those with the amount of the regulated chemicals found to be below the stipulated level through the inspection are to be registered.

3 Measures under the Pharmaceutical Affairs Law

Item 3, Paragraph 2, Article 14 of the Pharmaceutical Affairs Law (including cases where it shall read and apply pursuant to the provisions of the Article 83) stipulates that drugs, quasi-drugs and medical devices (hereafter referred to as drugs etc.), may be approved for marketing only after evaluation of their name, ingredients, composition, structure, dosage and administration, indications and usage, performance, side-effects etc.. Currently no drugs etc. containing the chemicals whose manufacture etc. is prohibited under the Stockholm Convention, are approved inside Japan.

4. Measures under the Foreign Exchange and Foreign Trade Law

The Export Trade Control Ordinance under the Foreign Exchange and Foreign Trade Law stipulates that POPs are subject to the requirement of export approval under Article 2 of the ordinance as goods listed in 2.35.3 of the schedule of the said ordinance. Under the Stockholm Convention not only the export of POPs themselves but also products containing POPs are subject to export control. The Operational Notification of the Export Trade Control Ordinance specifically defines the scope of products which shall be subject to the requirement of export approval. Its Cautionary Notes on export set forth the conditions of export approvals such as the prohibition of the export of products containing PCB.

Furthermore, the chemicals designated under the Stockholm Convention are itemized on the Published List of Imports as goods being subject to the requirement of import approval under the Import Trade Control Ordinance under the Foreign Exchange and Foreign Trade Law and their import is virtually prohibited. The Import Trade Control Ordinance regulates the import of POPs as a legal framework complimentary to the domestic laws governing the import of POPs (the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and the Pharmaceutical Affairs Law).

The Export Trade Control Ordinance and the Import Trade Control Ordinance stipulate that the POPs wastes shall be subject to the requirement of import or export approval. These Ordinances, together with the relevant laws (the Waste Management Law and the Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes (Law No. 108 of 1992) etc.) ensure that stockpiles and wastes are disposed of in an environmentally sound manner in compliance with paragraph 1 (d) of Article 6 of the Stockholm Convention.

Section 4 Action Plan for Reduction of Emissions of Unintentionally Produced Chemicals

1. Dioxins

(1) Current and future release estimates in Japan

The current estimated amounts of releases (as of 2010) in Japan are shown in the table below. Estimated releases in 1997 when legal regulation was introduced are also shown in the same table. In Japan, polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and coplanar PCBs are categorized as dioxins under the Dioxins Law.

Japan has limited land space available for sites for the final disposal of waste, and its hot and humid climate requires hygienic waste management. Therefore, waste disposal is mainly conducted by incineration. The ratio of municipal waste incinerated is as high as approximately 79%, making waste incinerators one of the main generation sources of dioxins.

Given this situation, as described below, measures against dioxins have mainly focused upon controlling releases from waste incinerators etc. Releases (estimate) in 2010 were 158-160 g-TEQ per annum, which represents a decline of approximately 98% from the level of releases in 1997 (7,680-8,135 g-TEQ per annum). Subsequently, environmental status has greatly improved, and as explained in Section 3, 1. (1), the proportion that has achieved the environmental standard stands at close to 100 percent (100 percent in the last five years in a row). Under these circumstances, release reduction measures will be implemented appropriately so that the current environmental status will not be exacerbated.

Source categories	Releases (g-TEQ per annum)	
	Estimated amount for 2010	Estimated amount for 1997 (Reference year)
Part II source	117 (water) 0.95	7,420-7,873 (water) 6.4
Waste incinerators	95 (water) 0.7	7,205-7,658 (water) 5.3
Production of pulp	0.24 （water） 0.24	0.74 (water) 0.74
Thermal processes in the metallurgical industry	21.9 （water） 0.011	213 (water) 0.35
Secondary copper production	-	0.053
Sinter plants in the iron and steel industry	10.9	135
Secondary aluminum production	8.7 (water) 0.011	31.0 (water) 0.34
Secondary zinc production	2.3 (water) 0.0004	47.4 (water) 0.0036
Part III source	36.5-38.3 (water) 0.06	250-253 (water) 4.9
Thermal processes in the metallurgical industry not mentioned in Part II	31.9	239
Fossil fuel-fired utility and industrial boilers	1.26	1.6
Firing installations for wood and other biomass fuels	0.073	0.042
Specific chemical production processes[*2]	0.57 (water) 0.06	5.1 (water) 4.9
Crematoria	1.2-3.0	2.1-4.6
Motor vehicles	1.0	1.4
Smoldering of copper cables	0.53	1.2

Other sources	4.6 (water) 0.50	10.1-10.2 (water) 1.4
Total	158-160 (water) 1.5	7,680-8,135 (water) 12.8

Note1: “Fossil fuel-fired utility and industrial boilers” means thermal power plants, and “Firing installations for wood and other biomass fuels” means craft pulp recovery boilers in paper and pulp production processes. The estimates for releases from the other facilities in these source categories are not accounted.

Note 2: “Water” in the table means amount released into water as part of releases.

Note 3: The hyphen (-) in the table means that there was no record of operation in the year.

Note 4: As all the figures in the table have been rounded, adding all the figures in brackets will not produce the same figures as those in the brackets showing totals.

Note 5: Releases from cement kilns firing hazardous waste are included in the figure for waste incinerators.

(2) Effectiveness evaluation of the laws and policies concerning release control

A) Overall system of the laws and policies

In Japan, regulatory measures were started in 1997 to control releases of dioxins from waste incinerators and electric steel-making furnaces under the Air Pollution Control Law and the Waste Management Law. Subsequently, the target facilities subject to regulation have been expanded under the Dioxins Law. The institutional framework was put in place for enforcing comprehensive measures including the establishment of environmental quality standards, monitoring trends of environmental pollution, establishing Plans of Measures Against Soil Contamination by Dioxins (hereafter referred to as “Plans of Measures”) and a plan for reducing the release of dioxins.

Environmental quality standards

Media	Standard
The ambient air	Not more than 0.6 pg-TEQ/m^3
The waters (excluding the bottom sediment)	Not more than 1 pg-TEQ/L
The bottom sediment	Not more than 150 pg-TEQ/g
The soil	Not more than 1,000 pg-TEQ/g

Note:

*The standards are in 2, 3, 7, 8-TeCDD toxicity equivalent

* The standards for the ambient air and the waters (excluding bottom sediment) are on an annual average basis.

As for measures to control releases, the national government specifies the facilities subject to the regulation, according to the amount released, the concentration of dioxins released, etc. When fixing the release standards it shall take into account feasible technical levels and scale of facilities etc. Waste incinerators are also subject to more stringent controls than Dioxins Law on

the release of dioxins in accordance with the standards for the structure and maintenance/management of incinerators set forth under the Waste Management Law.

Under the Dioxins Law, any person installing facilities shall at least once a year measure the status of dioxins pollution caused by gases and water released from the facilities, and shall report to the Prefectural Governor.

Emission standards

(Unit: ng-TEQ/Nm^3)

Type of Specified Facilities	Scale of facilities (Capacity of incineration)	Standards for new facilities	Standards for existing facilities
Waste incinerators (hearth area is more than 0.5 m^2 or capacity of Incineration is more than 50 kg/h)	More than 4t/h	0.1	1
	2t/h-4t/h	1	5
	Below 2t/h	5	10
Electric steel-making furnaces		0.5	5
Sintering facilities for steel industry		0.1	1
Facilities for recovering zinc		1	10
Facilities for manufacturing aluminum base alloy		1	5

Note: Regarding newly constructed waste incinerators (capacity is more than 200kg/h) and electric steel-making furnaces to which the standards for controlling designated materials in the Air Pollutions Control Law have already applied, emission standards in the above chart for a new facility are applied.

Effluent standards

(Unit: pg-TEQ/L)

Type of Specified Facilities	Standard
- Bleaching facilities using chlorine or chlorine compounds used for manufacturing sulfate pulps (kraft pulps) or sulfite pulps - Cleansing facilities for acetylene used for manufacturing acetylene by carbide method - Cleansing facilities for waste gas used for manufacturing potassium sulfate - Cleansing facilities for waste gas used for manufacturing alumina fiber - Waste gas cleaning facilities, among facilities to dispose of gas generated from baking furnace used for manufacturing supported catalysts (limited to the manufacture with the use of chlorine or its compounds) - Cleansing facilities for dichloroethane used for manufacturing vinyl chloride monomer - Sulfuric acid concentration facilities, cyclohexane separation facilities, and waste gas cleansing facilities used for manufacturing caprolactam (limited to using nitrosyl chloride)	10

- Water washing facilities and waste gas cleansing facilities used for manufacturing chlorobenzene or dichlorobenzene - Filtering facilities, drying facilities, and waste gas cleansing facilities used for manufacturing sodium hydrogen 4-chlorophthalate - Filtering facilities and waste gas cleansing facilities for waste gas used for manufacturing 2,3-dichloro-1,4-naphthoquinone - Nitro-derivative and its reductant separation facilities, nitro-derivative and its reductant cleansing facilities, dioxazineviolet cleansing facilities, and hot-air drying facilities used for manufacturing dioxazineviolet - Cleansing facilities for waste water and wet dust collecting facilities relating to roasting furnaces, melting furnaces, or dry kilns used for manufacturing aluminum or aluminum base alloy - Refining facilities, waste gas cleansing facilities, and wet dust collecting facilities used for recovering zinc (limited to zinc collection from dust that is generated from electric steel-making furnaces and collected by dust-collector) - Cleansing facilities for waste gas, wet dust collecting facilities, and ash storing facilities discharging polluted water or wastewater, which are related to waste incinerators (hearth area is more than 0.5 m^2 or capacity of incineration 50 kg/h) - Resolving facilities for waste PCB or PCB-processed matter, and cleansing facilities and sorting facilities for PCB-contaminated matter or PCB-processed matter - Facilities for disposing water discharged from plats or business places with facilities mentioned above - Terminal treatment facilities of sewerage relating to facilities mentioned above	

Note: The standard relating to water discharged from terminal waste disposal facilities is 10 pg-TEQ/L based on instructions stipulating standards for maintenance and management based on the Waste Management Law.

Under the Dioxins Law, Prefectural Governors shall monitor from time to time the level of pollution of ambient air, public water, bottom sediment and soil caused by dioxins.

With respect to measures against contaminated soil, an institutional framework is already in place whereby the Prefectural Governors shall designate the controlled areas against soil contamination by dioxins (hereinafter referred to as “controlled areas”); shall establish Plans of Measures; and, shall implement operations including the removal of soil contamination in cooperation with stakeholders at the expense of polluters etc. under the Plans of Measures.

Furthermore, with respect to polluted bottom sediments, counter-measures including the removal of such pollution etc. or studies on them are undertaken in accordance with the Guideline concerning the Treatment and Disposal of Bottom Sediment issued by the Ministry of the Environment. Financial support is provided to the relevant local public authorities to appropriately promote the dismantling of general waste incinerators at the time of decommission, and encourage the effective reuse of vacant lots.

The central government provides financial assistance to local public authorities to facilitate the dismantling conducted along with facilities improvement at such sites to promote the

dismantling of general waste incinerators at the time of their decommission, and encourage the effective re-use of such sites.

Furthermore, in the following areas the national government shall establish the Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan (hereafter referred to as Reduction Plan), in order to ensure the comprehensive and integrated implementation of various release reduction measures within the above-mentioned institutional framework of the laws and policies concerning dioxins:

(a) Reduction targets relating to the estimated amount of dioxins emissions categorized by field of business activities in Japan
(b) Measures for businesses in order to achieve reduction targets provided in the preceding item.
(c) Measures to be taken by the national government and local public authorities to promote the recycling and reuse of resources, and to reduce waste which could form dioxins..
(d) Other matters to reduce dioxins resulting from business activities in Japan.

The following is an overview of the third Reduction Plan as modified in August, 2012:

As regards (a) above, the aggregate reduction target set on each business field shall be 176 g-TEQ per annum in the immediate future after 2012.

The measures to be taken by business entities in connection with (b) above are as follows:

(i) Compliance with emission standards etc.

Compliance with emission standard for the emission gas and effluent standard for the effluent water etc.; prevention of environmental pollution caused by dioxins; measures in case of accidents; measurements on the status of pollution by dioxins; appointment of pollution control supervisors etc.; and, prohibition of open burning of waste.

(ii) Report dioxins releases etc. by businesses

Report of release etc. of designated chemical substances etc. in compliance with the Chemical Substances Release Reporting and Management Promoting Law, formulation of operational guidelines, taking note of the Chemical Substance Management Guidelines, implementation of release reduction measures such as checkup and improvement of the facilities, and enhancement of the general public’s awareness of the measures.

(iii) Promotion of reducing, reuse and recycling waste etc., that could form dioxins.

Measures to be taken by the government and local public authorities in conjunction with (c) above:

(i) Promotion of measures to reduce the amounts of waste etc.

Promotion of measures under the Fundamental Law for Establishing a Sound Material-Cycle Society (Law No. 110 of 2000), the Waste Management Law etc and assistance to equipment investment required for waste reduction

(ii) Achievement of reduction targets for waste etc.

(iii) Others

Reduction and proper disposal of wastes etc. from public facilities; enhancing environmental education/learning

As regards (d) above

(i) Appropriate and smooth implementation of the Stockholm Convention

(ii) Promotion of measures for sources of dioxins

Promotion of measures against waste; promotion of measures against unregulated sources etc.;

(iii) Prohibition of open burning without using a proper incinerator

(iv) Report dioxins releases etc.

Publication of release inventory of dioxins; implementation of monitoring and surveys on the actual status of dioxins releases and implementation of measures based on the results; and, promotion of effective and efficient measurements and QA/QC.

(v) Promotion of research and investigations and technological development activities regarding dioxins

(vi) Publication of accurate information and enhancement of disclosure to the general public enhancement of publication and disclosure of information; and, systematic activities designed to enhance public awareness.

(For details refer to the annexed Reduction Plan)

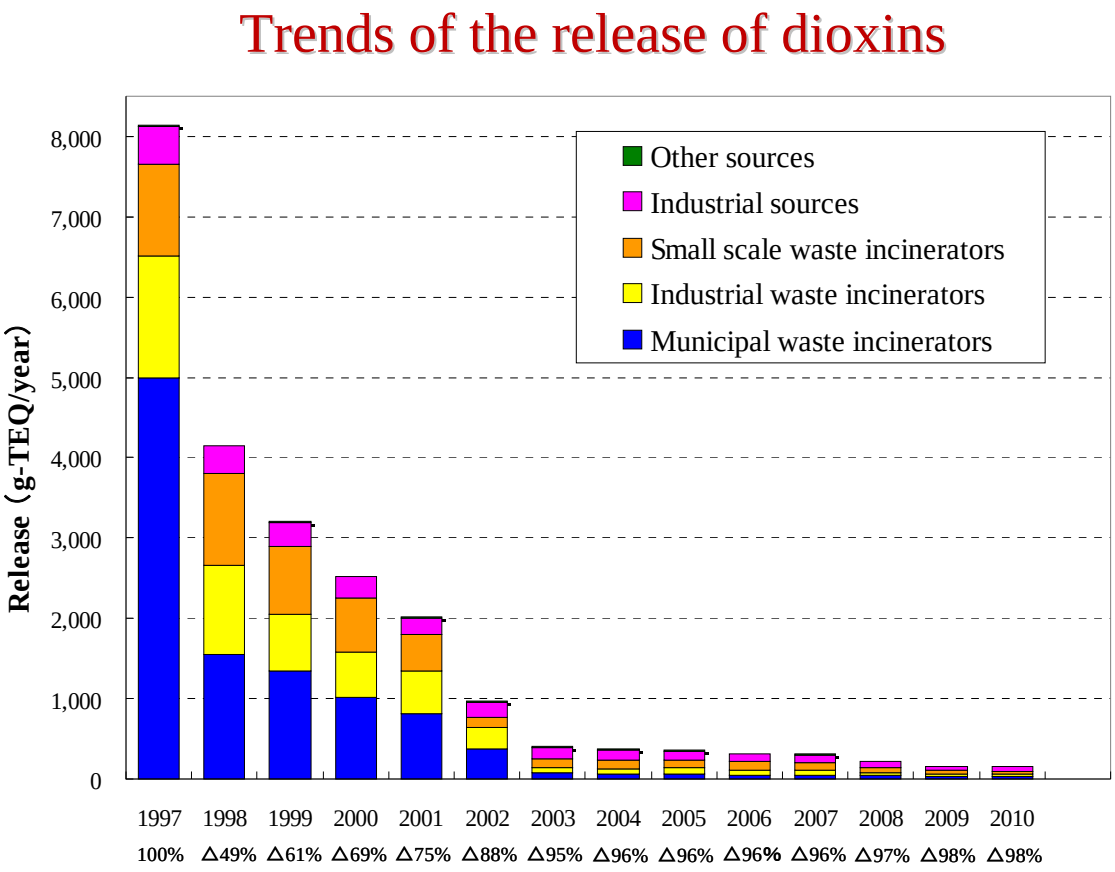
B) Assessing the effectiveness of laws and policies

As a result of the measures taken so far, releases of dioxins are estimated to have been reduced by approximately 98% in 2010 from the level in 1997, and this exceeds the reduction target established by the second Reduction Plan (The reduction target as of the end of 2010: 315-343 g-TEQ/year).

As is clear from this, Japan has continued to take measures to reduce releases of dioxins

at a realistic and meaningful level as provided for in Article 5 of the Stockholm Convention.

Article 5 of the Convention stipulates that the Parties shall promote the use of the best available techniques (BAT) and best environmental practices (BEP), and that the Conference of the Parties shall adopt the general guidance to be taken into consideration when applying BAT and BEP. At the third Conference of the Parties of the Stockholm Convention held in May 2007, the guidelines and guidance were adopted, which is to be taken into consideration when applying BAT and BEP (hereafter referred to as the BAT and BEP guidelines). As a result, Japan has been requiring or promoting the use of BAT and BEP, while taking into consideration the BAT and BEP guidelines. Japan will continue to make such efforts.



(3) Strategy to promote the reduction of total releases

A) Promotion of Reduction Plan

Because dioxins are unintentionally produced when burning materials, it is important that continued measures should be taken to reduce releases. Therefore, Japan will continue to steadily take the measures incorporated into the third Reduction Plan completed in August, 2012 toward achieving the goal established by the plan.

B) Use of BAT and BEP

Under Article 5 of the Stockholm Convention, Japan will continue to take measures for reducing releases through the use of BAT and BEP for each source category provided for in Annex C of the Stockholm Convention, taking into consideration the draft BAT and BEP guidelines, with a view to achieving the goal of continuing to minimize the release of dioxins, and where feasible, their elimination.

(A) Source categories in Part II of Annex C of the Stockholm Convention

(A-1)Measures taken and status of amounts of releases etc.

The measures taken and amounts of releases etc. related to each individual source category are as follows. Among the source categories mentioned in Part II in Annex C of the Stockholm Convention, both new and existing sources other than those related to secondary copper production are subject to legal regulations according to the amount released.

(a) Waste incinerators

(Measures taken)

- With respect to emission gas from waste incinerators with a hearth area of 0.5 m^2 or more, or with an incineration capacity of 50 kg/h or more, the emission standard is established under the Dioxins Law according to the size of an incinerator or depending upon whether an incinerator is a newly constructed one or an existing one. The emission standard is supposed to be established at a level that is attainable when technically feasible measures are taken. The emission standard for newly constructed large-scale incinerators (with an incineration capacity of 4,000 kg/h or more) is 0.1 ng-TEQ/m^3N. Cement kilns combusting waste regulated under the Waste Management Law are also regulated as waste incinerators under the Dioxin Regulation Act. The effluent standard (10 pg-TEQ/L) is set for effluent from the business establishments having cleansing facilities for waste gas, wet dust collecting facilities, and ash storing facilities discharging polluted water or wastewater, which are related to waste incinerators.
- In addition, the treatment standard for controlling the generation of dioxins is set forth under the Waste Management Law for all waste incinerators including those with an incineration capacity of below 50 kg/h. For an incinerator with an incineration capacity of 200 kg/h or more, a more detailed standard is set forth with respect to its structural and maintenance/management requirements with a view to controlling the generation and the release of dioxins.

(Amounts of releases etc.)

- As of the end of March 2011, there were 10,088 waste incinerators subject to the emission standard under the Dioxins Law and 2,994 specified facilities subject to the effluent standard which were related to waste incinerators. The amounts of releases of dioxins from waste incinerators including these facilities is estimated to be in the range of 95 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.7 g-TEQ per annum.

(b) Production of pulp

(Measures taken)

- For wastewater discharged from bleaching facilities using chlorine or chlorine compounds used for manufacturing sulfate pulps (kraft pulps) or sulfite pulps, the effluent standard (10 pg-TEQ/L) is set forth under the Dioxins Law and it actually meets the APL.

(Amounts of releases etc.)

- As of the end of March 2011, there were 75 specified facilities subject to the effluent standard under the Dioxins Law. The amounts of releases of dioxins into waters from pulp production plants are estimated to be 0.24 g-TEQ per annum.

(c) Sinter plants in the iron and steel industry

(Measures taken)

- For sinter plants in the iron industry, the emission standard is set forth under the Dioxins Law, depending upon whether the plant is a new one or an existing one. The emission standard for new ones is set at 0.1 ng-TEQ/m^3N, which meets the APL.

(Amounts of releases etc.)

- As of the end of March 2011, there were 26 specified facilities under the Dioxins Law. The amounts of releases of dioxins from sinter plants are estimated to be 10.9 g-TEQ per annum.

(d) Secondary aluminum production (Manufacturing aluminum base alloy)

(Measures taken)

- For facilities for manufacturing aluminum base alloy in Japan which are equivalent to secondary aluminum production facilities in the metallurgical industry in Part II of Annex C of the Stockholm Convention the emission standard is set forth under the Dioxins Law, depending upon whether the plant is a new one or an existing one. The release standard for new ones is set at 1 ng-TEQ/m^3N, which does not meet the APL. The effluent standard (10 pg-TEQ/L) is set forth for effluent from the business establishments having cleansing facilities

for waste gas and wet dust collecting facilities relating to roasting furnaces, melting furnaces, or dry kilns for manufacturing aluminum or aluminum base alloy.

(Amounts of releases etc.)

- As of the end of March 2011, there were 815 specified facilities subject to the emission standard under the Dioxins Law and 81 specified facilities subject to the effluent standard. The amount of releases of dioxins from facilities for manufacturing aluminum base alloy are estimated to be in the order of 8.7 g-TEQ per annum, of which releases into waters are estimated to be in the order of 0.011 g-TEQ per annum.

(e) Secondary zinc production (Facilities for recovering zinc)

(Measures taken)

- For facilities for recovering zinc in Japan which are equivalent to facilities for secondary zinc production in the metallurgical industry in Part II of Annex C of the Stockholm Convention, the emission standard is set forth under the Dioxins Law, depending upon whether a plant is a new one or an existing one. The emission gas standard for new ones is set at 1 ng-TEQ/m^3N, which does not meet the APL. The effluent standard (10 pg-TEQ/L) is set forth for effluent from the business establishments having refining facilities, waste gas cleansing facilities, and wet dust collecting facilities used for recovering zinc.

(Amounts of releases etc.)

- As of the end of March 2011, there were 34 specified facilities subject to the emission standard under the Dioxins Law and 45 specified facilities subject to the effluent standard. The amounts of releases of dioxins from facilities for recovering zinc are estimated to be in the order of 2.3 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.0004 g-TEQ per annum.

(f) Secondary copper production (Facilities for recovering copper)

- There is one copper recovery plant in Japan that is equivalent to the facilities for secondary copper production in the metallurgical industry in Part II of Annex C of the Stockholm Convention and this plant was out of operation in 2011. There is no likelihood that a new plant will be constructed for the time being. As a result, it is predicted that the level of scrap copper treatment in the facilities for recovering copper in Japan will remain flat or tend to decline. Therefore, no release control is actually being implemented under the Dioxins Law.

(A-2) Policies on future measures

Article 5(d) of the Stockholm Convention requires the use of best available techniques (BAT) and best environmental practices (BEP) for sources that fall within the purview of the above-mentioned sources (except facilities for recovering copper mentioned in (f) above). For these sources, BAT and BEP shall be promoted continuously, taking into account the BAT and BEP guidelines etc.

Also, continued efforts will be made to provide tax and financial incentives with a view to facilitating the replacement of facilities and measures for reducing releases.

(B) Source categories in Part III of Annex C of the Stockholm Convention

(B-1) Measures taken and status of amounts of releases etc.

The measures taken and amounts of releases related to each individual source category are as follows. Measures including regulatory framework have been already been put in place for some of source categories in Part II of Annex C of the Stockholm Convention.

(a) Open burning of waste

(Measures taken)

- As the rule, the open burning of waste is prohibited under the Waste Management Law and the Offensive Odor Control Law (Law No 91 of 1971)

(b) Thermal processes in the metallurgical industry not in Part II of Annex C of the Stockholm Convention

(Measures taken)

- For an electric steel-making furnaces for secondary steel production, the emission standard is set forth under the Dioxins Law, depending upon whether the furnace is a new one or an existing one. The emission standard for new ones is set at 0.5 ng-TEQ/m^3N.

(Amounts of releases etc.)

- As of the end of March 2011, there were 114 specified facilities subject to the emission standard under the Dioxins Law. The amounts of releases of dioxins from electric steel-making furnaces are estimated to be 30.1 g-TEQ per annum.

(c) Specific chemical production processes

(Measures taken)

- Effluent from the business establishments having facilities used for the production of each of

the following chemicals is subject to the effluent standard (10 pg-TEQ/L) set forth under the Dioxins Law.

- Vinyl chloride monomer (Dichloroethane cleansing facilities)
- Caprolactam (limited to using nitrosyl chloride)(Sulfuric acid concentration facilities, cyclohexane separation facilities, and waste gas cleansing facilities)
- Chlorobenzene or dichlorobenzene (water washing facilities and waste gas cleansing facilities)
- Sodium hydrogen 4-chlorophthlate (Filtering facilities, drying facilities, and waste gas cleansing facilities)
- 2,3-dichloro-1,4-naphthoquinone (Filtering facilities and waste gas cleansing facilities)
- -Dioxazineviolet (Nitro-derivative and its reductant separation facilities, nitro-derivative and its reductant cleansing facilities, dioxazineviolet cleansing facilities, and hot-air drying facilities)
- Potassium sulfate (Waste gas cleansing facilities)
- Acetylene by carbide method (Acetylene cleansing facilities)

(Amounts of releases etc.)

- As of the end of March 2011, there were 105 specified facilities subject to the effluent standard under the Dioxins Law. The amounts of releases of dioxins into waters from facilities for the production of these chemicals are estimated to be 0.06 g-TEQ per annum in 2010. Although these facilities are not subject to the emission standard, amounts of dioxins released into the air would be estimated to be 0.57 g-TEQ per annum if amounts released from these facilities were included in the calculation.

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(d) Crematoria

(Measures taken)

- For crematorium in March 2000 “The Guidelines for Counter-measures for Reducing the Generation of Dioxins from Crematoria” was prepared and widely publicized. Now, measures are taken to reduce the release of dioxins for the facilities and their management/operation.

(Amounts of releases etc.)

- The amounts of releases of dioxins from crematoria are estimated to be 1.2-3.0 g-TEQ per annum.

(e) Motor vehicles

(Measures taken)

- Gasoline-powered motor vehicles are subject to fuel regulation under the Air Pollution Control Law, which prohibits the use of leaded gasoline.
- For diesel engine motor vehicles, regulations concerning particulate matters have been implemented since October 1993, and enhanced gradually. Most recently, new long-term regulations entered into force in October 2009, and the standard for motor vehicle waste gas emission control concerning particulate matters was further enhanced. Subsequently, every diesel engine motor vehicle is to be equipped with a diesel particulate filter (DPF).

(Amounts of releases etc.)

- The amounts of releases of dioxins from motor vehicles are estimated to be 1.0 g-TEQ per annum.

(f) Shredder plants for the treatment of end-of-life vehicles

(Measures taken)

- Under the Law for the Recycling of End-of-Life Vehicles (Law No 87 of 2002), measures for reducing waste relating to end-of-life motor vehicles are facilitated.

(B-2) Policies on future measures

In compliance with Article 5(e) of the Stockholm Convention, Japan will promote the use of BAT and BEP, taking into consideration the BAT and BEP guidelines.

Because sufficient information on the source categories in Annex C of the Stockholm Convention is not available, it will make systematic efforts to collect data on amounts of releases etc., and examine the prioritization of measures and their technical feasibility etc., and the necessary measures shall be taken based upon the results of those studies.

(4) Measures to promote educational and training activities, and to enhance public awareness

The following measures will be taken under the Reduction Plan to promote educational and training activities, and to enhance public awareness:

- A wide range of integrated environmental education/learning, designed for promoting the reduction of waste etc., including controlling waste discharges and promoting recycling, and exchanges of personnel and information between the public sector and the private sector will be promoted under the Fundamental Law for Establishing a Sound Material-Cycle Society. Infrastructure building will be promoted to enhance the supply and the diffusion of

information, personnel training, and further systematization of educational programs, in order to ensure that environmental education/learning including that designed to reduce waste discharges will be promoted at schools, within the family, in workplaces, in local communities, and any other places etc. under the Law for Enhancing Motivation on Environmental Conservation and Promoting of Environmental Education (Law No. 130 of 2003).

- Systematic training shall be provided to technical experts working in official testing organizations of local public authorities etc. to help them enhance their understanding of analytical techniques and their skills for using the technologies.
- To ensure people's better understanding and their more cooperation in addressing issues of dioxins, the government will intensify its unified and systematic public awareness activities such as preparing an inter-ministerial pamphlet, and issuing an annual report, which will enlighten the general public on the current situation and future agendas in national efforts toward the goal of building a recycling and reuse-oriented society, with the objective of disclosing and publishing to the public, in a prompt and easily understandable manner, accurate information concerning the impacts of dioxins on human health and the environment, the results of research and development, and international trends, including relevant statistical data and their actual implications.

  Furthermore, the government will make best efforts to provide accurate information on dioxins through its periodicals, the internet, and mass media etc. The government will also take every opportunity to encourage the public to review their senses of value and lifestyles and shift them to generate and discharge less waste.

(5) Contribution to international community

Japan will make its due contribution in terms of transferring its knowledge, experience, and technology on measures against dioxins and waste management by meeting requests from developing countries and from countries with economies in transition.

(6) Evaluation and revision of action plan

Based on the trend etc. of amounts of releases of dioxins, the government will evaluate the implementation of the action plan every five years, and will revise the action plan if necessary.

(7) Schedule for implementing the action plan

The various existing measures for reducing releases shall be implemented adequately so that the current environmental status will not be exacerbated.

2. Hexachlorobenzene (HCB)

(1) HCB release in Japan

Estimates on domestic HCB emissions in 2009 and 2002, the year when the estimation of HCB emission started, are as follows:

Source of emission	Emission (kg/year) (Estimates) 2009	2002
Part II Source categories	53	85
Waste incinerators	22	44 (Water) 0.061
Cement kilns	10	11
Production of pulp	NO	0.080 (Water) 0.080
Thermal processes in the metallurgical industry	21	30
Secondary copper production	NO	NO
Sinter plants in the iron and steel industry	14	16
Secondary aluminum production	2.2	3.0
Secondary zinc production	4.5	11
Part III Source categories	54	100
Thermal processes in the metallurgical industry not mentioned in Part II	53	100
Fossil fuel-fired utility and industrial boilers	0.22	0.38
Firing installations for wood and other biomass fuels	0.21	0.034
Specific chemical production processes	0.26	0.24
Crematoria	0.14	0.16
Motor vehicles	0.05	NE
Smoldering of copper cables	0.34	0.42
Other source categories	1.0	1.9
Total	110	190

NE: Not Estimated NO: Not Occurring

Note 1: "Water" means amount released into water as part of releases.

Note 2: The total figure is not compatible with the sum of figures in each column due to rounding.

Note 3: HCB emission estimation was made using emission factors calculated based on measured data obtained from domestic sampling survey.

(2) Measures to reduce HCB release

It was confirmed based on survey conducted for domestic operating facilities that HCB produced unintentionally was generated from heat combustion processes similar to those for dioxins, and HCB releases from thermal processes in the metallurgical industry and waste

incineration facilities were relatively larger.

Also, it was estimated that HCB release reduced by approximately 40% from 2002 to 2009.

In light of the above, efforts will be made to reduce HCB releases to the air through measures stipulated in the dioxins reduction plan mentioned in Section 4, 1. Furthermore, a survey will be conducted with a focus on major source categories at operating facilities to determine HCB release reduction effects achieved with dioxins release reduction measures.

Also, a continuous survey will be conducted for various source categories to maintain HCB release data. Based on the survey results, efforts to promote additional measures will be made such as dissemination and awareness raising through provision of useful information regarding release reduction.

3. Polychlorinated biphenyl (PCB)

(1) PCB release in Japan

Estimates on domestic PCB emissions in 2009 and 2002, the year when the estimation of PCB emission was started, are as follows:

Source of emission	Emission (kg/year) (Estimates) 2009	2002
Part II Source categories	480	450
Waste incinerators	18	15 (Water) 0.18
Cement kilns	370	350
Production of pulp	NO	5.7 (Water) 5.7
Thermal processes in the metallurgical industry	89	82
Secondary copper production	NO	NO
Sinter plants in the iron and steel industry	40	45
Secondary aluminum production	7.1	10
Secondary zinc production	41	26
Part III Source categories	69	100
Thermal processes in the metallurgical industry not mentioned in Part II	67	100
Fossil fuel-fired utility and industrial boilers	0.68	0.84
Firing installations for wood and other biomass fuels	0.22	0.28
Specific chemical production processes	0.031	0.031
Crematoria	0.40	0.44

Motor vehicles	1.1	NE
Smoldering of copper cables	0.068	0.084
Other source categories	3.3	5.1
Total	550	560

NE: Not Estimated NO: Not Occurring

Note 1: "Water" means amount released into water as part of releases.

Note 2: PCB release estimation was made based on measured values of all isomers (209 kinds). When only measured values of highly toxic dioxin-like PCBs (dlPCB) or those of PCB congeners with the number of chlorine 3 – 7 (T3CB - H7CB) were considered, PCB releases were estimated as follows.

	dlPCB emission (kg/year)（Estimates）		T3CB - H7CB emission (kg/year)（Estimates）	
	2009	2002	2009	2002
Part II source categories	3.1	3.8	99	66
Part III source categories	1.7	2.2	36	65
Other source categories	0.12	0.16	2.2	2.8
Total	4.9	6.2	140	130

Note 3: The total figure is not compatible with the sum of figures in each column due to rounding.

Note 4: PCB release estimation was made using emission factors calculated based on measured data obtained from domestic sampling survey.

(2) Measures to reduce PCB release

It was confirmed based on a survey conducted for domestic operating facilities that PCB produced unintentionally was generated from heat combustion processes similar to those for dioxins, and PCB releases from cement kilns and thermal processes in the metallurgical industry were relatively larger.

Also, while it was estimated that PCB releases from the Part III source categories reduced by approximately 30% from 2002 to 2009, emissions increased from cement kilns, secondary zinc production and waste incinerators. For this reason, it was estimated that the total emissions remained almost the same.

For PCB unintentionally produced, it has been expected to date that generation/waste gas control measures similar to release reduction measures for dioxins would be effective. Since emissions from some of the source categories reduced, measures in the dioxins reduction plan described in Section 4, 1 will continue to be applied for the reduction of PCB releases. Meanwhile, as reduction measures for dioxins have not necessarily led to sufficient PCB release reductions in some cases, release reduction effects will continue to be confirmed that will be achieved through those measures. Furthermore, a survey will be conducted with a focus on major source categories at operating facilities where PCB releases increased, and considerations will be given to PCB release reductions.

Also, a continuous survey will be conducted for various source categories to maintain HCB emission data. Based on the survey results, efforts to promote additional measures will be made such as dissemination and awareness raising through provision of useful information regarding release reduction.

For emissions into water, monitoring of effluent will be continued under the Water Pollution Control Law, which already requires the PCB content of effluent to be below 0.003 mg/L.

4. Pentachlorobenzene（PeCB）

(1) PeCB release in Japan

Estimates on domestic PeCB emissions in 2009 are as follows:

Source of emission	Emission (kg/year)（Estimates） 2009
Part II Source categories	150
Waste incinerators	82
Cement kilns	61
Production of pulp	NO
Thermal processes in the metallurgical industry	7
Secondary copper production	NO
Sinter plants in the iron and steel industry	NE
Secondary aluminum production	0.16
Secondary zinc production	6.8
Part III Source categories	25
Thermal processes in the metallurgical industry not mentioned in Part II	25
Fossil fuel-fired utility and industrial boilers	NE
Firing installations for wood and other biomass fuels	NE
Specific chemical production processes	NE
Crematoria	NE
Motor vehicles	NE
Smoldering of copper cables	NE
Other source categories	NE
Total	180

NE: Not Estimated NO: Not Occurring

Note 1: The total figure is not compatible with the sum of figures in each column due to rounding.

Note 2: PeCB emission estimation was made using emission factors calculated based on measured data obtained from domestic sampling survey.

(2) Measures to reduce PeCB release

PeCB produced unintentionally is considered to be generated from heat combustion processes similar to those for dioxins. Accordingly, it is expected that generation/waste gas control measures similar to release reduction measures for dioxins would be effective, and therefore, measures in the dioxins reduction plan described in Section 4, 1 will continue to be applied for the reduction of PeCB emissions.

Furthermore, a continuous survey will be conducted for various source categories to maintain PeCB emission data. Based on the survey results, efforts to promote additional measures will be made such as dissemination and awareness raising of business entities through provision of useful information regarding release reduction.

Section 5 Measures to eliminate polychlorinated biphenyl

1. Ban on use

An administrative guidance was issued in 1972 to voluntarily refrain from using PCB-containing devices that should not be distributed as regulated under the Stockholm Convention. In 1973, the Chemical Substances Control Law was enforced to ban the manufacture and use of PCB, practically prohibiting the import of PCB and PCB-containing devices. The Electricity Utilities Industry Law (Law No. 170 of 1964) enforced in 1976 to ban the installation of electric machinery and devices using PCB-containing insulation oils on power circuit.

Among devices containing PCB that should not be distributed as regulated under the Stockholm Convention, transformers, power condensers and some other devices are still being used. Users are required to strictly monitor and control these devices while performing appropriate inspection and maintenance.

2. Elimination

The government will implement a project to develop wide-area waste disposal facilities nationwide in the pivotal cities of Kitakyushu, Toyota, Tokyo, Osaka and Muroran, as listed below, through the Japan Environmental Safety Corporation (JESCO), and in co-ordination with local public authorities.

Most PCB wastes come from high-voltage transformers and contaminants etc., and these would require immediate attention. The project will therefore focus on these products.

Project office	Address	Project site	Project facilities	Treatment capacity	Project period
Kitakyushu	Hibikimachi 1-chome, Wakamatsu Ward, Kitakyushu, Fukuoka Pref.	Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima, Okinawa	Stage I facilities will primarily process high-voltage transformers and waste PCBs left in Kitakyushu. Stage II facilities will cover high-voltage transformers, waste PCBs and contaminants etc. existing in all project sites.	1.5 t/day of high-voltage transformers and waste PCBs etc. (in PCB decomposition) 10.4 t/day of contaminants etc. (contaminants equivalence)	Waste disposal to start in December 2004. Project to terminate in March 2016.
Toyota	Hosoyacho 3-chome, Toyota, Aichi Pref.	Gifu, Shizuoka, Aichi, Mie	High-voltage transformers, waste PCBs, and other devices and materials	1.6 t/day (in PCB decomposition)	Waste disposal to start September 2005. Project to terminate in March 2016.
Tokyo	Omi 2-chome, Koto Ward, Tokyo	Saitama, Chiba, Tokyo, Kanagawa	Disused transformers, condensers and stabilizers, waste PCBs, and other devices and materials	2 t/day (in PCB decomposition)	Waste disposal to start in November 2005. Project to terminate in March 2016.
Osaka	Hokuko Shiratsu 2-chome, Konohana Ward, Osaka	Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama	High-voltage transformers, waste PCBs and other devices and materials	2 t/day (in PCB decomposition)	Waste disposal to start in August 2006. Project to terminate in March 2016.
Hokkaido	Nakamachi, Muroran, Hokkaido	Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima, Ibaraki, Tochigi, Gunma, Niigata, Toyama, Ishikawa, Fukui, Yamanashi, Nagano	High-voltage transformers, waste PCBs, contaminants etc. and other devices and materials	1.8 t/day of high-voltage transformers and waste PCBs etc. (in PCB decomposition) The facility capacity will be determined based on data on PCB volumes requiring treatment.	Waste disposal to start earliest after April 2008. Project to terminate in March 2016.

(Note) The facility capacity for contaminants in Hokkaido will be at more than 8 ton/day for the time being.

Enterprises which hold large volumes of waste PCBs, PCB-containing waste oils and disused pole-mounted transformers that contain PCB-containing insulation oils are building or planning to build treatment facilities on their own. It is essential for the government to assist and

encourage their effort. For pole-mounted transformers and insulation oils extracted from these pole-mounted transformers, concerted actions will be taken in line with the efforts of electric power companies and so on which store those PCB wastes.

Based on the Basic Plan for PCB Waste Treatment prepared in 2003, Tables (1), (2) and (3) show the estimated disused volume, storage volume and disposal volume of wastes generated from disuse of PCB-containing high-voltage transformers and high-voltage condensers, and other electrical devices as large as these (hereafter referred to as “high-voltage transformers and other devices”) during the period to July 2016, when treatment of PCB wastes is to be terminated under the law. They also show the estimated disused volume, storage volume and disposal volume of wastes at the end of FY2008, half way through the final year of the plan (In these tables, “disused volume” and “disposal volume” refer to the amount accumulated during the corresponding period, and “storage volume” shows the amount at of the end of the period).

Some high-voltage transformers and other devices are too large to move or transport. Their disposal may require dismantlement or removal of oils at places where they are stored or used. This may require technological development. “Disposal volume” below allows for such cases.

(1) High-voltage transformer and other devices

(As of 2002)

Fiscal year	Disused volume (units)	Disposal volume (units)	Storage volume (units)
Current March 2002	—	—	High-voltage transformer: 11,079 High-voltage condenser: 219,106 Other devices: 40,744
2002 to 2008	High-voltage transformer: 1,800 High-voltage condenser: 31,200 Other devices: 5,900	High-voltage transformer: 4,400 High-voltage condenser: 83,400 Other devices: 15,500	(March 2009) High-voltage transformer: 8,500 High-voltage condenser: 166,900 Other devices: 31,100
2009 to 2016	High-voltage transformer: 1,600 High-voltage condenser: 26,800 Other devices: 5,000	High-voltage transformer: 10,100 High-voltage condenser: 193,700 Other devices: 36,100	(July 2016) High-voltage transformer: 0 High-voltage condenser: 0 Other devices: 0

Note 1: “Disused volume” refers to the amount of wastes generated from electronic devices as they are used during the corresponding period.

Note 2: “Other devices” refers to any of low-voltage transformers, low-voltage condensers, reactors, discharge coils, surge absorbers, meter transformers, switches, breakers and rectifiers that are as large as a high-voltage transformer or high-voltage condenser.

Note 3: Figures are rounded to 100 units except for the storage volume in March 2002.

(2) Waste polychlorinated biphenyl（waste PCBs）and other wastes

(As of 2002)

Fiscal year	Disused volume (units)	Disposal volume (units)	Storage volume (units)
Current March 2002	—	—	Waste PCBs: 70 PCB-containing waste oils: 2,610
2002 to 2008	Waste PCBs: 0 PCB-containing waste oils: 0	Waste PCBs: 0 PCB-containing waste oils: 800	(March 2009) Waste PCBs:100 PCB-containing waste oils: 1,800
2009 to 2016	Waste PCBs: 0 PCB-containing waste oils: 0	Waste PCBs: 100 PCB-containing waste oils:1,800	(July 2016) Waste PCBs: 0 PCB-containing waste oils: 0

Note 1: Does not include waste oils containing PCBs derived from pole-mounted transformers.
Note 2: Figures are rounded to 100 t except for the current storage volume in March 2002.

(3) Pole-mounted transformer

(As of 2002)

Fiscal year	Disused volume (units)	Disposal volume (units)	Storage volume (units)
Current March 2002	—	—	Case:1,863,225 (Oil equivalent 178,320t)
2002 to 2008	Case: 1,072,000 (Oil equivalent: 61,000t)	Case: 1,228,000 (Oil equivalent: 143,000t)	(March 2009) Case: 1,702,000 (Oil equivalent: 95,000t)
2009 to 2016	Case: 880,000 (Oil equivalent: 38,000t)	Case: 2,582,000 (Oil equivalent: 133,000t)	(July 2016) Case: 0 (Oil equivalent: 0)

Note: Figures are rounded to 1,000 units or 1,000 t except for the current storage volume in March 2002.

Also, waste PCBs include insulation oil used in electronic devices and oil-filled cables that has been contaminated with small amounts of PCB, or electrical machinery coated with, soaked by, attached to insulation oil or that encloses it (hereafter referred to as electrical machinery contaminated by a small amount of PCB). For waste electrical machinery contaminated by small amounts of PCB, the prefectural governor issues a permit for disposal of industrial waste subject to special control and establishment of industrial waste disposal facilities in accordance with Article 14, 4 or Article 15 of the Wastes Disposal and Public Cleansing Act. Waste disposal systems will be improved by the Minister of the Environment recognizing detoxification in accordance with Article 14, 4, 4 of the act.

Section 6 Strategy for identification of stockpiles and wastes, and measures for sound management and disposal

When the chemicals designated under the Stockholm Convention were brought within the purview of the Chemical Substances Control Law and the Agricultural Chemicals Regulation Law, their stockpile and waste were specified by survey of actual conditions and guidance, and they were managed appropriately. In the future, if necessary, additional survey for the appropriate management and treatment will be conducted. The identification result, the situation of management and the treatment policy in the future are shown as follows.

1. Stored agricultural chemicals

In 1971, the distribution of certain organochlorinated agricultural chemicals was prohibited or restricted under a ministerial ordinance, because of their high persistence. As detoxification methods were not established at the time, they were stored in the ground in ways that they did not leach into surrounding areas.

Since the Stockholm Convention was ratified in 2001, the surveys were conducted to understand status of control and handling of these stored agricultural chemicals containing POPs (hereafter referred to as “stored agricultural chemicals”). The survey identified 168 sites nationwide and a total of approximately 4,400 tons that had been stored in the ground. Out of the total amount, approximately 4,000 tons had been excavated and handled properly by February, 2011 in accordance with the “Technical Documents on Treatment of Agricultural Chemicals containing POPs” developed by the Waste Management and Recycling Department, Ministry of the Environment.

Also, the environmental survey was conducted for the remaining approximately 400 tons of the stored agricultural chemicals in accordance with the Interim Manual for Survey and Excavation of Pesticides Stored in the Ground (Water Environment Department, Ministry of the Environment) to control them in ways that would not pollute the surrounding environment.

Results of survey of control status etc. of stored agricultural chemicals

(As of February, 2011) (In tons)

Prefecture	Status	Number of burial sites	Amount of stored agricultural chemicals	Amount of each stored agricultural chemical					
				BHC	DDT	Aldrin	Dieldrin	Endrin	Unknown
Hokkaido	Buried	2	566.020	232.995	303.039	2.794	0.672	26.520	
	Disposed	2	566.020	232.995	303.039	2.794	0.672	26.520	
Iwate	Buried	1	75.300	66.000	6.500	0.300			2.500

		Disposed	1	75.300	66.000	6.500	0.300			2.500
Miyagi		Buried	1	208.145	74.452	104.408	2.269	1.416	0.504	25.096
		Disposed	1	208.145	74.452	104.408	2.269	1.416	0.504	25.096
Akita		Buried	2	176.634	149.174					27.460
		Disposed	2	176.634	149.174					27.460
Yamagata		Buried	14	154.672	134.388	14.718	3.983	0.025	1.558	
		Disposed	14	154.672	134.388	14.718	3.983	0.025	1.558	
Fukushima		Buried	1	200.000	135.000	38.000	15.000			12.000
		Disposed	1	200.000	135.000	38.000	15.000			12.000
Ibaraki		Buried	1	65.600	55.800	7.900		1.900		
		Disposed	1	65.600	55.800	7.900		1.900		
Chiba		Buried	1	6.410	6.410					
		Disposed	1	6.410	6.410					
Kanagawa		Buried	2	73.000	30.000	17.500	11.000	13.500		1.000
		Disposed	2	73.000	30.000	17.500	11.000	13.500		1.000
Yamanashi		Buried	1	6.000						6.000
		Disposed	1	6.000						6.000
Nagano		Buried	10	376.169	1.000	0.250				374.919
		Disposed	9	367.169	1.000	0.250				365.919
Shizuoka		Buried	1	39.100	17.700	15.300	3.800			2.300
		Disposed	1	39.100	17.700	15.300	3.800			2.300
Niigata		Buried	85	492.708	364.261	86.834	5.144	1.026	0.163	35.281
		Disposed	12	287.861	187.636	71.951	1.097	0.017	0.038	27.122
Shiga		Buried	4	249.900	87.400	162.400				0.100
		Disposed	4	249.900	87.400	162.400				0.100
Wakayama		Buried	1	14.569	6.049	5.920				2.600
		Disposed	1	14.569	6.049	5.920				2.600
Tottori		Buried	19	153.414						153.414
		Disposed	1	10.665						10.665
Okayama		Buried	1	454.800	343.300	92.200				19.300
		Disposed	1	454.800	343.300	92.200				19.300
Yamaguchi		Buried	3	162.230	162.200					0.030
		Disposed	3	162.230	162.200					0.030
Ehime		Buried	1	226.271	191.998	33.569	0.242	0.250	0.212	
		Disposed	1	226.271	191.998	33.569	0.242	0.250	0.212	
Fukuoka		Buried	1	434.420						434.420
		Disposed	1	434.420						434.420
Saga		Buried	2	28.196	19.940	8.214			0.042	
		Disposed	2	28.196	19.940	8.214			0.042	
Kumamoto		Buried	2	119.900	58.949	0.604	23.766		0.065	36.516
		Disposed	2	119.900	58.949	0.604	23.766		0.065	36.516
Kagoshima		Buried	1	63.549	54.776	8.773				
		Disposed	1	63.549	54.776	8.773				
Okinawa		Buried	2	27.000	11.000	5.940	0.048		10.012	
		Disposed	2	27.000	11.000	5.940	0.048		10.012	
Total		Buried	159	4,374.007	2,202.792	912.069	68.346	18.789	39.076	1,132.936
		Disposed	67	4,017.411	2,026.167	897.186	64.299	17.780	38.951	973.028

2. Obsolete chlordanes

Chlordanes were designated as Class I specified chemical substances in 1986 under the Chemical Substances Evaluation Law. Currently the production, import and use of chlordanes is virtually prohibited.

According to surveys conducted in FY 2011, approximately 25 tons (equivalent to approximately 2 tons of chlordanes) of waste chlordane products, including insecticides for termite control, is in storage nationwide.

With respect to disposal of obsolete chlordanes, verification tests were conducted by business entities, and they had been properly disposed of by confirmed disposal methods.

3. Dioxin-contaminated wastes

The Waste Management Law and the Dioxins Law define wastes contaminated by dioxins and sources of emission as specially controlled municipal solid wastes or specially controlled industrial wastes ("specially controlled wastes")

The following table shows dioxin-contaminated wastes handled as specially controlled wastes:

Source of emission	Type of waste
Waste incinerators (firebed area of 0.5㎡ or more or processing capacity of 50 kg/hour or more)	Dust (3ng-TEQ/g or more) Burnt residue (3 ng-TEQ/g or more) Polluted sludge (3ng-TEQ/g or more)
Electric furnace for steelmaking	Dust (3ng-TEQ/g or more)
Roasting furnaces, melting furnaces and drying furnaces for aluminum alloys	
Bleaching facilities for sulfuric or hydrochloric acid pulps	Polluted sludge (3ng-TEQ/g or more) Waste acids (100pg-TEQ/L or more) Waste alkali (100pg-TEQ/L or more)
Acetylene cleaning equipment at acetylene production facilities using the carbide method	
Waste gas cleaning equipment at potassium sulfate production facilities	
Waste gas cleaning equipment at alumina fiber production facilities	
Dichloroethane cleaning equipment at vinyl chloride monomer production facilities	
Sulfuric acid concentration equipment, cyclohexane separation equipment and waste gas cleaning facilities at caprolactam production facilities	
Water-washing equipment and waste gas cleaning equipment at chlorobenzene/dichlorobenzene production facilities	
Water-washing equipment and waste gas cleaning equipment at sodium hydrogen 4-chlorophthalate production facilities	
Filtering equipment and waste gas cleaning equipment at 2,3-dichloro-1,4-naphthoquinone production facilities	
Nitrated derivative separation equipment, its cleaning equipment, deoxidation derivative separation equipment and its cleaning equipment at dioxazine violet production facilities	
Waste gas cleaning equipment on roasting furnaces, melting furnaces, drying furnaces for aluminum production and wet dust collectors	

Waste cleaning facilities and wet dust collectors at zinc recovery facilities for steelmaking electric furnace dust collectors	
Decomposition facilities, cleaning facilities and separation for waste PCBs	
Waste gas cleaning facilities of baking furnace used to manufacture supported catalysts	
For facilities used to collect metal from supported catalysts already used, filtering facilities, distillation facilities, waste gas cleaning facilities	
Facilities used to destroy fluorocarbons, plasma reaction facilities, waste gas cleaning facilities, and wet dust collection facilities	

The Pollutant Release and Transfer Register (PRTR) was set up in 2003 under the Chemical Substances Reporting and Management Promotion Law. In FY2009, 3,226 grams of dioxins were transferred or buried after being carried in wastes, such as particulates and burnt residue.

The amounts of dioxins transferred or buried have been confirmed since FY2001 under the Chemical Substances Reporting and Management Promotion Law. Dioxins statistics will also be collected annually in the future to accelerate disposal of dioxin-contaminated wastes.

The Waste Management Law sets standards on each process of storage, collection and transportation, and disposal of specially controlled wastes.

In storage, collection and transportation, dioxin-contaminated wastes must be separated from other wastes.

For reclamation or recycling, the law prescribes the dioxins concentration as follows:

- Dioxins contained in particulates, burnt residue or polluted sludge: 3 ng-TEQ/g or less.
- Dioxins contained in waste acids and waste alkalis: 100 pg-TEQ/L or less (for recycling only; burial not permitted).

After these treatments, waste can be landfilled as municipal or industrial wastes or recycled if their dioxins concentration meets the standard.

Furthermore, the government promotes the proper and rapid dismantlement of the disused waste incinerators, which do not meet the regulation for strengthened dioxins release, with government support intended for the dismantlement conducted along with facilities improvement at such sites.

4. Dioxin-containing agricultural chemicals

The Ministry of Agriculture, Forestry and Fisheries has directed the agricultural chemical manufacturers to collect from farmers and put under stringent control agricultural chemicals previously registered such as chloronitrophene (CNP), pentachlorophenol (PCP) and pentachloronitrophenol (PCNB), which were found to contain dioxins. These agricultural chemicals

have been stored at farmers together with ones at the stage of the manufacture and distribution.

Collected agricultural chemicals containing pentachlorophenol (PCP) and pentachloronitrophenol (PCNB) have been detoxified by the agricultural chemical manufacturers in accordance with the “Technical Documents on Treatment of Agricultural Chemicals containing POPs” developed by the Waste Management and Recycling Department, the Ministry of the Environment.

As for agricultural chemicals containing chloronitrophene (CNP), they have been kept under stringent control in ways that they would not pollute the surrounding environment. When detoxification becomes possible, they will be detoxified by the manufacturers in accordance with the “Technical Documents on Treatment of Agricultural Chemicals containing POPs” (developed by the Waste Management and Recycling Department, the Ministry of the Environment) and other relevant guidelines.

5. Industrial products containing PFOS or its salts

(1) Etching agent, photosensitive film of semiconductors, and photographic film for industrial use that contain or use in the manufacture PFOS or its salts

In Japan, PFOS or its salts were designated in 2010 as Class I Specified Chemical Substance under the Chemical Substances Control Law.

Therefore, currently, the manufacture, import and use of PFOS or its salts are virtually prohibited with the exceptions described as follows. The manufacture of the etching agent for the piezoelectric ceramic filter or composite semiconductor for high frequency band, the manufacture of the photosensitive film of semiconductors, and manufacture of photographic film for industrial use, as no alternatives exist and the uses would not threaten human health.

According to the survey conducted in FY2011, approximately 1.5 tons (approximately 30 kg in PFOS equivalent) of PFOS or its salts in stock were identified for use in the etching agent and photosensitive film of semiconductors.

For PFOS or its salts and products using PFOS or its salts, the technical standards and labeling matters at the time of transfer were established in accordance with the law to enable stringent control.

The “Technical Documents on Treatment of Wastes containing PFOS” was established, (Revised in September 2010 and March 2011), and proper disposal of these wastes will be promoted by relevant business entities.

(2) Foam extinguishing agents containing PFOS or its salts

For extinguishers, extinguishing agents for fire extinguishers and foam extinguishing agents that are produced using PFOS or its salts (hereafter referred to as foam extinguishing agents containing PFOS), alternative chemicals already exist, and it is unlikely that foam extinguishing agents containing PFOS will be manufactured/imported in the future. However, large amounts have already been distributed nationwide.

According to the survey conducted by the relevant ministry, a total of approximately 12 tons (amount of PFOS or its salts contained) of the foam extinguishing agents containing PFOS were identified.

Although it is desirable that the foam extinguishing agents containing PFOS will be replaced with alternative products immediately, it is quite difficult to replace them with alternatives in the short-term given large amounts have already been distributed nationwide. For this reason, the technical standards and labeling matters at the time of transfer were prepared to enable stringent control. Also, standards based on the Fire Defense Law have been revised to prevent leakage of the foam extinguishing agents containing PFOS to the exterior at the time of inspection of. fire defense equipment. Furthermore, status survey and awareness raising activities regarding stringent control are being promoted by the relevant ministry.

The “Technical Documents on Treatment of Wastes containing PFOS” was established, (Revised in September 2010 and March 2011), and proper disposal of these wastes will be promoted by relevant business entities.

Survey results about foam extinguishing agents containing PFOS etc.

Prefecture	Amount (In PFOS or its salts equivalent *) Unit: kg					
	Total	Fire-fighting organizations	Airport	Self-defense force facilities	Petrochemical complexes etc.	Others
Hokkaido	290.73	35.44	197.432	43.607	14.252	0
Aomori	107.707	8.63	0	99.076	0	0
Iwate	12.945	10.013	0	2.933	0	0
Miyagi	169.905	44.472	58.837	61.553	5.043	0
Akita	39.761	36.047	0	3.714	0	0
Yamagata	58.731	36.202	0	3.648	18.7	0.18
Fukushima	29.191	3.01	0	4.085	0.3	21.796
Ibaraki	224.84	47.473	0	102.568	2.23	72.57
Tochigi	18.022	0.016	0	2.322	0.03	15.655
Gunma	16.034	0	0	3.814	0	12.22
Saitama	215.06	55.583	0	60.868	11.3	98.409
Chiba	1227.986	735.406	0	19.198	233.3	240.082
Tokyo	1086.238	33.176	104.086	2.893	131.086	814.996
Kanagawa	1461.01	916.135	0	147.122	205.18	197.573
Niigata	409.161	289.254	35.911	9.811	26.881	47.304

Toyama	101.543	80.483	0	0.314	19.	1.746
Ishikawa	199.409	1.937	0	65.533	0.3	131.639
Fukui	4.194	3.758	0	0.367	0.054	0.015
Yamanashi	10.321	8.866	0	0.375	0	1.079
Nagano	63.308	62.863	0	0.445	0	0
Gifu	171.313	3.36	0	67.104	37.1	63.75
Shizuoka	221.3	97.345	0	89.676	34.16	0.119
Aichi	1899.049	393.21	0	25.81	58.345	1421.684
Mie	97.813	39.406	0	1.816	41.556	15.036
Shiga	9.188	1.394	0	3.867	0	3.928
Kyoto	55.102	0.119	0	29.834	1.026	24.124
Osaka	1266.529	299.932	102.968	0.995	792.051	70.583
Hyogo	123.827	75.349	0	3.256	31.361	13.861
Nara	7.644	4.84	0	1.039	0	1.766
Wakayama	30.223	18.599	0	1.423	10.201	0
Tottori	20.122	0.942	0	17.435	0	1.746
Shimane	18.774	0	0	3.387	0	15.387
Okayama	68.62	31.888	0	1.562	14.932	20.237
Hiroshima	193.659	32.218	33.038	11.19	37.89	79.324
Yamaguchi	79.748	24.616	0	50.167	0.039	4.926
Tokushima	18.731	0.502	0	18.229	0	0
Kagawa	138.272	55.952	34.031	0.69	47.6	0
Aichi	111.429	32.873	32.768	0.288	45.5	0
Kochi	74.297	0.851	73.289	0.157	0	0
Fukuoka	341.025	16.011	137.787	31.706	18.224	137.297
Saga	53.481	42.	0	8.471	8.72	0
Nagasaki	223.506	16.494	24.853	49.159	133.	0
Kumamoto	30.031	0	15.69	8.881	0	5.46
Oita	120.758	10.139	33.902	0.812	92.706	0
Miyagi	43.616	2.578	25.032	13.756	2.25	0
Kagoshima	149.21	10.406	49.469	86.839	16.	2.496
Okinawa	155.914	14.828	14.336	126.75	0	0
Total	11469.24	3634.613	973.428	1288.543	2090.317	3536.988

(Note)

Fire-fighting organizations : The Fire and Disaster Management Agency conducted the survey of every fire-fighting headquarters through the prefectures. As of the end of March, 2012.

Airports : The Ministry of Land, Infrastructure, Transport and Tourism conducted the survey of airports under state control in particular. As of the end of March, 2012.

Self-defense force facilities : The Ministry of Defense conducted the survey of the Self-Defense Forces camps, bases etc. As of the end of March, 2012.

Petrochemical complexes etc.: The Ministry of Economy, Trade and Industry conducted the survey of relevant companies through industrial groups. As of the end of July, 2012.

Other : The Ministry of the Environment conducted the survey to the extent possible with the help of the Japan Fire Extinguishing Systems Manufactures Association, General Incorporated Association. As of the end of July, 2012. It is difficult to identify all foam extinguishing agents containing PFOS or its salts under the control of private companies, and possibilities remain that the amounts change, depending on the survey to be continued in the future.

* In cases where types etc. of foam extinguishing agents are evident, conversion was conducted based on the concentration of PFOS or its salts contained in the foams. The average value of the concentration was employed and conversion conducted to the extent possible when types etc. are unclear.

6. Brominated flame retardants of plastics

In light of the actual status of the use of regulated chemicals, efforts will be made to check the current status at the stage of disposal and necessary measures considered.

Section 7 Strategy for Identification of contaminated sites

1. Dioxins

(1) Anti-pollution measures for soil

Dioxins have been under surveillance by local public authorities since FY2000 in accordance with the Dioxins Law. Surveys on dioxins in soil are categorized as follows according to the purpose to efficiently identify actual condition of contaminations.

(i) General environmental survey

To detect dioxins concentrations in soil in the general environment, this survey is conducted without presuming specific sources.

(ii) Survey on areas surrounding sources

This survey is conducted in areas surrounding sources to understand the effects of dioxins on soil around these sources.

(iii) Survey on designated areas

This survey is carried out to understand dioxins concentrations in soil in areas that are under threat of dioxins contamination (designated areas according to the result of existing surveys).

If soil is found with higher than a survey target level of 250 pg-TEQ/g in a general environment survey, soil surrounding the site is analyzed to identify dioxins concentration. If the site proves to exceed the environmental quality standard for soil of 1,000 pg-TEQ/g, a further survey is performed to determine the extent and depth of the contaminated soil.

When soil is confirmed to contain dioxins exceeding the environmental quality standard for soil, the site is designated by the local public authority as the controlled areas against soil contamination in accordance with the Dioxins Law. The local public authority then establish Plans of Measures and implements antipollution measures under Plans of Measures, including removal and detoxification of the soil.

By March 2011, five areas had been designated as controlled areas. Out of these areas, three areas had already been delisted, with necessary measures being implemented for the remaining two areas.

Verification surveys on and treatment of soil contaminated by dioxins require an enormous expense. Since it is necessary to reduce the costs, technological development and dissemination of its results are being addressed.

(2) Antipollution measures for bottom sediment

(i) Contamination survey on dioxins in bottom sediment

In response to the enforcement of the Dioxins Law in January 2000, an environmental standard regarding contamination of bottom sediment in public waters was set up in July 2002 and went into force in September.

In FY1999, local public authorities such as prefectures and municipalities nationwide carried out dioxins surveys on bottom sediment in public water bodies. Regular dioxins monitoring has been conducted since 2000.

Also after 1999, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has continually implemented dioxins surveys to analyze the contamination of water and bottom sediment in first-class rivers etc., and then compiled the manual for constant monitoring of dioxins in rivers and lakes etc. This manual describes the methods for constant monitoring, for example, the selection of survey areas, sampling sites, and the observation and measurement items. In FY2002, dioxin surveys were conducted on seaports being developed under government-sponsored projects, as well as on sea routes under governmental development and conservation. This aims to ensure safe, smooth implementation of dredging operations. Meanwhile, a survey was carried out in Tokyo Bay on POPs, including dioxins, in marine sediment as part of a marine reclamation project.

(ii) Basic concept for anti-pollution measures for dioxins in bottom sediment

Antipollution measures for dioxins in bottom sediment are urgently needed, because the dioxins surveys implemented so far on bottom sediment identified a number of areas where the dioxins concentration in bottom sediment fails to meet the environmental quality standard.

If bottom sediment is found contaminated beyond the environmental quality standard, some measures must be taken. In August 2002, the government issued the Guideline on Treatment and Disposal of Bottom Sediment. This guideline prescribes that, in taking disposal procedures such as removal of contaminated bottom sediment, consideration should be given on local characteristics such as the properties of the bottom sediment and the terrain, hydrographic conditions, flow conditions of the coastal region, as well as harvest seasons and fishing conditions. The guideline also requires appropriate management and retention of information regarding surveys and engineering works performed around the coastal region. Under this guideline it is also important to implement countermeasures against sources of emission in order to prevent the

progress of contamination.

(iii) Implementation of anti-pollution measures for dioxins in bottom sediment

(a) Rivers and lakes

To implement countermeasures against dioxins contamination in bottom sediment in rivers and lakes, the Ministry of Land, Infrastructure, Transport and Tourism has recently drafted an anti-dioxin manual for bottom sediment in rivers and lakes, in cooperation with academic experts. In line with this manual, the river administrators are implementing anti-pollution measures to cope with dioxins in bottom sediment in public water bodies.

The Ministry of Land, Infrastructure, Transport and Tourism is conducting studies and developing technology for decomposing and detoxifying dioxins in bottom sediment.

(b) Seaports

To implement necessary measures safely and consistently against dioxins found in seaports during dredging operation, the government compiled the Technical Guidelines on Anti-dioxin Measures for Bottom Sediment in March 2003 (revised in December 2003 and April 2008) and the Data Book on Dioxin Decomposition and Detoxification Technology for Bottom Sediment in Seaports in the March 2005 in cooperation with professional experts. These were distributed to concerned organizations.

Anti-dioxin measures for bottom sediment in seaports are promoted on the basis of the Technical Guidelines and the Data Book.

2. Polychlorinated biphenyl (PCB)

(1) Antipollution measures for soil

PCB is designated as a specified hazardous chemical under the Soil Contamination Countermeasures Law (Law No.53 of 2002). Surveys are to be conducted, for example, when facilities have been closed down that manufacture, use or dispose of PCB, and the character of land changes in ways that could lead to land contamination. In case that survey results show that standards stipulated under the law were not met, measures would be implemented including decontamination as necessary.

(2) Antipollution measures for bottom sediment

For PCB-contaminated bottom sediment, the provisional standard value for removal is set at 10 ppm per unit of dry weight of bottom sediment. If this value is exceeded, it is obligatory to implement certain measure to remove PCB.

A nationwide survey was conducted in FY1972 on PCB-contaminated bottom sediment. A total of 79 water areas were found to require antipollution measures, including removal of PCBs. In 78 of these areas, antipollution measures for PCB-contaminated bottom sediment was finished before the end of March 2003, and PCB removal was completed in November 2004 in the last one.

3. Others

The Waste Management Law and the Dioxins Law require that burnt residues and dusts containing dioxins be reclamated in landfills of managed type, while those of exceeding the standard must be taken to landfills of blocking type, in order to prevent environmental pollution.

In addition, sites where herbicides containing dioxins as contaminants, such as 2,4,5-T, were buried in an appropriate manner that prevents polluting, shall be kept being managed properly.

Section 8 Countermeasures against chemical substances not listed in the Annex of the Stockholm Convention

In Japan, some regulations have been imposed on industrial chemicals and agricultural chemicals that have certain characteristics such as toxicity and long-term persistency. New chemical substances are subject to prior evaluation before they are produced or imported. Production or import permission is issued only after the inspection above is conducted. Moreover, drugs etc. have been assessed before they are produced or on sale. If they are inadequate for drugs etc., production or sale permission is not issued.

Under the Chemical Substances Control Law, new industrial chemical substances are prior reviewed for degradability, accumulation, long-term toxicity on humans and toxicity to plants and animals. Evaluation of existing chemicals for their safety is also promoted. If a chemical is found to be highly persistent, accumulative and long-term toxic to humans or top predators, the chemical is designated as a Class I Specified Chemical Substance and is thus subject to a permission procedure for production and import. In addition, its use is restricted and subject to a notification procedure. Thus the production and import of such chemicals is virtually prohibited.

Under the Agricultural Chemicals Regulation Law, if agricultural chemicals meet the condition prescribed in each item of paragraph 1 of Article 3 relating to the adverse effect on human health and environment etc., registrations of those chemicals will be withheld. In addition, if a registered agricultural chemical was found to cause a damage under the condition met in item 2 to 7 of paragraph 1 of Article 3 (e.g. when agricultural chemicals may cause soil pollution and harm to human health/ livestock), the distribution shall be prohibited on the basis of the stipulation of Article 9.2 to prevent adverse effects on human health and environment. Moreover, the use of such

agricultural chemicals can also be prohibited following Article 11. At present, it is prohibited to distribute or use agricultural chemicals containing 27 chemicals as active ingredients, including the 14 chemicals designated under the Stockholm Convention and endosulfan.

Item 3, Paragraph 2, Article 14 of the Pharmaceutical Affairs Law (including cases where it shall read and apply pursuant to the provisions of the Article 83) stipulates that drugs etc. may be approved for marketing only after evaluation of their name, ingredients, composition, structure, dosage and administration, indications and usage, performance, side-effects etc,. based on the toxicity, absorption and metabolism of new substances. If they are inadequate for drugs etc., production or sale permission is not issued.

These laws will be applied to chemicals that have similar properties to those of POPs.

Section 9 Measures for monitoring POPs in the environment

(1) Summary of activities for environmental monitoring of POPs

The Ministry of the Environment has established an expert group to discuss measures to be taken for environmental monitoring of chemicals designated under the Stockholm Convention. The group deliberates on how to identify the state of environmental contamination and to evaluate the effects of measures currently being taken. It has set up a monitoring policy and monitoring method for POPs by high-resolution gas chromatography / high-resolution mass spectrometry. Under the improvement of the monitoring policy and the monitoring method, the government will continue to carry out nationwide surveys on water, bottom sediment, air and organisms for nineteen groups of POPs except dioxins and newly designated POPs. It will also carry out surveys of these chemicals in human biological samples (blood, cord blood, breast milk).

Regular-observation of PCBs in public waters by local public authorities will be reinforced in accordance with the Water Pollution Control Law.

Local public authorities implement large-scale nationwide surveys on dioxins under the Dioxins Law, which also requires constant monitoring, in public water, bottom sediment, ambient air and soil. The government will also continue to implement surveys on human biological samples.

A survey will be implemented to examine the distribution of land-derived POPs and their effects on the marine environment.

Moreover, the government will conduct environmental monitoring of the possible POPs chemicals.

More specifically, these surveys will be carried out as follows:

(2) Nineteen groups of chemicals other than dioxins and newly designated chemical substances

(i) Chemicals to be surveyed

- PCBs (total PCBs and each chemical containing up to 10 chlorides)
- DDTs (o,p'-DDT, p,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD and p,p'-DDD)
- Chlordanes (trans-chlordane, cis-chlordane, trans-nonachlor, cis-nonachlor and oxychlordane)
- Dieldrin, aldrin, endrin, mirex and toxaphenes
- HCB
- Heptachlors (Heptachlor, cis-heptachlor epoxide, trans-heptachlor epoxide)
- HCHs (α-HCH, β-HCH, γ-HCH, δ-HCH)
- Chlordecone
- Hexabromobiphenyls
- Polybromodiphenyl ethers (number of bromine: 4 to 10)
- PFOS or its salts, perfluorooctane sulfonyl fluoride (PFOSF)
- Pentachlorobenzene
- Endosulfan (entering into force on October 27, 2012)

(ii) Media and sites to be surveyed (Results of FY2010 survey)

- Water (49 sites, including major rivers, major lakes, seaports, .)
- Water (regular-observation sites in rivers, lakes, reservoirs and seas under the Water Pollution Control Law)
- Bottom sediment (64 sites, including major rivers, large lakes, seaports, etc.)
- Air（35 sites nationwide, each in 100-km^2 area）
- Organisms (26 sites on sea bass, greenling, rock greenling, Okinawa seabeam, dace, blue mussel, hard-shelled mussel, green mussel, gray starling, purplish bifurcate mussel, black-tailed gull, Pacific saury, chum salmon, and striped mullet)
- Human biological samples (blood, umbilical cord blood, breast milk)

(3) Dioxins

(i) Chemicals to be surveyed

PCDDs, PCDFs and coplanar PCBs

(ii) Media and sites to be surveyed (Results of FY2010 survey)

- Water (major rivers, major lakes, reservoirs, seaports; 1,610 sites）
- Bottom sediment (major rivers, major lakes, reservoirs, seaports; 1,328 sites)
- Air（general environment, areas surrounding sources of emission, roadsides; 691 sites）

・Soil（general environment, areas surrounding sources of emission; 998 sites）
・Groundwater（590 sites）
・Human biological samples (blood, breast milk, cord blood）

Section 10 International measures

1. Measures in responses to the Stockholm Convention

(1) Assistance to developing countries etc.

Developing countries in many cases have no institutional framework of regulatory measures against hazardous substances in place, thus resulting in environmental pollution and public health hazards. It is important that the capabilities of developing countries and countries with economies in transition to manage chemical substances should be enhanced in order to eliminate or reduce releases of POPs on a global scale. Under Paragraph 2 of Article 12 and Paragraph 2 of Article 13 of the Stockholm Convention, Japan, as a developed country party, is to provide financial and technical assistance to the parties to the convention which are developing countries and countries with economies in transition. Japan has cooperated actively with these arrangements, taking into account the concerns and needs of these countries in the area of finance and technology.

(i) Technical cooperation

Japan has provided technical cooperation to developing countries in the field of environment management technology for the chemical industry, technology for the analysis and risk assessment of the environmental load of chemical substances, technology for the microanalysis of chemical substances etc. by dispatching experts to and receiving trainees from these countries. In FY2005, the Chemical Substances Management Policy Training course was initiated. Japan keeps providing technical cooperation upon requests from other countries. Within the bilateral ODA projects for FY2010, training courses concerning management and reduction of chemical substances were carried out. Total 49 trainees participated and learned POPs measuring techniques and disposal techniques necessary to ensure food safety and security. Also, since FY2011, international training courses for capacity building in POPs management have been provided in cooperation with Brazil to 10 Latin American countries, to help them achieve the targets under the Stockholm Convention. Such cooperation will be continued upon requests from developing countries.

(ii) Financial assistance

The interim financial assistance arrangements under the Stockholm Convention are operated by the Global Environment Facility (GEF). GEF provides basically grants to developing countries and countries with economies in transition in order to cover their incremental costs in order to respond to global environmental issues. GEF has also been designated as their respective funding mechanisms in the multi-international environmental agreements including those on the reduction of the emission of green house gases, the protection of biodiversity, the conservation of the pollution of international waters and the protection of the ozone layer etc.

In the fifth replenishment of GEF, Japan has contributed 505 million dollars representing 14.3% of the Fund's total of 3.54 billion dollar on a pledging basis.

(iii) Regional arrangements

As a part of Japan's regional responses in the East Asia region, the Ministry of the Environment and the National Institute for Environmental Studies have held the East Asia POPs Monitoring Workshop beginning in FY2002 to build a monitoring framework, and to enable smooth and continuous data collection necessary for effectiveness evaluation under the Stockholm Convention for understanding correctly the trends of POPs in the environment in the East Asia region.

Results of the surveys conducted as part of the Japan's regional responses until 2006 in eight countries in East Asia region were compiled in the "Asia Pacific Monitoring Report (December 2008)" which were submitted to the Secretariat to contribute to the 1st effectiveness evaluation under the Stockholm Convention.

In the future, Japan, in cooperation with the countries in East Asia region etc., will conduct POPs Monitoring, providing technical assistance, and contribute to the evaluation of the effectiveness of the Stockholm Convention based on Article 16.

(2) Exchange of information

Japan exchanges information with other parties and the Secretariat of the Stockholm Convention through the Global Environment Division of the Ministry of Foreign Affairs.

2. Coordination with other related international conventions

In addition to the Stockholm Convention, the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal (hereafter referred to as the Basel Convention, Japan concluded in September 1993.) and the Rotterdam Convention on the Prior Informed Consent Procedures for Certain Hazardous Chemicals and Pesticides in

International Trade (hereafter referred to as the PIC Convention, Japan concluded in June 2004.) are also related to chemical substances management. Japan has been positively implementing these Conventions. Japan recognizes that the Stockholm Convention and these Conventions in the field of trade and the environment are mutually supportive.

The Basel Convention, which aims to regulate the transboundary movement and disposal of hazardous wastes, was adopted in March 1989 and entered into force in May 1992. Japan acceded to the Convention in September 1993 and the Convention came into effect in Japan in December 1993.

Paragraph 2 of Article 6 of the Stockholm Convention stipulates that the Conference of Parties to the Convention shall cooperate closely with appropriate bodies of the Basel Convention and Paragraph 1 (d) (iv) of Article 6 stipulates that wastes shall not be transported across international boundaries without taking into account relevant international rules, standards and guidelines. These rules include the regulations under the Basel Convention. The Basel Convention designates wastes containing POPs as specific hazardous wastes, and also requires their management in an environmentally sound manner. In Japan, the Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes (Law No. 108 of 1992. hereafter referred to as the Basel Law) and the Waste Management Law have being properly enforced to implement the regulation of import and export of hazardous wastes. It is required that wastes containing POPs designated as specific hazardous wastes under the Basel Law be properly managed from the perspective of the environment under the law. To publicize the scope of the Basel Convention and the regulations under the Basel Law for preventing illegal export of wastes, the government, in cooperation with Customs Offices, organizes briefing meetings on the Basel Law etc. across the country. The Ministry of the Environment and the Ministry of Economy, Trade and Industry conduct prior consultation services on matters relating to the export and import of hazardous wastes etc.

The PIC Convention, which provides the prior informed consent (PIC: Prior Informed Consent) procedure for certain hazardous chemical substances and pesticides in international trade, was adopted at the Diplomatic Conference held in September 1998, and Japan acceded to the Convention in June 2004 and the PIC Convention entered into force in September 2004.

Paragraph 2 (b) of Article 3 of the Stockholm Convention stipulates that when the POPs listed in Annex A and Annex B are to be exported in accordance with their specific exemption, any relevant provisions in existing international prior informed consent instruments should be taken into account. Therefore, parties are required to take into account the PIC system as set forth in the PIC Convention etc. when they are to export in exceptional circumstances the POPs referred to in that Article.

The government keeps implementing these Conventions related to chemical management

positively.

Also, at the “the Conferences of the Parties to the Basel, Rotterdam and Stockholm Conventions” held in March 2010, they agreed upon the establishment of a joint head of the secretariats of the Basel, Rotterdam and Stockholm Conventions with a view to enhancing cooperation and coordination (synergy) among the three Conventions. They also decided to use the regional centers that are being established under each Convention to promote cooperation and coordination among the three Conventions. Japan will be engaged properly in international activities to strengthen synergy among the three Conventions through collaboration among the ministries and agencies concerned.

Section 11 Provision of information

1. Compilation of information

The government has taken various measures for providing information on POPs. It has made efforts for raising awareness and promoting understanding of POPs issues through the provision of information on POPs such as homepage and pamphlets on POPs, as well as on dioxins and PCB (table below).

The government keeps providing the information on POPs positively.

Pamphlets and brochures	POPs - persistent organic pollutants -
	Dioxins 2012 (Japanese version)
	Dioxins 2009 (English version) Toward the Sound Disposal of Polychlorinated Biphenyls(PCB) Wastes
Homepages	POPs ・http://www.meti.go.jp/policy/chemical_management/int/pops.html ・http://www.env.go.jp/chemi/pops/treaty.html
	Chemical Substances Control Law ・http://www.mhlw.go.jp/new-info/kobetu/seikatu/kagaku/index.html ・http://www.meti.go.jp/policy/chemical_management/kasinhou/index.html http://www.meti.go.jp/policy/chemical_management/english/cscl/index.html ・http://www.env.go.jp/chemi/kagaku/index.html
	Measures against Dioxins (Japanese) ・http://www.env.go.jp/chemi/dioxin/index.html Measures against Dioxins(English) ・http://www.env.go.jp/en/topic/dioxins.html
	Polychlorinated Biphenyls Wastes ・http://www.env.go.jp/recycle/poly/index.html

2. Consultation with stakeholders

Paragraph 2 of Article 7 stipulates that the Parties shall, where appropriate, cooperate directly or through global, regional and subregional organizations, and consult their national stakeholders, including women's groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans.

After the Interim Guidance for Developing a National Implementation Plan was presented by the United Nations Environment Programme (UNEP) and World Bank at the sixth Inter-Governmental Negotiating Committee held in June 2002, the Ministry of the Environment organized meetings for the exchange of opinions with NGOs etc. Furthermore, in developing the national implementation plan, the government published it for public comments.

The government keeps facilitating the consultation with stakeholders.

3. Publicity activities

In addition to compilation and provision of information on POPs as explained in 3.11.1, the Ministries have taken actions such as press releases, taking advantage of occasions such as when the fifth Inter-Governmental Negotiating Committee agreed upon the draft Convention text, when the Diplomatic Conference adopted the Convention and when Japan acceded to the Convention, and wide distribution of pamphlets etc.

The government will provide the information on POPs on homepage and through pamphlets etc., and conduct press releases, in a timely manner.

Section 12 Promotion of research and technological development

1. Overall policy

The Science and Technology Basic Plan (decided by the Government of Japan in August, 2011) describing the basic policy for the promotion of science and technology for a period of 5 years from FY 2011 through FY2015, prescribes "it is important to promote activities regarding risk evaluation and risk management simultaneously, considering possible risks associated with science and technology" at each stage of basic studies, application, development, commercialization, and practical realization in making research and development efforts that Japan promotes intensively. It also promotes the safe and convenient livelihood as a top priority and prescribes "the promotion of studies regarding evaluation of hazardousness and risks of

environmental pollutants in air, water and soil, their management and control measures to achieve the protection of human health and ecosystem services", with a view to "achieving safe and secure society with a high quality of life for the people".

2. Individual research and technological development

Following comprehensive research and technological development shall be promoted in accordance with paragraph 1 (a) to (g) of Article 11, regarding (1) the behavior including the generating sources, monitoring, analytical techniques and modeling, (2) effects on human health, the environment and society, (3) technologies for release reduction and detoxification.

In promoting these researches, it is important to note that the results should be applicable to and effective for not only Japan but also the neighboring countries or developing countries, because POPs issues do not limited to Japan.

(1) The behavior including the generating sources, monitoring, analytical techniques and modeling

The development of multimedia models for POPs which take into account environmental factors peculiar to Japan and East Asia was developed.

Development of a simple and rapid method for the extraction of POPs in soils, method to predict residual concentrations in cucurbitaceous vegetable based on POPs concentrations in agricultural soils, and studies to ascertain physiological mechanism regarding absorption and transportation in various crop plants are being conducted.

Methods to enable sensitive detection of environmental POPs concentrations will be conducted as well.

For brominated dioxins, assessment of status of emissions from sources will be promoted.

(2) Effects on human health, the environment and society

With regard to degradability and accumulation to be evaluated, chemical substance specific prediction systems (enabling the estimation of propensity for degradability and accumulation) were developed by adopting evaluation methods using structure-activity relationship (SAR) and empirical rule based on chemical structure.

(3) Technologies for release reduction and detoxification

Basic studies are being carried out including chemical degradation technologies using iron, soil decontamination technologies using complex degrading bacteria and wood based carbonization material, search of degrading bacteria, soil washing utilizing high-absorbent plants,

and development of technologies to restrain absorption into plant crops through the application of absorption materials (activated carbon) to soils.

Chapter 4 Review and updating of the national implementation plan

The Inter-Ministerial General Directors' Meeting will review the national implementation plan, accommodating the periodic intervals of reporting the implementation status of the Convention decided by the Conference of the Parties at its first meeting. The Inter-Ministerial General Directors' Meeting will publish the outcomes for comments.

Furthermore, the Inter-Ministerial General Directors' Meeting will, if necessary, update the national implementation plan and submit it to the Conference of Parties, in case of the addition of the chemicals designated under the Stockholm Convention, the revision of related domestic plans and various changes in the environment and the economy etc.

Reference materials

1. Status of general environment (Tables and Figures)

2. Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan

1. Status of general environment (Tables and Figures)

Table 1: Status of monitoring of POPs (Wildlife/ Air)

		74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Wildlife	Dioxins												O	O	O	O	B1	B1	B1	B1	B1	B1	B1	B1	B1	O	O	O,E	O	O	O	O	O	O	O			
	PCBs					B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB	B1	B1			B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1,E		B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin/Endrin	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1					E				B2	B2	B2	B2	B2	B2	B2	B2	
	Dieldrin	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1,E		B1,E		B2	B2	B2	B2	B2	B2	B2	B2	
	DDTs	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Chlordanes									B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Heptachlors									B1																				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Toxaphenes																														B2	B2	B2	B2	B2	B2	B2	
	Mirex																														B2	B2	B2	B2	B2	B2	B2	
	HCHs	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Hexabromobiphenyls																B1																			B2	B2
	Polybromodiphenyl ethers (Br_4-Br_{10})														B1	B1														B2	B2					B2		B2
	Perfluorooctane sulfonic acid (PFOS)																														B2		B2				B2	B2
	Pentachlorobenzene		B1				B1	B1	B1	B1	B1	B1	B1	B1		B1		B1		B1		B1		B1			B1								B2			B2
	Chlordecone																																			B2		B2
Air	Dioxins													O	O	O	O	O	O	O	O	O	O	O	A	A	A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A
	PCBs																								B1		B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB																					B1				E	B1			B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin/Endrin																													B2	B2	B2	B2	B2	B2	B2	B2	
	Dieldrin																													B2	B2	B2	B2	B2	B2	B2	B2	
	DDTs																													B2	B2	B2	B2	B2	B2	B2	B2	B2
	Chlordanes													B1																B2	B2	B2	B2	B2	B2	B2	B2	B2
	Heptachlors													B1																B2	B2	B2	B2	B2	B2	B2	B2	B2
	Toxaphenes																														B2	B2	B2	B2	B2	B2	B2	
	Mirex																														B2	B2	B2	B2	B2	B2	B2	
	HCHs																														(B2)	(B2)	(B2)	(B2)	(B2)	(B2)	B2	B2
	Hexabromobiphenyls																B1															B2						B2
	Polybromodiphenyl ethers (Br_4-Br_{10})																												B1			B2				B2	B2
	Perfluorooctane sulfonic acid (PFOS)																															B2						B2
	Pentachlorobenzene																					B1					B1								B2		B2	B2
	Chlordecone																														B2							B2

B1: Survey on the actual condition of chemical substances in the environment (until FY2001); B2: Survey on the actual condition of chemical substances in the environment (after FY2002): D: Survey under the Law concerning Special Measures against Dioxins; E: Survey on the environmental endocrine disruption; A: The air pollutants monitoring; O: Other survey
(B2): HCHs in air between FY2003 and FY2008 were treated as missing data.

* Detail of the survey on the actual condition of chemical substances in the environment: Refer to Ministry of the Environment web site: http://www.env.go.jp/chemi/kurohon/index.html (Also refer to annual reports before FY1996)
* Details of the survey under the Law concerning Special Measures against Dioxins: Refer to Ministry of the Environment web site http://www.env.go.jp/chemi/dioxin/report.html (Only in Japanese)
* Details of the survey on the environmental endocrine disruptors: Refer to the working group materials on Ministry of the Environment web site http://www.env.go.jp/chemi/end/index.html (Only in Japanese)

Table 2: Status of monitoring of POPs (Water/ Sediment/ Soil)

		74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
Water	Dioxins																									O	O	D	D	D	D	D	D	D	D	D	D	D
	PCBs		W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	B1, E, W	B1,W	B2, W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin/Endrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2	
	Dieldrin	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Heptachlors									B1																				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Toxaphenes										B1																				B2	B2	B2	B2	B2	B2	B2		
	Mirex										B1																				B2	B2	B2	B2	B2	B2	B2		
	HCHs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Hexabromobiphenyls																B1														B2						B2	B2
	Polybromodiphenyl ethers (Br_4-Br_{10})				B1										B1	B1								B1						B2	B2	B2					B2	B2
	Perfluorooctane sulfonic acid (PFOS)						B1																							B2			B2				B2	B2
	Pentachlorobenzene		B1				B1																												B2			B2
	Chlordecone																																			B2		B2
Sediment	Dioxins												O	O	O	O	B1	B1	B1	B1	B1	B1	B1	B1	B1	O	O	D	D	D	D	D	D	D	D	D	D
	PCBs																							B1	B1			B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin/Endrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2	
	Dieldrin	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Heptachlors									B1																				B2	B2	B2	B2	B2	B2	B2	B2	B2
	Toxaphenes										B1																				B2	B2	B2	B2	B2	B2	B2		
	Mirex										B1																				B2	B2	B2	B2	B2	B2	B2		
	HCHs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Hexabromobiphenyls																B1														B2						B2	B2
	Polybromodiphenyl ethers (Br_4-Br_{10})				B1										B1	B1								B1						B2	B2	B2					B2	B2
	Perfluorooctane sulfonic acid (PFOS)																														B2		B2				B2	B2
	Pentachlorobenzene		B1				B1																												B2			B2
	Chlordecone																																			B2		B2
Soil	Dioxins																									O	O	D	D	D	D	D	D	D	D	D	D	D

B1: Survey on the actual condition of chemical substances in the environment (until FY2001); B2: Survey on the actual condition of chemical substances in the environment (after FY2002): D: Survey under the Law concerning Special Measures against Dioxins; E: Survey on the environmental endocrine disruption; W: Survey under the Water Pollution Control Law; O: Other survey

* Detail of the survey on the actual condition of chemical substances in the environment: Refer to Ministry of the Environment web site: http://www.env.go.jp/chemi/kurohon/index.html (Also refer to annual reports before FY1996)
* Details of the survey under the Law concerning Special Measures against Dioxins: Refer to Ministry of the Environment web site http://www.env.go.jp/chemi/dioxin/report.html (Only in Japanese)
* Details of the survey on the environmental endocrine disruptors: Refer to the working group materials on Ministry of the Environment web site http://www.env.go.jp/chemi/end/index.html (Only in Japanese)

Table 3: Latest analytical method and minimum detectable concentration for POPs

Compound	Wildlife	Air	Water	Sediment	Soil
Dioxins	–	HRGC/HRMS	GC/MS	GC/HRMS	GC/HRMS
PCBs	GC/HRMS (0.8 – 3 pg/g-wet)	GC/HRMS (0.01 – 0.9 pg/m^3)	GC/HRMS (0.09 – 8pg/L)	GC/HRMS (0.3 – 60 pg/g-dry)	–
HCB	GC/HRMS (2 pg/g-wet)	GC/HRMS (0.7 pg/m^3)	GC/HRMS (4pg/L)	GC/HRMS (1 pg/g-dry)	–
Drins	GC/HRMS (0.8 – 3 pg/g-wet)*	GC/HRMS (0.02 – 0.04 pg/m^3)*	GC/HRMS (0.2 – 0.3pg/L)*	GC/HRMS (0.2 – 0.6 pg/g-dry)*	–
DDTs	GC/HRMS (0.2 – 1 pg/g-wet)	GC/HRMS (0.01 – 0.21 pg/m^3)	GC/HRMS (0.08 – 0.8pg/L)	GC/HRMS (0.4 – 2 pg/g-dry)	–
Chlordanes	GC/HRMS (1 – 3 pg/g-wet)	GC/HRMS (0.01 – 0.4 pg/m^3)	GC/HRMS (0.3 – 4pg/L)	GC/HRMS (0.3 – 4 pg/g-dry)	–
Heptachlors	GC/HRMS (0.9 – 1 pg/g-wet)	GC/HRMS (0.01 – 0.06 pg/m^3)	GC/HRMS (0.2 – 0.7pg/L)	GC/HRMS (0.3 – 1 pg/g-dry)	–
Toxaphenes	GC/HRMS (3 – 20 pg/g-wet)*	GC/HRMS (0.09 – 0.6 pg/m^3)*	GC/MS-NCI (2 – 20pg/L)*	GC/MS-NCI (4 – 30 pg/g-dry)*	–
Mirex	GC/HRMS (0.8 pg/g-wet)*	GC/HRMS (0.006 pg/m^3)*	GC/HRMS (0.2pg/L)*	GC/HRMS (0.4 pg/g-dry)*	–
HCHs	GC/HRMS (1 pg/g-wet)	GC/HRMS (0.02 – 0.47 pg/m^3)	GC/HRMS (0.3 – 2pg/L)	GC/HRMS (0.5 – 0.8 pg/g-dry)	–
Hexabromobiphenyls	GC/HRMS (0.7 – 3 pg/g-wet)	GC/HRMS (0.1 pg/m^3)	GC/HRMS (1pg/L)	GC/HRMS (0.6 pg/g-dry)	–
Polybromodiphenyl ethers (Br_4–Br_{10})	GC/HRMS (3 – 97 pg/g-wet)	GC/HRMS (0.05 – 9.1 pg/m^3)	GC/HRMS (1 – 100pg/L)	GC/HRMS (2 – 80 pg/g-dry)	–
Perfluorooctane sulfonic acid (PFOS)	LC/MS/MS-SRM-ESI-negative (9.6 pg/g-wet)	LC/MS/MS-SRM-ESI-negative (0.1 pg/m^3)	LC/MS/MS-SRM-ESI- negative (20 pg/L)	LC/MS/MS-SRM-ESI- negative (2 pg/g-dry)	–
Pentachlorobenzene	GC/HRMS (0.7 pg/g-wet)	GC/HRMS (0.5 pg/m^3)	GC/HRMS (1 pg/L)	GC/HRMS (0. 3pg/g-dry)	–
Chlordecone	LC/MS/MS-SRM-ESI-negative(2.3 pg/g-wet)	GC/HRMS (0.02 pg/m^3)	LC/MS/MS-SRM-ESI- negative (0.04 pg/L)	LC/MS/MS-SRM-ESI- negative (0.2 pg/g-dry)	–

-: No survey in FY 2009 and FY 2010 *: No survey in FY 2010 (analytical method and minimum detectable concentration for FY 2009)

The nationwide monitoring of dioxins was started in 1985 with respect to bottom sediment and aquatic animals in the rivers, lakes, marshes and sea waters, and in 1986 with respect to the ambient air. In 1998, water and soil also became subject to nationwide monitoring of dioxins using HRGC/HRMS. A highly sensitive measurement method for PCB, HRGC/HRMS was introduced in 2000. Moreover, the government has carried out nationwide environmental monitoring of other POPs, changing the measurement method GC-ECD for GC/HRMS (high-resolution) on wildlife, and GC/MS for GC/HRMS (high-resolution) on water and bottom sediment. Besides above surveys, local national authorities have been monitoring PCB in rivers, lakes, marshes and sea waters as part of the regular-observation system under the Water Pollution Control Law.

Table 4: Number of survey sites for dioxins and their concentrations by fiscal year

Unit: Air pg-TEQ/m^3
Water pg-TEQ/L
Sediment pg-TEQ/g
Soil pg/TEQ/g

Environmental mediums		Type of survey or site category (water groups)		FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010	Environmental Quality Standards
Air		all sites	average	0.55	0.23	0.18	0.15	0.13	0.093	0.068	0.059	0.052	0.050	0.041	0.036	0.032	0.032	
			concentration range	0.010 -1.4	0.0 -0.96	0.0065 -1.1	0.0073 -1.0	0.0090 -1.7	0.0066 -0.84	0.0066 -0.72	0.0083 -0.55	0.0039 -0.61	0.0053 -0.40	0.0042 -0.58	0.0032 -0.26	0.0049 -0.37	0.0054 -0.32	
			(number of sites)	(68)	(458)	(463)	(920)	(979)	(966)	(913)	(892)	(825)	(763)	(740)	(721)	(712)	(691)	
		in general	average	0.55	0.23	0.18	0.14	0.14	0.093	0.064	0.058	0.051	0.051	0.041	0.035	0.031	0.031	0.6
			(number of sites)	(63)	(381)	(353)	(705)	(762)	(731)	(691)	(694)	(628)	(577)	(565)	(538)	(536)	(530)	
		vicinity of sources	average	0.58	0.20	0.18	0.15	0.13	0.092	0.078	0.063	0.055	0.050	0.040	0.041	0.035	0.036	
			(number of sites)	(2)	(61)	(96)	(189)	(190)	(206)	(188)	(161)	(165)	(158)	(148)	(156)	(147)	(133)	
		along roads	average	0.47	0.19	0.23	0.17	0.16	0.091	0.076	0.055	0.054	0.050	0.044	0.036	0.031	0.028	
			(number of sites)	(3)	(16)	(14)	(26)	(27)	(29)	(34)	(37)	(32)	(28)	(27)	(27)	(29)	(28)	
Public Water	water	all sites	average	-	0.50	0.24	0.31	0.25	0.24	0.24	0.22	0.21	0.21	0.21	0.20	0.19	0.19	
			concentration range	-	0.065 -13	0.054 -14	0.012 -48	0.0028 -27	0.010 -2.7	0.020 -11	0.0069 -4.6	0.0070 -5.6	0.014 -3.2	0.0097 -3.0	0.013 -3.0	0.011 -3.1	0.010 -2.1	
			(number of sites)	-	(204)	(568)	(2,116)	(2,213)	(2,207)	(2,126)	(2,057)	(1,912)	(1,870)	(1,818)	(1,700)	(1,617)	(1,610)	
		River	average	-	-	0.40	0.36	0.28	0.29	0.27	0.25	0.24	0.23	0.25	0.23	0.22	0.21	1
			(number of sites)	-	-	(186)	(1,612)	(1,674)	(1,663)	(1,615)	(1,591)	(1,464)	(1,454)	(1,408)	(1,319)	(1,223)	(1,244)	
		Lakes and Reservoirs	average	-	-	0.25	0.22	0.21	0.18	0.20	0.17	0.18	0.18	0.16	0.16	0.17	0.21	
			(number of sites)	-	-	(63)	(104)	(95)	(102)	(99)	(100)	(89)	(91)	(91)	(87)	(91)	(86)	
		Sea area	average	-	-	0.14	0.13	0.13	0.092	0.094	0.095	0.082	0.096	0.072	0.078	0.073	0.077	
			(number of sites)	-	-	(319)	(400)	(444)	(442)	(412)	(366)	(359)	(325)	(319)	(294)	(296)	(287)	
	Bottom Sediment	all sites	average	-	8.3	5.4	9.6	8.5	9.8	7.4	7.5	6.4	6.7	7.4	7.1	7.1	6.9	
			concentration range	-	0.10 -260	0.066 -230	0.0011 -1,400	0.012 -540	0.0087 -640	0.057 -420	0.050 -1300	0.045 -510	0.056 -750	0.044 -290	0.067 -540	0.059 -390	0.054 -320	
			(number of sites)	-	(205)	(542)	(1,836)	(1,813)	(1,784)	(1,825)	(1,740)	(1,623)	(1,548)	(1,505)	(1,384)	(1,316)	(1,328)	
		River	average	-	-	5.0	9.2	7.3	8.5	6.3	7.1	5.6	5.8	6.6	6.4	5.9	6.3	150
			(number of sites)	-	-	(171)	(1,367)	(1,360)	(1,338)	(1,377)	(1,336)	(1,241)	(1,191)	(1,152)	(1,060)	(1,001)	(1,011)	
		Lakes and Reservoirs	average	-	-	9.8	11	18	13	11	9.4	8.4	9.2	10	9.2	9.1	10	
			(number of sites)	-	-	(52)	(102)	(85)	(86)	(89)	(90)	(79)	(84)	(82)	(79)	(84)	(75)	
		Sea area	average	-	-	4.9	11	11	14	11	9.0	9.2	9.7	10	9.4	10	10	
			(number of sites)	-	-	(319)	(367)	(368)	(360)	(359)	(314)	(303)	(273)	(271)	(245)	(243)	(230)	
Ground Water			average	-	0.17	0.096	0.092	0.074	0.066	0.059	0.063	0.047	0.056	0.055	0.048	0.055	0.048	
			concentration range	-	0.046 -5.5	0.062 -0.55	0.00081 -0.89	0.00020 -0.92	0.011 -2.0	0.00032 -0.67	0.0079 -3.2	0.0088 -0.72	0.013 -2.2	0.0076 -2.4	0.010 -0.38	0.011 -0.88	0.0098 -0.44	1
			(number of sites)	-	(188)	(296)	(1,479)	(1,473)	(1,310)	(1,200)	(1,101)	(922)	(878)	(759)	(634)	(608)	(590)	
Soil		Total	average	-	6.5	-	6.9	6.2	3.8	4.4	3.1	5.9	2.6	3.1	3.1	2.5	3.0	
			concentration range	-	0.0015 -61	-	0 -1,200	0 -4,600	0-250	0 -1,400	0-250	0 -2,800	0-330	0-170	0-190	0-85	0-94	
			(number of sites)	-	(286)	-	(3,031)	(3,735)	(3,300)	(3,059)	(2,618)	(1,782)	(1,505)	(1,285)	(1,073)	(976)	(998)	
		in general	average	-	-	-	4.6	3.2	3.4	2.6	2.2	2.0	1.9	2.7	2.8	2.1	2.1	1,000
			(number of sites)	-	-	-	(1,942)	(2,313)	(2,282)	(2,128)	(1,983)	(1,314)	(1,159)	(991)	(831)	(717)	(714)	
		vicinity of sources	average	-	-	-	11	11	4.7	8.4	6.0	17	5.0	4.3	4.1	3.5	5.4	
			(number of sites)	-	-	-	(1,089)	(1,422)	(1,018)	(931)	(635)	(468)	(346)	(294)	(242)	(259)	(284)	

(Air)

Note 1: From FY1997 to FY 1999, the data is the result of air environmental monitor investigation, executed by the governments under the Air Pollution Control Law (The investigation result of old Environment Agency is included).

Note 2: It limits to the sites evaluating the annual average with environmental quality standards.

Note 3: For the calculation of toxicity equivalent, I-TEF(1988), WHO-TEF (1998) and WHO-TEF (2006) have been used before FY 1998, from FY 1999 to FY 2007, and after FY 2008, respectively.

Note 4: As a rule, before FY 1998, when the concentration measurement of each isomer is less than minimum limit of determination, the toxicity equivalent has been calculated as zero.

After FY 1999, when the concentration measurement of each isomer is less than minimum limit of determination and it is

more than the detection lower bound, toxicity equivalent is calculated as it is. When it is less than the detection lower bound, the toxicity equivalent has been calculated by using the value of 1/2 of the detection lower bound for each isomer.

(Water quality of public waters and groundwater)

Note 1: WHO-TEF(1998) has been used for the calculation of toxicity equivalent before FY 2007, and WHO-TEF (2006) has been used after FY 2008.

Note 2: When the concentration measurement of each isomer is less than minimum limit of determination and it is more than the detection lower bound, toxicity equivalent is calculated as it is. When it is less than the detection lower bound, the toxicity equivalent has been calculated by using the value of 1/2 of the detection lower bound for each isomer.

(Soil)

Note 1: WHO-TEF(1998) has been used for the calculation of toxicity equivalent before FY 2007, and WHO-TEF (2006) has been used after FY 2008.

Note 2: When the concentration measurement of each isomer is less than minimum limit of determination, the toxicity equivalent has been calculated as zero.

Note 3: After FY 2009, results of sites using simplified assay are not included in the table above, by reason that the results can not be used for calculation of average, concentration range, etc.

Note4: The survey has been conducting according to the annual plan by the local governments. Number of survey sites for each year is not same.

Table 5: PCBs measurement under FY 2010 constant quality monitoring of public waters

	River		Lakes and Marshes		Sea waters		All sites		
	a: number of location exceeding environmental quality standards	b: number of location surveyed	a: number of location exceeding environmental quality standards	b: number of location surveyed	a: number of location exceeding environmental quality standards	b: number of location surveyed	a: number of location exceeding environmental quality standards	b: number of location surveyed	a/b (%)
PCB	0	1,850	0	149	0	449	0	2,448	0

Table 6: Concentration distributions of PCBs in water (FY 2010)

Local communities	Monitored sites	concentrations (pg/L)
Hokkaido	Suzuran-ohashi Bridge, Riv. Tokachi	140
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari	160
Aomori Pref.	Lake Jusan	51
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	nd
Miyagi Pref.	Sendai Bay	nd
Akita Pref.	Lake Hachiro	99
Yamagata Pref.	Mouth of Riv. Mogami	48
Fukushima Pref.	Onahama Port	230
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone	97
Tochigi Pref.	Riv. Tagawa	74
Saitama Pref.	Akigaseshusui of Riv. Arakawa	74
Chiba City	Mouth of Riv. Hanami	220
Tokyo Met.	Mouth of Riv. Arakawa	770
	Mouth of Riv. Sumida	2,100
Yokohama City	Yokohama Port	450
Kawasaki City	Keihin Canal, Port of Kawasaki	1,000
Niigata Pref.	Lower Riv. Shinano	170
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	44
Ishikawa Pref.	Mouth of Riv. Sai	950
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	2,200
Nagano Pref.	Lake Suwa (center)	69
Shizuoka Pref.	Riv. Tenryu	51
Aichi Pref.	Nagoya Port	470
Mie Pref.	Yokkaichi Port	210

Local communities	Monitored sites	concentrations (pg/L)
Shiga Pref.	Lake Biwa(center, offshore of Karasaki)	51
Kyoto Pref.	Miyazu Port	nd
Kyoto City	Miyamae Bridge, Riv. Katsura	610
Osaka Pref.	Mouth of Riv. Yamato	640
Osaka City	Osaka Port	1,900
Hyogo Pref.	Offshore of Himeji	160
Kobe City	Kobe Port (center)	820
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	140
Okayama Pref.	Offshore of Mizushima	41
Hiroshima Pref.	Kure Port	290
	Hiroshima Bay	110
Yamaguchi Pref.	Tokuyama Bay	50
	Offshore of Ube	41
	Offshore of Hagi	nd
Tokushima Pref.	Mouth of Riv. Yoshino	34
Kagawa Pref.	Takamatsu Port	470
Kochi Pref.	Mouth of Riv. Shimanto	nd
Kitakyushu City	Dokai Bay	1,400
Saga Pref.	Imari Bay	34
Nagasaki Pref.	Omura Bay	nd
Kumamoto Pref.	Riv. Midori	49
Miyazaki Pref.	Mouth of Riv. Oyodo	nd
Kagoshima Pref.	Riv. Amori	nd
	Gotanda-bashi Bridge, Riv. Gotanda	78
Okinawa Pref.	Naha Port	290

Table 7: Concentration distributions of PCBs in sediment (FY 2010)

Local communities	Monitored sites	concentrations (pg/g-dry)
Hokkaido	Onnenai-ohashi Bridge, Riv. Teshio	1,200
	Suzuran-ohashi Bridge, Riv. Tokachi	nd
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari	1,200
	Tomakomai Port	7,800
Aomori Pref.	Lake Jusan	2,500
Iwate Pref.	Riv. Toyosawa(Hanamaki City)	nd
Miyagi Pref.	Sendai Bay	4,600
Sendai City	Hirose-ohashi Bridge, Riv. Hirose	nd
Akita Pref.	Lake Hachiro	600
Yamagata Pref.	Mouth of Riv. Mogami	1,400
Fukushima Pref.	Onahama Port	38,000
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone	2,500
Tochigi Pref.	Riv. Tagawa	1,500
Chiba Pref.	Coast of Ichihara and Anegasaki	24,000
Chiba City	Mouth of Riv. Hanami	17,000
Tokyo Met.	Mouth of Riv. Arakawa	91,000
	Mouth of Riv. Sumida	350,000
Yokohama City	Yokohama Port	160,000
Kawasaki City	Mouth of Riv. Tama	49,000
	Keihin Canal, Port of Kawasaki	250,000
Niigata Pref.	Lower Riv. Shinano	450
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	1,500
Ishikawa Pref.	Mouth of Riv. Sai	13,000
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	490
Yamanashi Pref.	Senshu-bashi Bridge, Riv. Arakawa	nd
Nagano Pref.	Lake Suwa (center)	9,000
Shizuoka Pref.	Shimizu Port	11,000
	Riv. Tenryu	1,000

Local communities	Monitored sites	concentrations (pg/g-dry)
Aichi Pref.	Kinuura Port	8,900
	Nagoya Port	18,000
Mie Pref.	Yokkaichi Port	78,000
	Toba Port	90,000
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)	11,000
	Lake Biwa(center, offshore of Karasaki)	13,000
Kyoto Pref.	Miyazu Port	1,700
Kyoto City	Miyamae Bridge, Riv. Katsura	17,000
Osaka Pref.	Mouth of Riv. Yamato	20,000
Osaka City	Osaka Port	710,000
	Outside Osaka Port	180,000
	Mouth of Riv. Yodo	76,000
	Riv. Yodo	52,000
Hyogo Pref.	Offshore of Himeji	19,000
Kobe City	Kobe Port (center)	210,000
Nara Pref.	Riv. Yamato	790
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	8,200
Okayama Pref.	Offshore of Mizushima	5,000
Hiroshima Pref.	Kure Port	160,000
	Hiroshima Bay	24,000
Yamaguchi Pref.	Tokuyama Bay	5,000
	Offshore of Ube	3,700
	Offshore of Hagi	3,200
Tokushima Pref.	Mouth of Riv. Yoshino	nd
Kagawa Pref.	Takamatsu Port	38,000
Ehime Pref.	Niihama Port	6,500
Kochi Pref.	Mouth of Riv. Shimanto	1,100
Kitakyushu City	Dokai Bay	260,000
Fukuoka City	Hakata Bay	7,800
Saga Pref.	Imari Bay	5,600
Nagasaki Pref.	Omura Bay	7,000
Oita Pref.	Mouth of Riv. Oita	1,400
Miyazaki Pref.	Mouth of Riv. Oyodo	nd
Kagogshima Pref.	Riv. Amori	nd
	Gotanda-bashi Bridge, Riv. Gotanda	nd
Okinawa Pref.	Naha Port	93,000

Table 8: Concentration distributions of Chlordanes in fish (FY 2010)

Local communities	Monitored sites	Wildlife species	Concentration (pg/g-wet)
Hokkaido	Offshore of Kushiro	Rock greenling	230
	Offshore of Kushiro	Chum salmon	820
	Offshore of Japan Sea (offshore of Iwanai)	Greenling	1,400
Iwate Pref.	Yamada Bay	Greenling	340
Miyagi Pref.	Sendai Bay	Sea bass	300
Ibaraki Pref.	Offshore of Joban	Pacific saury	1,700
Tokyo Met.	Tokyo Bay	Sea bass	5,900
Kawasaki City	Offshore of Ogishima Island, Port of Kawasaki	Sea bass	3,300
Nagoya City	Nagoya Port	Striped mullet	6,400
Shiga Pref.	Lake Biwa, Riv. Azumi	Dace	10,000
Osaka Pref.	Osaka Bay	Sea bass	7,800
Hyogo Pref.	Offshore of Himeji	Sea bass	11,000
Tottori Pref.	Nakaumi	Sea bass	820
Hiroshima City	Hiroshima Bay	Sea bass	2,600
Kochi Pref.	Mouth of Riv. Shimanto	Sea bass	610
Oita Pref.	Mouth of Riv. Oita	Sea bass	5,900
Kagoshima Pref.	West Coast of Satsuma Peninsula	Sea bass	450
Okinawa Pref.	Nakagusuku Bay	Okinawa seabeam	5,800

Table 9: Concentration distributions of Chlordanes in sediment (FY 2010)

Local communities	Monitored sites	concentrations (pg/g-dry)
Hokkaido	Onnenai-ohashi Bridge, Riv. Teshio	160
	Suzuran-ohashi Bridge, Riv. Tokachi	37
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari	570
	Tomakomai Port	88
Aomori Pref.	Lake Jusan	130
Iwate Pref.	Riv. Toyosawa(Hanamaki City)	18
Miyagi Pref.	Sendai Bay	60
Sendai City	Hirose-ohashi Bridge, Riv. Hirose	64
Akita Pref.	Lake Hachiro	29
Yamagata Pref.	Mouth of Riv. Mogami	270
Fukushima Pref.	Onahama Port	1,200
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone	370
Tochigi Pref.	Riv. Tagawa	190
Chiba Pref.	Coast of Ichihara and Anegasaki	630
Chiba City	Mouth of Riv. Hanami	8,800
Tokyo Met.	Mouth of Riv. Arakawa	4,900
	Mouth of Riv. Sumida	9,500
Yokohama City	Yokohama Port	1,200
Kawasaki City	Mouth of Riv. Tama	2,600
	Keihin Canal, Port of Kawasaki	1,000
Niigata Pref.	Lower Riv. Shinano	74
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	250
Ishikawa Pref.	Mouth of Riv. Sai	2,200
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	22
Yamanashi Pref.	Senshu-bashi Bridge, Riv. Arakawa	170
Nagano Pref.	Lake Suwa (center)	920
Shizuoka Pref.	Shimizu Port	140
	Riv. Tenryu	240

Local communities	Monitored sites	concentrations (pg/g-dry)
Aichi Pref.	Kinuura Port	150
	Nagoya Port	200
Mie Pref.	Yokkaichi Port	210
	Toba Port	130
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)	1,700
	Lake Biwa(center, offshore of Karasaki)	320
Kyoto Pref.	Miyazu Port	27
Kyoto City	Miyamae Bridge, Riv. Katsura	370
Osaka Pref.	Mouth of Riv. Yamato	9,300
Osaka City	Osaka Port	3,400
	Outside Osaka Port	250
	Mouth of Riv. Yodo	6,100
	Riv. Yodo	7,700
Hyogo Pref.	Offshore of Himeji	250
Kobe City	Kobe Port (center)	480
Nara Pref.	Riv. Yamato	590
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	980
Okayama Pref.	Offshore of Mizushima	38
Hiroshima Pref.	Kure Port	770
	Hiroshima Bay	320
Yamaguchi Pref.	Tokuyama Bay	120
	Offshore of Ube	96
	Offshore of Hagi	15
Tokushima Pref.	Mouth of Riv. Yoshino	14
Kagawa Pref.	Takamatsu Port	7,800
Ehime Pref.	Niihama Port	84
Kochi Pref.	Mouth of Riv. Shimanto	250
Kitakyushu City	Dokai Bay	780
Fukuoka City	Hakata Bay	230
Saga Pref.	Imari Bay	120
Nagasaki Pref.	Omura Bay	130
Oita Pref.	Mouth of Riv. Oita	330
Miyazaki Pref.	Mouth of Riv. Oyodo	30
Kagogshima Pref.	Riv. Amori	32
	Gotanda-bashi Bridge, Riv. Gotanda	270
Okinawa Pref.	Naha Port	25,000

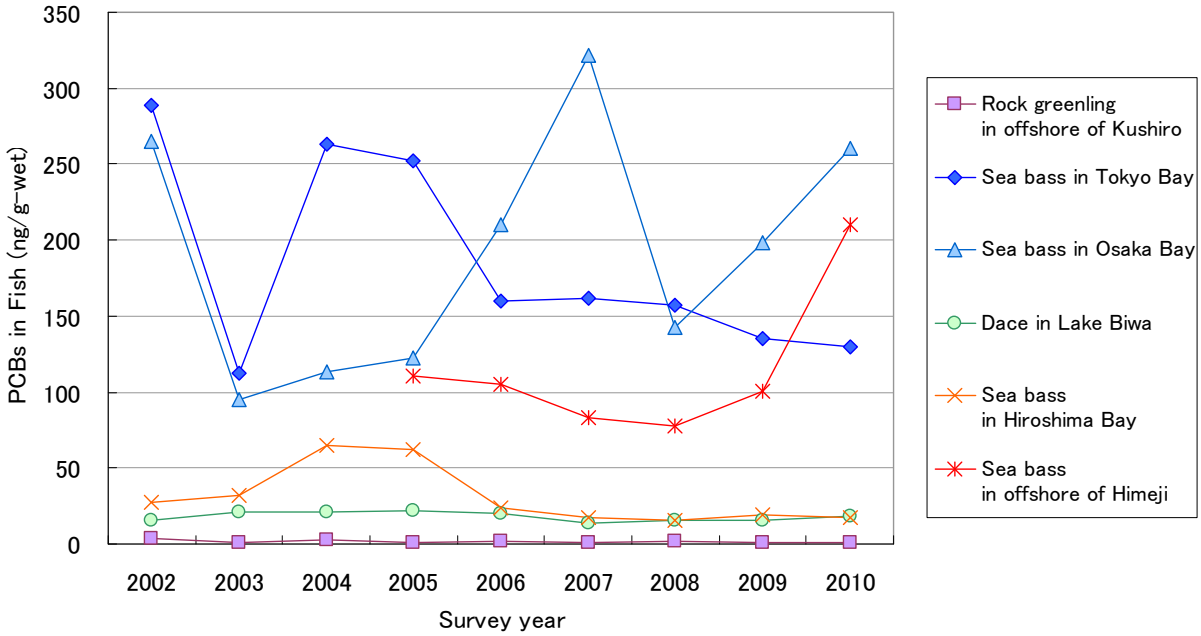


Figure 1: Annual changes in PCBs concentration in fish

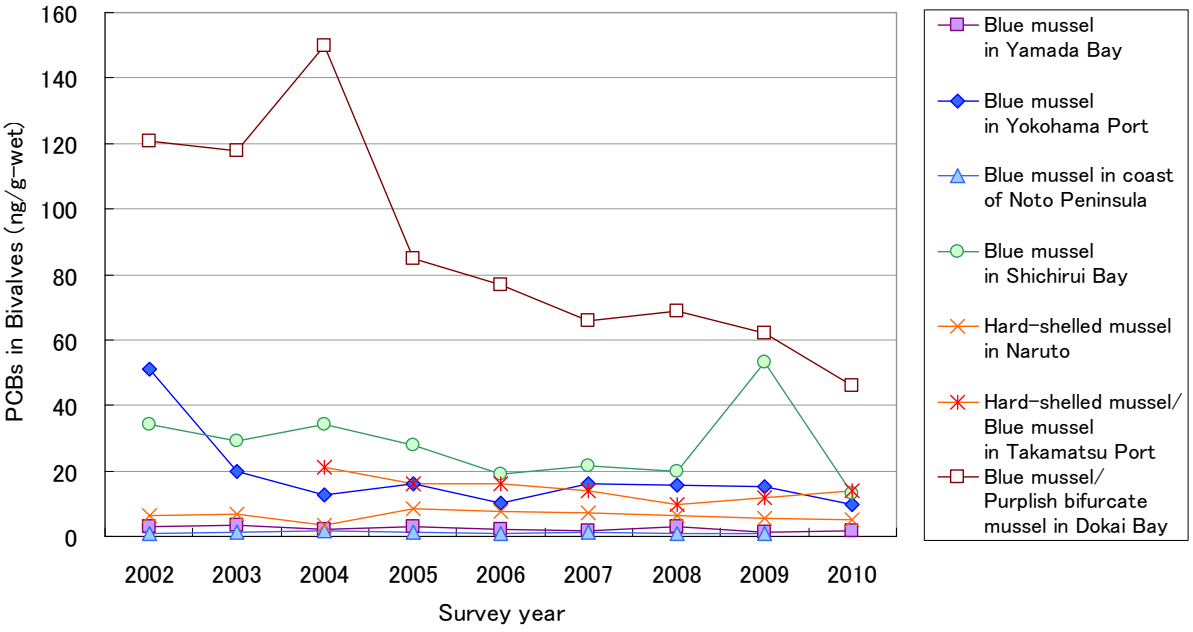
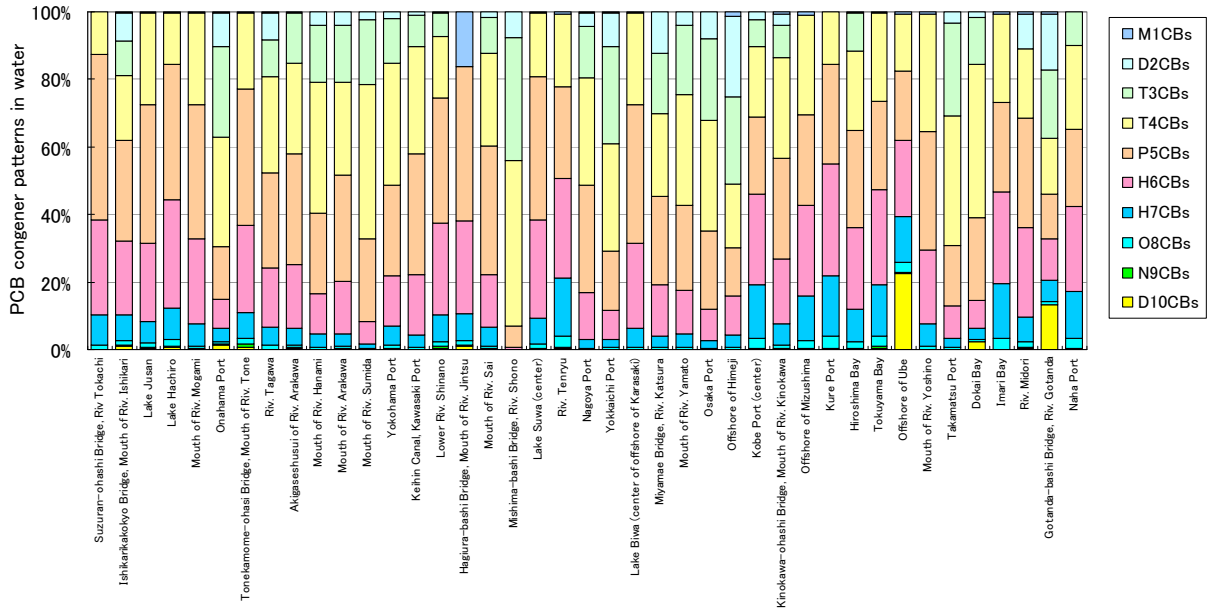


Figure 2: Annual changes in PCBs concentration in bivalves



(* Only include data which total concentration is above minimum limit of determination (nd))

Figure 3: Ratio by site of analogues in PCBs concentration in water (FY 2010)

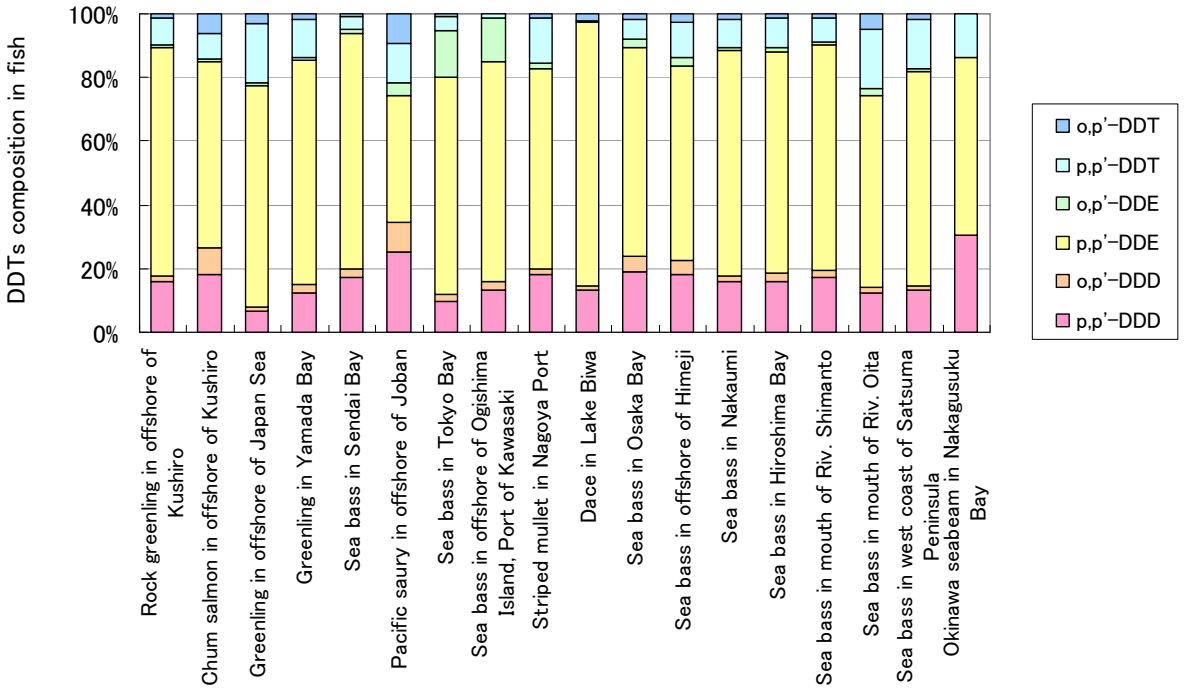


Figure 4: DDTs composition in fish (FY 2010)

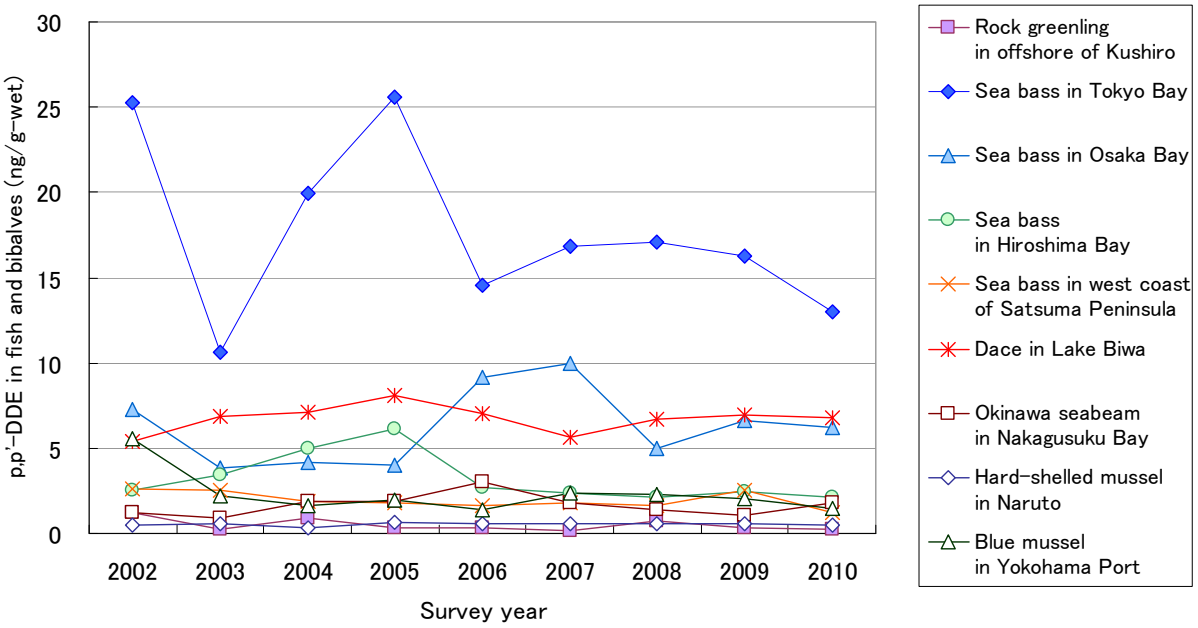


Figure 5: Annual changes in p,p'-DDE concentration in fish and bivalves

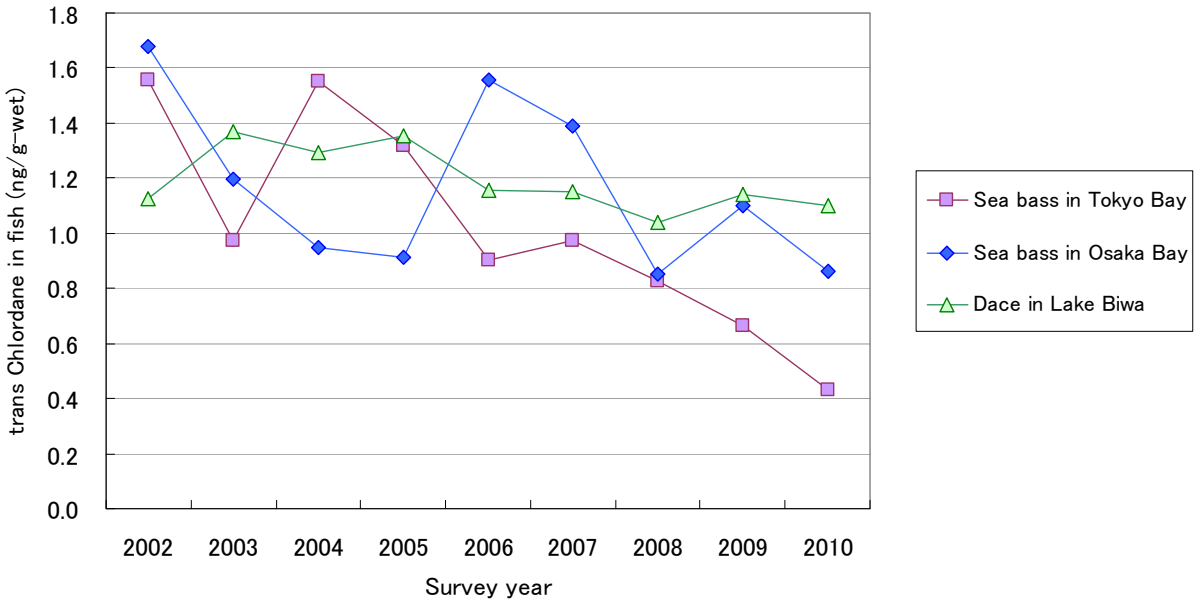


Figure 6: Annual changes in trans-Chlordane concentration in fish

2. Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan

(Modified in August 2012)

Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan (Modified)

Pursuant to Paragraph 4 of Article 33 of the Law Concerning Special Measures against Dioxins (Law No.105 of 1999) as correspondingly applied Paragraph 5, the government publishes the Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan, modified as follows according to Paragraph 1 of Article 33:

Section 1 Reduction targets relating to the estimated amount of dioxins emissions categorized by field of business activities in Japan

In view of environmental improvements in recent years, reduction targets of the estimated amounts of dioxins emissions, categorized by fields of business activities in Japan, shall be as follows for the time being, on the assumption that continuous efforts will be made to reduce emissions to the extent possible, with the principle that the improved environment will not be exacerbated.

Also, the degree of the accomplishment of the reduction targets shall be evaluated every 5 years, together with the review of the action plan under Article 5 of the Stockholm Convention on Persistent Organic Pollutants (hereafter referred to as “Stockholm Convention”).

Field of business activities	Reduction targets (g-TEQ/year)	(Reference) Reduction targets in the previous plans (g-TEQ/year)		(Reference) Estimated amounts of dioxins emissions (g-TEQ/year)		
		Reduction targets (as of 2003)	Reduction targets (as of 2010)	1997	2003	2010
1 Fields of waste disposal	106	576~622	164~189	7,205~7,658	219~244	94~95
(1) Municipal waste incinerators	33	310	51	5000	71	33
(2) Industrial waste incinerators	35	200	50	1505	75	29
(3) Small-scale waste incinerators (subject to laws)	22	66~122	63~88	700~1,153	73~98	19
(4) Small-scale waste incinerators (exempt from laws)	16					13~14
2 Fields of industry	70	264	146	470	149	61
(1) Electric steel-making furnaces	31.1	130.3	80.3	229	80.3	30.1
(2) Sintering facilities for steel industry	15.2	93.2	35.7	135	35.7	10.9

(3) Facilities for recovering zinc (Roasting furnaces, Sintering furnaces, Blast furnaces, Melting furnaces and Drying furnaces)	3.2	13.8	5.5	47.4	5.5	2.3
(4) Facilities for manufacturing aluminum base alloy (Roasting furnaces, Melting furnaces and dry kilns)	10.9	11.8	14.3	31.0	17.4	8.7
(5) Other facilities	9.8	15	10.4	27.3	10.3	8.8
3 Others	0.2	3~5	4.4~7.7	1.2	0.6	0.2
Total	176	843~891	315~343	7,676~8,129	368~393	155~156

Note 1: Reduction targets represent annual amounts of dioxins emissions after measures to reduce dioxins in emission gas and effluent water have been taken.

Note 2: Ranges in the columns result from different estimation methods.

Note 3: The same reduction target was established for the small-scale waste incinerators subject to laws and those exempt from laws in the previous plans. For this plan, the different targets are established.

Note 4: In the fields of industry, the two different reduction targets were established in the previous plans for the facilities for recovering copper and the pulping process with bleaching. For this plan, they are integrated into "(5) Other facilities", as only tiny amounts of emissions were detected.

Note 5: "3 Others" is sewage disposal facilities and waste disposal sites. While crematoria, cigarette smoke, and exhaust emissions from motor vehicles were included in "3 Others" in the previous plans, they are not covered in this plan (For this reason, their previous estimated amounts of emissions are not counted in).

Remark: Unit "g-TEQ/year" is used to represent annual emissions of dioxins in terms of the toxic equivalent quantity (TEQ), which sums up toxicities of dioxin congeners, in relation to the toxic equivalency factor (the factor representing the toxicity of a dioxin congener relative to the toxicity of 2,3,7,8-TeCDD, which is the most toxic among dioxins). "WHO-TEF (1998)" means the TEF published by WHO in 1998.
WHO- TEF (1998) is used as the toxic equivalence factor for the calculation of emissions from 1997 to 2003 and the reduction targets in the previous plans. For emissions in 2010 and the reduction targets in this plan, WHO-TEF (2006) is used to the extent possible.

Section 2 Measures for businesses in order to achieve reduction targets

1. Compliance with emission standards, etc.

(1) Compliance with the emission standard for the emission gas and effluent standard for the effluent water etc.

Pursuant to Article 20 of the Law Concerning Special Measures against Dioxins (Law No.105 of 1999, hereinafter referred to as "the Dioxins Law"), businesses shall not release emission or effluent whose level of dioxins contained complies with emission standards, at the outlets of emission of a facility subject to

emission standard and at the drainage outlets of a facility which is installed in a site subject to effluent standard.

Also, in cases that the total mass emission control standard is established pursuant to Article 10 of the Dioxins Law, businesses must comply with the standard.

(2) Prevention of environmental pollution by dioxins

Pursuant to Article 4 of the Dioxins Law, businesses shall take the necessary measures for the prevention of environmental pollution by dioxins resulting from their business activities including the prevention of accidents that may cause dioxins emissions. Businesses shall also cooperate any measures implemented by the national government or local public authorities with regard to the prevention, etc. of environmental pollution by dioxins.

The above-mentioned measures by the national government include the development and implementation of the Action Plan under Article 5 of the Stockholm Convention on Persistent Organic Pollutants (hereinafter referred as to “Stockholm Convention”) and the promotion of the use of best available techniques (BAT) and best environmental practices (BEP).

(3) Measures in case of accidents

As provided in Article 23 of the Dioxins Law, businesses shall take emergency measures immediately when a large amount of dioxins is emitted into air or public water areas.

(4) Measurement on the status of pollution caused by dioxins

As provided in Article 28 of the Dioxins Law, businesses shall implement the measurement of the pollution status caused by dioxins, with regard to emissions from facilities subject to the emission standards and to effluents from facilities subject to the effluent standards. The results of such measurements shall be reported to prefectural governors.

(5) Appointment of pollution control supervisors etc.

Pursuant to the provisions of Act on Pollution Prevention Organization in Specified Factories (Law No.107 of 1971), businesses shall appoint pollution control supervisors and pollution control managers for facilities emitting dioxins. Appointed persons shall conscientiously implement their duties including monitoring how those facilities emitting dioxins are being operated, etc.

2. Report dioxins releases etc. by businesses

Pursuant to the provisions of the Law Concerning Reporting etc. of Releases to the Environment of Specific Chemicals Substances and Promoting Improvements in Their Management (Law No.86 of 1999), businesses shall report dioxins releases etc. in the acknowledgement that dioxins are Type I designated chemical substances under Paragraph 2 of Article 2 of the same law and could cause serious health damages. In addition, businesses shall implement the management on the production, use, and other handling etc. of designated chemical substances including dioxins in accordance with the guidelines on measures regarding control of designated chemical substances etc. that businesses handling them should follow (guidelines for the management of chemical substances) stipulated in Article 3 of the same law, and shall also make efforts to reduce emissions by improving a system, preparing a guideline, inspecting and improving facilities etc., and also foster the general public's awareness of the actual status of the management of these chemicals and others.

3. Promotion of reducing, reuse and recycling of waste, etc. that could form dioxins

Pursuant to Article 11 of the Fundamental Law for Establishing a Sound Material-Cycle Society (Law No.110 of 2000, hereinafter referred as to "Recycling Law"), businesses shall minimize waste etc. that could release dioxins (refer to "waste etc." defined in Article 2, Paragraph 2 of the Recycling Law. The same shall apply hereinafter), by encouraging consideration in the process of development, manufacture, and distribution, self-restraint relating to the manufacture and sale of throwaway products and over-packaging, efforts to lengthen the life of products, etc. At the same time, businesses shall take necessary measures to promote the reuse or recycling of recyclable resources and shall cooperate with the

national government or local public authorities in carrying out their policies and measures for establishing a sound material-cycle society.

In addition, pursuant to the provisions of the Waste Management and Public Cleansing Law (Law No.137 of 1970, hereafter referred to as "Waste Management Law"), businesses shall take necessary measures for minimizing waste such as formulating a plan to deal with business establishments generating a large amount of dioxins emissions, etc. Businesses shall also take measures in compliance with the Law for Promotion of Effective Use of Resources (Law No.48 of 1991), the Law for Promotion of Sorted Collection and Recycling of Containers and Packaging (Law No.112 of 1998), the Specified Household Instruments Recycling Law (Law No.97 of 1998), the Law Concerning the Recycling of Construction Materials (Law No.104 of 2000), the Law for Promoting the Recycling of Recyclable Food Resources, etc. (Law No.116 of 2000), the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and other Entities (Law No.100 of 2000), the Law Concerning the Recycling etc. of End-of-Life Motor Vehicles (Law No.78 of 2002), etc. and shall further promote minimizing waste as well as the cyclical use of recyclable resources through their voluntary and active endeavors.

Section 3 Measures to be taken by the national government and local public authorities to promote the recycling and reuse of resources, and to reduce waste which could form dioxins

1. Promotion of measures for waste reduction

(1) Promotion of measures in compliance with the Recycling Law

Pursuant to Article 9 of the Recycling Law, the national government shall formulate the Basic Plan for Establishing a Sound Material-Cycle Society pursuant to Article 15 of the Recycling Law. Based on the 3R (Reduce, Reuse, and Recycle) Initiative, adopted at a Ministerial Conference in June 2004, the national government shall further promote the reduction etc. of wastes.

Local public authorities, pursuant to Article 10 of the Recycling Law, shall not only implement necessary measures to ensure appropriate recycling and disposal of recyclable resources, but also formulate and implement the policies in accordance with the natural and social conditions of the local public authorities' jurisdiction, based on the proper role-sharing with the national government for establishing the

sound material-cycle society.

(2) Promotion of measures in compliance with the Waste Management Law and other laws

Pursuant to the Basic Policy for comprehensive and systematic promotion of appropriate measures, including reduction of wastes (May 2001, Ministry of the Environment Notification No.34, hereinafter referred as to "Basic Policy"), in compliance with the provision of Article 5, 2. (1) of the Waste Management Law, the plan for improvement of waste disposal facilities established under the Basic Policy, the prefectural waste management program, and the municipal waste disposal program prescribing emission limitation measures for domestic wastes, the national government and local public authorities take necessary measures to minimize waste.

In addition, by formulating a basic policy and taking necessary steps in compliance with the Law for Promotion of Effective Utilization of Resources, the Law for Promotion of Sorted Collection and Recycling of Containers and Packaging, the Specified Household Instruments Recycling Law, the Law Concerning the Recycling of Construction Materials, the Law for Promoting the Recycling of Recyclable Food Resources, etc., the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and other Entities, the Law Concerning the Recycling etc. of End-of-Life Motor Vehicles, the national government and local public authorities shall promote waste reduction and the cyclical use of recyclable resources.

(3) Assistance to equipment investment required for waste reduction

In order to reduce wastes, the national government shall provide financial and technological support to any person who has installed an improved facility for waste reduction or recycling.

2. Achievement of waste reduction targets

With the aim to achieve "waste reduction targets" established in accordance with the "Basic Guidelines of Japan for the Promotion of Measures against Dioxins (decided in March, 1999, at the ministerial conference on dioxins)", the government shall promote unified and systematic waste reduction

measures.

3. Others

(1) Reduction and proper disposal of wastes from public facilities

The national government and local public authorities shall promote the reduction and proper disposal of wastes etc. from public facilities under the Basic Plan for Establishing a Sound Material-Cycle Society, the plan on measures for the national government to implement in order to restrict green house gas emissions etc. (National Government Action Plan) the national government formulates in accordance with Article 20, 2. (1) of the Act on Promotion of Global Warming Countermeasures (Law No.117 of 1998), and the plan on measures to restrict green house gas emission etc. (Local Government Action Plan) the prefectures and municipalities formulate in accordance with Article 20, 3. (1) of the act.

(2) Enhancement of environmental education/learning

Under the Recycling Law, the national government shall promote a wide range of integrated environmental education/learning, designed for cutting back on the amount of waste etc., including promotion of reduction, reuse and recycling of wastes etc.. For this end, exchanges of personnel and information shall be promoted between the public sector and the private sector. The national government shall enhance the supply and diffusion of information, personnel training, and educational programs etc., in order to ensure that environmental education/learning including that designed to reduce waste etc. discharges within the family, at schools, in workplaces, in local communities, and any other places. etc. under the Law for Enhancing Motivation on Environmental Conservation and Promoting Environmental Education (Law No.130 of 2003). The local public authorities shall endeavor to plan and implement measures regarding the promotion of environmental education.

Section 4 Other matters necessary to reduce dioxins resulting from business activities in Japan

1. Appropriate and smooth implementation of the Stockholm Convention

In order to reduce the total emissions of dioxins under the provisions of Article 5 of the Stockholm Convention, the national government shall take necessary measures, including the establishment and implementation of the Action Plan and the promotion of use of best available techniques (BAT) and best environmental practices (BEP).

2. Promotion of measures for sources of dioxins

(1) Promotion of measures against waste

The national government and local public authorities shall enhance the controls on illegal waste disposal through the enforcement of more rigorous monitoring measures under the Waste Management Law, the Air Pollution Control Law (Law No.97 of 1968), and the Dioxins Law.

In accordance with the Dioxins Law, the national government and local public authorities shall implement measures against soil pollution and also promote to implement or plan measures against sediment contamination, including removal of sediments.

The national government shall implement financial and technical assistance to local public authorities in installation of waste incinerators, and promote arrangement in such incinerators across wider areas. Furthermore, with respect to industrial waste incinerators, the national government shall improve model facilities by providing financial assistance for facilities improvement at waste disposal centers, and make further efforts to improve the sophistication of facilities by using financing mechanism of government-affiliated financial institutions.

Also, financial support is provided to the relevant local public authorities to appropriately promote the dismantling of general waste incinerators at the time of decommission, and encourage the effective reuse of vacant lots.

Prefectures shall provide advice etc. to municipalities to implement promptly a wide-area waste disposal facilities project formulated to enable the reduction of dioxins emissions associated with waste disposal.

(2) Promotion of measures against unregulated sources etc.

Of the sources specified in Annex C of the Stockholm Convention, the national government shall, in accordance with the provisions of Article 5 (d) of the Stockholm Convention, promote the use of BAT and BEP to new sources identified in the Action Plan, bearing in mind the guidelines on Best Available Techniques (BAT) and the guidance on Best Environmental Practices (BEP), (hereafter called “BAT and BEP guidelines” *) etc. and take appropriate measures under the law for ensuring the use of BAT.

Of the sources of dioxins not subject to control by the Dioxins Law and sources specified in Annex C of the Stockholm Convention, the national government and local public authorities shall systematically monitor the status of existing sources and new sources that are not specified in the Action Plan, and promote release reduction measures, taking into consideration the latest knowledge of emissions and the BAT and BEP guidelines.

Note*: Refers to the BAT and BEP guidelines adopted at the Conference of the Parties to the Stockholm Convention at its third session.

(3) Prohibition of open burning without using a proper incinerator

As provided in the Waste Management Law and the Offensive Odor Control Law (Law No.91 of 1971), open burning of waste, not using a proper incinerator, is prohibited.

3. Report of dioxins emissions etc.

(1) Publication of emission inventory of dioxins, etc.

The national government shall compile and publish an emission inventory of dioxins in waste incinerators etc. by sources and by media. In compiling the emissions inventory, emissions from main generation sources of dioxins are estimated annually, while estimations are carried out for other generation sources every few years.

Local public authorities shall publish to the public the results of measurement conducted by businesses under Article 28 of the Dioxins Law.

(2) Implementation of monitoring and surveys on the actual status of dioxins emissions and implementation of measures based on the results

The government shall annually and continuously monitor the status of dioxins in the environment, human bodies, waste incinerators and industries in a systematic manner, and publish the results to the public in a way easy to understand.

Local public authorities shall implement surveys, including regular observation, in accordance with the provisions of the Dioxins Law. Based on the results of such surveys, the national government and local public authorities shall take appropriate measures as necessary under the Dioxins Law etc.

(3) Promotion of effective and efficient measurement and QA/QC

In order to promote effective and efficient measurement and monitoring, the national government shall promote the diffusion of such methods to introduce quick and inexpensive simplified analytical methods to appropriate fields under appropriate circumstances in accordance with their special characteristics.

The government shall promote QA/QC in dioxins measurement by providing standard environmental specimens, administering the Measurement Licensor Approval Program (MLAP), and spreading the Guidelines on QA/QC for the Environmental Measurement of Dioxins (Environmental Agency, November 2000) and the Guidelines on Securing the Reliability of the Environmental Measurements of Dioxins Commissioned Outside (Ministry of the Environment, March 2001).

The national government shall provide systematic training to technical experts working in official testing organizations of local public authorities etc. to help them enhance their understanding of analytical techniques and their skills for using the technologies.

4. Promotion of research and investigations and technological development activities regarding dioxins

The national government shall promote the analysis of the dioxins generation and emission mechanism, research on effects on organisms and behavior of dioxins in the environment, and development of technologies for appropriate incineration, detoxification, and decomposition of wastes, and also promote

the introduction and diffusion of achievements of such technologies to push forward their use under appropriate circumstances.

5. Publication of accurate information and enhancement of disclosure to the general public

(1) Enhancement of publication and disclosure of information

The national government shall disclose and publish to the public accurate information concerning the impacts of dioxins on the human health and the environment, the results of research and development and international trends, including the relevant statistical data and their actual implications, in a prompt and easily understandable manner.

(2) Systematic activities designed to enhance public awareness

In order to effectively reduce wastes which result in emitting dioxins, it is essential for the public to recognize that people themselves generate wastes and impose burden on the environment and to reinforce their effort to reduce the environmental burden, including reducing wastes.

To ensure people’s better understanding and their more cooperation in addressing issues of dioxins, the national government shall intensify its unified and systematic public awareness activities such as preparing an inter-ministerial pamphlet, issuing an annual report, which will enlighten the general public on the current situation and future agendas in national efforts toward the goal of building a recycling and reuse-oriented society.

The national government shall also make best efforts to provide accurate information on dioxins through the National Consumer Affairs Center, local consumption centers, its periodicals, the internet, and mass media etc. It shall also take every opportunity to encourage the public to review their senses of value and lifestyles and shift them to generate and discharge less waste.

[Reference] Dioxins emissions inventory

Source of dioxins emissions	Total amount of dioxins emission (g-TEQ/year)													
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Facilities subject to reduction targets	7676~8129	3691~4144	2870~3201	2390~2521	1895~2007	937~960	368~393	340~362	323~347	286~311	281~299	212~217	153~154	155~156
"Water"	13	12	12	9	4	3	2	2	2	2	3	1	1	2
1 Fields of waste disposal	7205~7658	3355~3808	2562~2839	2121~2252	1689~1801	748~771	219~244	215~237	213~237	193~218	181~199	132~137	102~103	94~95
"Water"	5	5	5	3	2	1	1	1	0	1	2	1	1	1
Municipal waste incinerators	5000	1550	1350	1019	812	370	71	64	62	54	52	42	36	33
Industrial waste incinerators	1505	1105	695	558	535	266	75	70	73	63	60	42	34	29
Small-scale waste incinerators (subject to laws)	-	-	-	326	158	79	37	38	31	25	24	30	19	19
Small-scale waste incinerators (exempt from laws)	700~1153	700~1153	517~848	218~349	184~296	33~56	35~60	43~64	47~70	50~76	45~63	18~23	13~14	13~14
2 Fields of industry	470	335	306	268	205	189	149	125	110	93	100	80	50	61
"Water"	6.3	5.8	5.8	5.0	1.8	1.2	0.9	1.0	1.0	0.8	0.8	0.5	0.3	0.6
Electric steel-making furnaces	229	140	142	131	95.3	94.8	80.3	64.0	49.6	39.5	50.2	33.0	20.1	30.1
Sintering facilities for steel industry	135	114	101	69.8	65.0	51.1	35.7	30.4	29.3	21.2	20.5	22.5	9.1	10.9
Facilities for recovering zinc	47.4	25.4	21.8	26.5	9.2	14.7	5.5	8.1	4.1	8.2	1.8	3.1	2.1	2.3
Facilities for manufacturing aluminum base alloy	31.0	28.8	23.1	22.2	19.7	16.3	17.4	13.0	15.2	12.9	15.6	11.3	11.1	8.7
Other facilities	27.3	26.2	18.6	18.6	16.2	11.6	10.3	9.7	11.4	10.7	11.7	9.9	7.7	8.8
3 Others	1.2	1.2	1.2	1.2	1.0	0.5	0.6	0.4	0.5	0.2	0.3	0.2	0.1	0.2
"Water"	1.2	1.2	1.2	1.2	1.0	0.5	0.6	0.4	0.5	0.2	0.3	0.2	0.1	0.2
Sewage disposal facilities	1.1	1.1	1.1	1.1	1.0	0.5	0.5	0.4	0.5	0.2	0.3	0.2	0.1	0.2
Waste disposal sites	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Facilities exempt from reduction targets	3.6~6.2	3.7~6.4	3.7~6.5	3.7~6.4	3.7~6.5	3.8~6.7	3.8~6.8	3.8~6.8	3.7~6.7	3.8~6.8	3.9~7.0	3.4~6.1	2.3~3.9	2.3~4.1
Crematoria	2.1~4.6	2.2~4.8	2.2~4.9	2.2~4.8	2.2~4.9	2.3~5.1	2.3~5.1	2.4~5.3	2.4~5.3	2.5~5.4	2.6~5.7	2.2~4.9	1.2~2.8	1.2~3.0
Cigarette smoke	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1	0.1	0.1	0.1
Exhaust emissions from motor vehicles	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.2	1.1	1.0	1.0
Total	7680~8135	3695~4151	2874~3208	2394~2527	1899~2013	941~967	372~400	344~369	327~354	289~317	285~306	215~223	155~157	158~160
"Water"	13	12	12	9	4	3	2	2	2	2	3	1s	1	2

Note 1: WHO- TEF (1998) is used as the toxic equivalence factor for the calculation of emissions from 1997 to 2007. For emissions from 2008 to 2010, WHO- TEF (2006) is used to the extent possible.

Note 2: "Water" means amount released into water as part of releases.

Note 3: 0 (Zero) in the table is the result of rounding to the nearest whole number with amounts of dioxins emissions expressed in g-TEQ.

Note 4: It is considered that other sources of dioxins emissions that are not subject to this plan include "forest fire" "open burning". The amount of emissions to the air in FY2009 is estimated to be 0.06 g-TEQ/year. Also, "open burning" is prohibited in principle in Japan.