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

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.

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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. 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.

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

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 to develop and implement an action plan)
- Measures to reduce or eliminate releases from stockpiles and wastes including 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 bioaccumlation 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.

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.

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 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.

Chapter 2　The current status of Japan

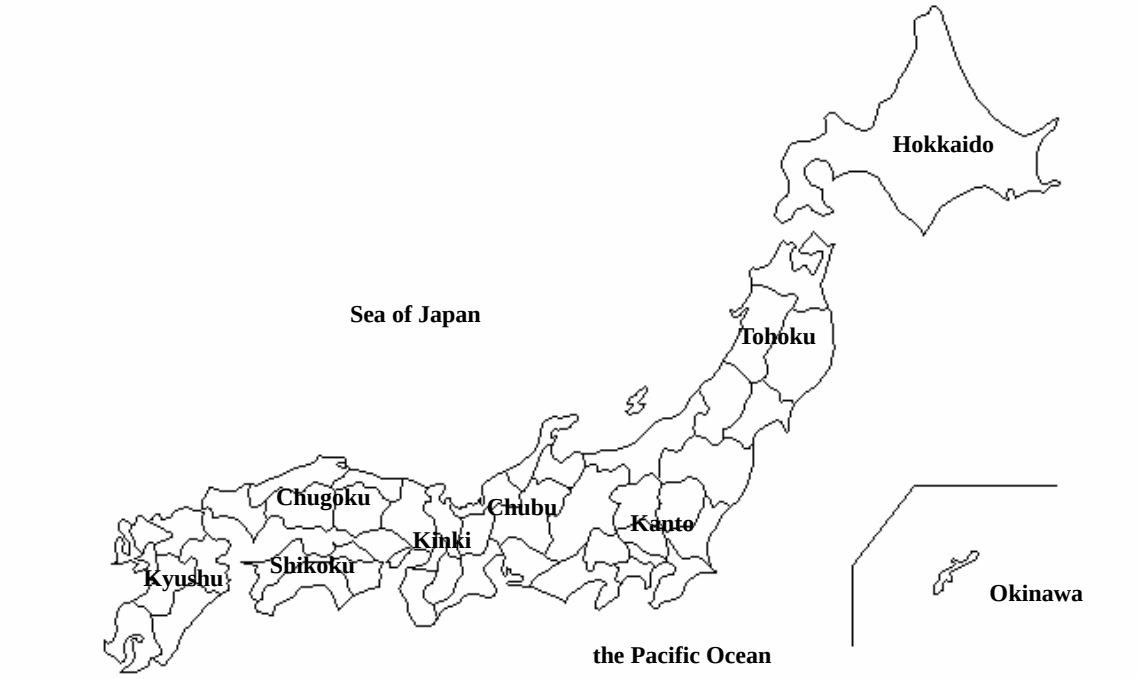
Section 1 Country profile

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 127 million (as of 2000).

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

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 2002, the average life expectancy is 78.3 years for men and 85.2 years for women.

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

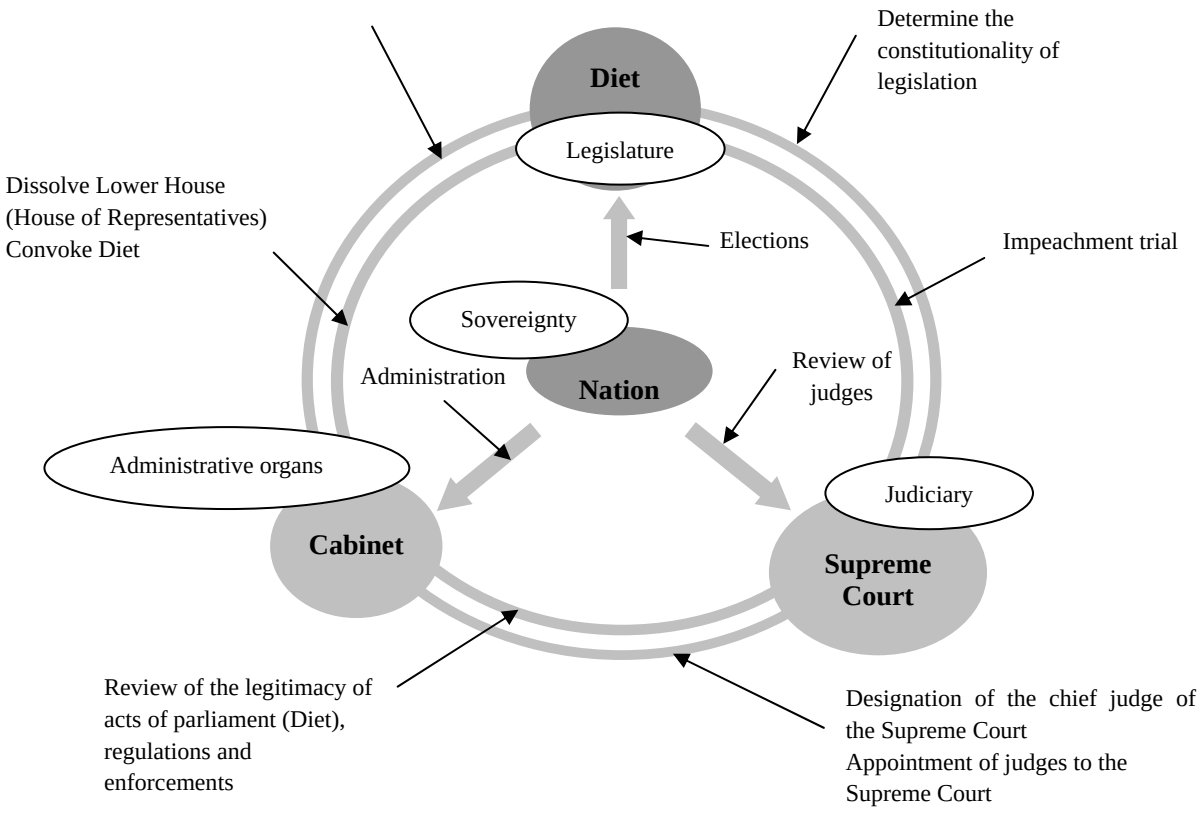
According to the Labour Force Survey in 2004, the population of 15 years old or more is 109.9 million. The unemployment rate is 4.7%.

2. Political structure

(1) Form of government

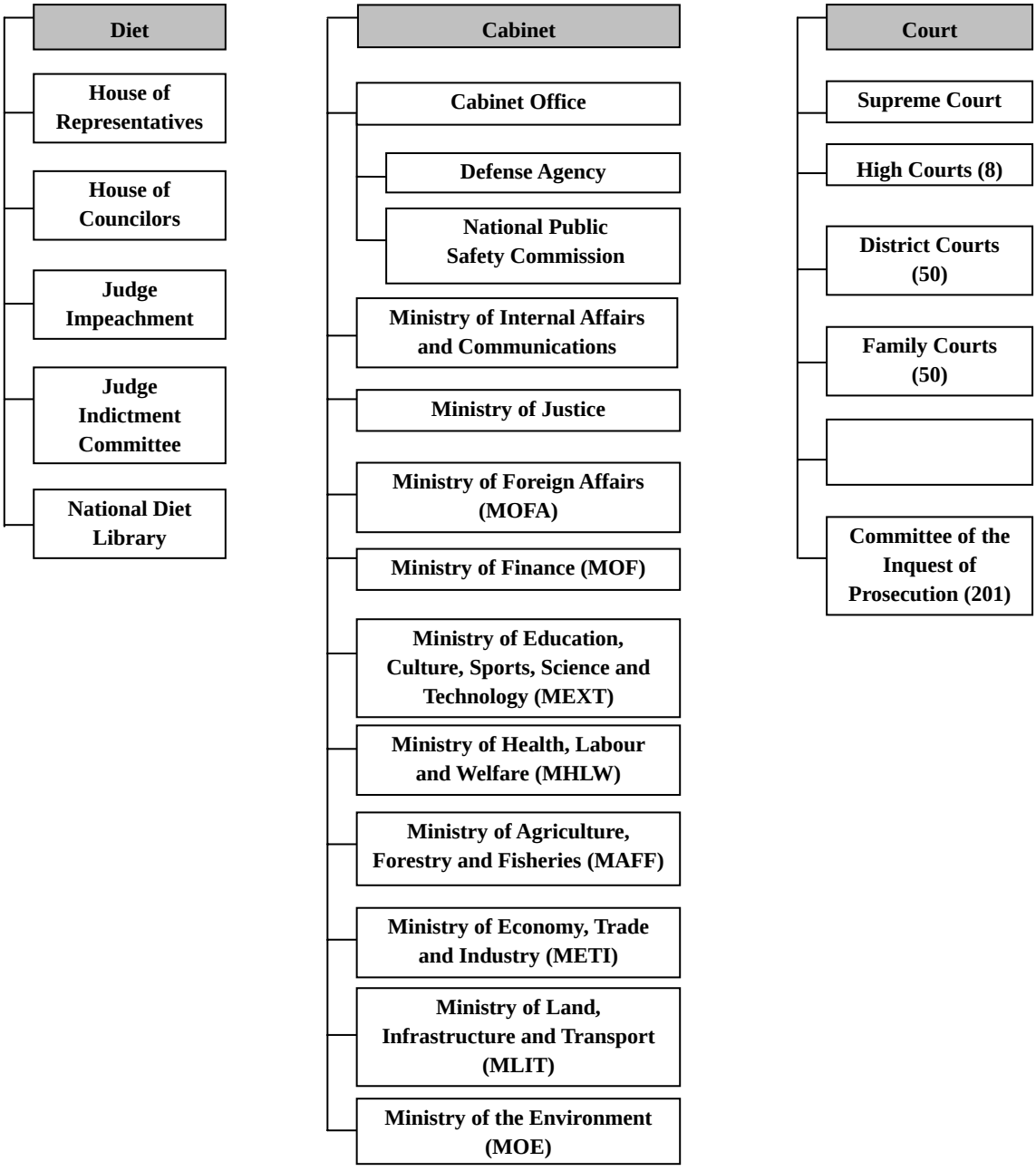
The present Constitution came into effect on 3 May 1947. The Cabinet Law came into effect at the same time, and with it the present cabinet system was established. In others words, under the sovereignty of the nation the separation of the three powers of the Executive, the Legislature and the Judiciary 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 10 ministries established under the Cabinet exercise administration. Furthermore, committees and agencies are established as external bureaux 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/constituition_and)_government_of_japan/charts_e.html)

(2) The number of local public authorities

There are 47 prefectures, 740 cities, 1,304 towns and 332 villages in Japan (as of June 2005). 35 cities have been designated as major urban cities (as of June 2005)

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 2002)	(2)Number of employees (thousand persons)(as of 2004)
Manufacturing	102,299 (20.5%)	9,935 (19.0%)
Mining	623 (0.1%)	38 (0.1%)
Agriculture, forestry and fisheries	6,613 (1.3%)	223 (0.4%)
Total	109,535 (21.9%)	10,196 (19.5%)

Source: (1) *Annual National Accounts*, Cabinet Office, (2) *Establishments and Enterprise Census*, 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	484,643 (84.1%)	76,469 (13.3%)	11,548 (2.0%)	3,456 (0.6%)
Agriculture, forestry and fisheries	15,628 (84.6%)	2,723 (14.7%)	105 (0.6%)	6 (0.0%)
Total of all sectors	5,235,181 (91.5%)	434,029 (7.6%)	42,981 (0.8%)	9,720 (0.2%)

Source: *Establishment and Enterprise Census*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: As of June 1, 2004. 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	1,686	17,785
Metal mining	50	935
Coal and lignite mining	24	786
Crude petroleum and natural gas	83	3,149
Food	52,133	1,253,965
Beverages, tobacco and feed	7,990	142,328
Textile mill products	29,868	207,313
Apparel and other finished products made from fabrics and similar material	40,731	377,318
Lumber and wood products except furniture	19,109	165,796
Furniture and fixtures	30,552	191,415
Pulp, Paper and paper products	13,940	261,381
Chemicals and related products	8,858	458,548
Petroleum and coal products	1,351	33,704
Plastic products	25,681	439,621
Leather tanning, leather products and fur skins	8,269	52,438
Ceramic, stone and clay products	25,525	351,391
Iron and steel	7,137	233,888
Non-ferrous metals and products	5,367	157,325
Fabricated metal products	74,149	786,402
General machinery	68,382	1,092,610
Electrical machinery, equipment and supplies	20,635	657,824
Transportation equipment	24,112	1,018,296
Precision instruments and machinery	10,872	237,497
Ordnance	22	3,426
Electricity	1,675	142,137
Gas	633	36,745
Heat supply	145	1,752
Water	756	11,074
Waste treatment services	14,115	203,067

Source: *2004 Establishment and enterprise Census*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: As of June 1, 2004

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, 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) Development of detoxification methods for agricultural chemicals containing POPs

In Japan, organic chlorine agricultural chemicals including certain POPs (aldrin, dieldrin, endrin, DDT and BHC) used to be stored in the ground. The report “The result of the investigation on the conditions of stored agricultural chemicals” published by the Ministry of Agriculture, Forestry and Fisheries in December 2001 shows that the total amount of stored agricultural chemicals and the number of the stored places identified on this investigation was 3,680 tons and 174 places respectively. A field investigation was carried out by the Ministry of the Environment in two districts with a view to assessing the actual conditions of the storage by farmers of agricultural chemicals containing POPs etc., which revealed that approximately 1-2% of farmers had held agricultural chemicals containing POPs etc. 2,066 kg of the agricultural chemicals containing POPs etc and 97,228 kg of the agricultural chemicals containing dioxins were collected by farmers’ cooperation etc. from 1998 to 2002.

The detoxification methods for agricultural chemicals containing POPs etc. have been verified and these chemicals are properly disposed of by these methods. Other issues involved in detoxification are also being addressed.

(2) Study for proper disposal of POPs wastes

Stored agricultural chemicals containing POPs etc. 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.

The followings are being addressed for other POPs based on the outcomes of the above mentioned development for detoxification methods etc. with a view to understanding the actual wastes emissions and formulating their disposal standards, etc.

- Estimation of the existing quantity of unintentionally produced POPs,
- Compilations of technical issues to be considered in respect of methods of collection, transportation and storage of POPs wastes,
- necessary studies for the development of POPs wastes disposal standard,
- Studying the monitoring method on the maintenance and management of POPs wastes disposal process.

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. Furthermore, certain POPs are being monitored as a part of monitoring project for potential endocrine disruptors, (hereafter referred to as “survey on the environmental endocrine disruption”) which started in 1998 in response to the concern over the potent impact of endocrine disrupting effects of chemicals.

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 2001. The section also briefly addresses the results of POPs monitoring since 2002. Concentration changes are analyzed using the data for specimens that mainly give measurement results above the detection limit. The detection rate （measurements above the detection limit / total number of measurements） is used as a supplementary indicator for POPs. Data are also provided on substances that are not subject to annual monitoring but were examined and documented in past surveys.（See Reference materials for main past activities in environmental monitoring and 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 FY2003 surveys;

- A total of 3,755 specimens from 986 sites across the country were surveyed. The 913 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 0.068pg-TEQ/m^3 with a range of 0.0066 to 0.72 pg-TEQ/m^3. Of these sites, one site exceeded the environmental quality standard for ambient air (excess rate of 0.1%).
- Surveys for the PCDDs/DFs concentration have been continued at 48 sites. The current average PCDDs/DFs concentration at these sites was substantially declining to 0.077 pg-TEQ/m^3, compared with 0.54pg-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 FY2003 surveys;

- A total of 2,126 sites across the country showed an average dioxins concentration of 0.24pg-TEQ/L with a range of 0.020 to 11 pg-TEQ/L. Of these sites, 51 sites (48 sites in rivers, two sites in lakes, and one site in a sea) exceeded the environmental quality standard for water of annual average of 1 pg-TEQ/L or less (excess rate of 2.4%).
- Surveys are continued at 1,397 sites. The current average concentration of dioxins at these sites has been declining to 0.23 pg-TEQ/L, compared with 0.36 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 FY2003 surveys;

- A total of 1,825 sites across the country showed an average dioxins concentration of 7.4 pg-TEQ/g-dry with a range of 0.057 to 420 pg-TEQ/g-dry. Of these sites, nine sites (seven sites in rivers and two site in seas) exceeded the environmental quality standard for bottom sediment of 150 pg-TEQ/g or less (excess rate of 0.5%).
- Surveys are continued at 1,042 sites. The current average concentration of dioxins at these sites has been slightly declining to 9.1 pg-TEQ/g-dry, compared with 11 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 FY2003 surveys;

- A total of 1,200 sites across the country showed an average dioxins concentration of 0.059 pg-TEQ/L with a range of 0.00032 to 0.67 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 FY2003 surveys;

- A total of 3,059 sites across the country showed an average dioxins concentration of 4.4 pg-TEQ/g-dry with a range of 0 to 1,400 pg-TEQ/g-dry. Of these sites, one site exceeded the environmental quality standard for soil of 1,000 pg-TEQ/g-dry or less (excess rate of 0.03%).
- An average dioxins concentration at 2,128 sites, targeted in a general environmental survey, was 2.6 pg-TEQ/g-dry with a range of 0 to 360 pg-TEQ/g-dry. An average dioxins concentration at 931 sites, targeted in a survey on areas surrounding sources was 8.5 pg-TEQ/g-dry with a range of 0 to 1,400 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 and shellfish from 543 sites showed an average dioxins concentration of 1.4 pg-TEQ/g-wet with a range of 0.032 to 33 pg-TEQ/g-wet. The current 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 started surveys on wild life in FY1997.

Regarding FY2002 surveys;

- A total of 72 specimens of birds, marine mammals and land mammals were examined. As expected from previous surveys, birds showed a high accumulation level among wild mammals and birds. The accumulation level was slightly higher in marine mammals than in land mammals.
- Compared with results from the surveys after FY1998, the accumulation level significantly decreased in short-lived mammal (Japanese field mice) in FY1999. And the level in FY2000 and FY2001 remained at almost same level as in FY1999.

(2) Polychlorinated biphenyl（PCB）

The government has been continuously monitoring biological specimens since 1978.

- Up to 2001, more than half of the fish specimens gave results above the minimum detectable concentration (0.01μg/g-wet).
- Especially in Tokyo Bay, Osaka Bay and Seto Inland Sea, which are closed water areas and located close to densely populated districts, the PCB concentration in bass is relatively high, compared with specimens in other areas. Although the concentration appears to be decreasing in Seto Inland Sea, the figure seems to be fluctuating in Tokyo Bay and Osaka Bay between tens and hundreds of ng/g-wet in a cycle of up to 10 years. Thus it is difficult to identify a clear trend. The PCB concentration in fish *tribolodon hakonensis* in Lake Biwa has remained stable at tens of ng/g-wet (See reference materials Figure 1).
- For bivalves, the PCB concentration in blue sea mussels in Naruto has been decreasing steadily for 20 years. For the last few years it has been below the minimum detectable concentration. On the other hand, the PCB level in common mussels of Miura Peninsula and in Ise Bay, initially decreasing, stays just above the minimum detectable concentration (See reference materials Figure 2).
- A highly sensitive measurement method was adopted in 2002. This method enables PCB detection in all biological specimens within a range of 0.2 to 550 ng/g-wet, making the current concentration level across the country available.

The government has been carrying out detailed analysis on PCB homologue and high-sensitivity measurement on coplanar PCB for air, water and bottom sediment in FY2001. It has been carrying out the same high-sensitivity measurement since 2002.

- The total PCB concentration in air sampled in the autumn of 2001 ranged between 62 and 1,700 pg/$m^{3,}$ almost the same as 2002 and 2003. At sites recording over 1000 pg/m^3, high-chlorinated homologues prevailed in isomer patterns, suggesting strong local influence on areas surrounding the sampling sites. A 3-day measurement in Osaka Prefecture did not suggest a marked daily fluctuation in the PCB concentration.
- The total PCB concentration in water varies widely between 3.6 and 3,300 pg/L. At a number of ports and estuaries near large cities, such as those on Tokyo Bay and Osaka Bay, the PCB concentration exceeded 1,000 pg/L (See reference materials Figure 3). At some sites, dichlorides showed an extremely strong presence in environmental mediums, compared with those at other sites. It is therefore necessary to carry out further surveys (See reference materials Figure 4).
- The total PCB concentration in bottom sediment also varies widely from tens to hundreds of thousands of pg/g-dry. The PCB level is especially high in ports and estuaries on Tokyo Bay and Osaka Bay (See reference materials Figure 5). In Nagasaki Port, Dokai Bay and estuary of Oita River, the level recorded one hundred thousands of

pg/g-dry. At some sites, a peak appeared around hexachlorides as well as trichlorides and tetrachlorides.

The environmental quality standard for water and soil requires that PCBs should not be detected by the gas chromatography method at the minimum determination level of 0.0005 mg/L. The FY2003 survey on public waters and groundwater ascertained that all measuring sites meet the standard.

(3) Hexachlorobenzene（HCB）

The government has been monitoring the HCB concentration in organisms since 1978, except in 1997 and 1999. In 2002, it applied a new high-sensitivity measuring method.

- Data available up to 2001 suggested that while the HCB level in demersal fish *sebastes iracundus* and sea bird *larus crassirostris* on Kabu Island was slightly above the minimum determination level of 1 ng/g-wet, the level was below the minimum determination level in all other specimens. The analytic method adopted in 2002 is capable of detecting HCB at less than 10 ng/g-wet in almost all specimens.

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. The level has been measured since 2002 by a high-sensitivity analytic method.

- In these surveys, HCB was detected at all measuring sites. In 1999, the HCB concentration ranged between 71 and 510 pg/m^3 (the Survey on Development of an Analytic Method for Chemicals) and between 180 and 400pg/m^3 (the Environmental Survey on Endocrine Disruptors). Data obtained since 2002 have produced similar results. The concentration level was lowest on Mt. Norikura in a background district and relatively high in Tokyo, Osaka and Kyoto. In Tokyo and Osaka, the daily fluctuation in HCB concentration was in a low range (See reference materials Table 5), while it was much higher in Kyoto in 2002.

The government started measurement for the HCB concentration in bottom sediment in 1986. Until 2001, a substantial reduction was not reported in the frequency of detection and concentration of HCB in bottom sediment. With the introduction in 2002 of a high-sensitivity analytical method, it is possible to detect HCB at all sites. Now the HCB concentration is known to vary within a range from 10 or less to over 10,000 pg/g-dry.

(4) Aldrin, dieldrin and endrin

The government has been continually measuring the concentration of drins in organisms since 1978. The frequency of detection and concentration of aldrin and endrin decreased steadily until these chemicals almost ceased to be detected. For this reason, measurement of aldrin and

endrin was suspended between 1994 and 2001. The government has been carrying out the measurement of dieldrin every 2 years until 2001 because the frequency of detection gradually fell. Since 2002, surveys have been conducted every year with the introduction of the high-sensitivity analytical method.

- Dieldrin was detected in a number of bivalve specimens. Its concentration was particularly high in blue sea mussels in Naruto at 90 ng/g-wet in 2000.
- In the 1998 Environmental Survey on Endocrine Disruptors, aldrin or endrin was not detected in water, bottom sediment, soil or organisms (the minimum detectable concentration was 50 ng/L in water specimens, 10 ng/g-wet in biological specimens, 10 ng/g-dry in bottom sediment specimens and 5 ng/g-dry in soil specimens). With the introduction in 2002 of the high-sensitivity analytical method, it is possible to measure the concentration of aldrin or endrin in almost all specimens, except for aldrin in organisms.

Dieldrin in bottom sediment has been measured since 1986. A concentration as low as about 1 ng/g-dry or less has been reported at a number of sites.

(5) DDT

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. Also since 1986, bottom sediment specimens have been measured for three p,p'-DDTs. In 2002, a high-sensitivity analytical method was adopted for six DDTs in all specimens.

- Until 2001, the frequency of detection of DDTs in biological specimens declined as a whole. For fish and shellfish, the DDT concentration was below the minimum detectable level of 1 ng/g-wet in nearly half of the specimens. After 2002, it is possible to detect at least one of the six DDTs.
- In specimens from the Kansai district (bass in Osaka Bay and Seto Inland Sea, *tribodon hakonensis* in Lake Biwa, and blue sea mussels in Naruto), the concentration of p,p'-DDE has been decreasing for the last 20 years (See reference materials Figure 6). On the other hand, specimens taken from the northern part of Japan (Kanto district and more northern areas) initially recorded a lower concentration than those in the Kansai district, but has seen no substantial annual change in concentration (bass in Tokyo Bay, *sebastes iracundus* in Hokkaido and blue sea mussels off Miura Peninsula, See reference materials Figure 7).
- While the concentration of metabolite DDE is high in most specimens, fish *sebastes iracundus* in Hokkaido alone demonstrates a relatively high concentration of DDT (See reference materials Figure 8).

- The DDT concentration in bottom sediment has remained relatively constant for the last 10 years or so. Until 2001, DDT was identified in about half the specimens. Since 2002, DDT has been found in all specimens.

(6) Chlordanes

The government started the measurement of chlordane for biological specimens in 1978. Since 1986, bottom sediment specimens have continually been examined.

- Regarding fish, a high chlordane concentration has been detected in bass in Tokyo Bay and Osaka Bay and *tribodon hakonensis* in Lake Biwa (See reference materials Figure 9). As a whole the chlordane concentration is on the decline (See reference materials Figure 10). The concentration is less than 10 ng/g-wet for trans-nonachlor, cis-nonachlor, cis-chlordane and chlordane. In recent years, the chlordane concentration has not been detected in bass from Seto Inland Sea. In *sebastes iracundus* in Hokkaido, nonachlor was detected close to the minimum detectable concentration. Since 2002, chlordane has been found in all biological specimens.
- For shellfish, chlordanes were detected until 2001 in specimens from Miura Peninsula, Ise Bay and Naruto. The concentration, however, has been decreasing to a range within ten times the minimum detectable level.
- The chlordane concentration in bottom sediment tends to be relatively high near large cities (See reference materials Figure 11). While the frequency of detection largely remained unchanged until 2001, the maximum concentration has been declining over the years. Since 2002, the concentration level has been detectable in almost all specimens.

(7) Heptachlor

The government started the measurement of heptachlor for water, bottom sediment and organisms in 1982. It started the measurement of air in 1986. Heptachlor was detected in about 10% and 20% of the specimens from bottom sediment (the minimum detectable concentration of 0.2 to 0.3 ng/g-dry) and organisms (the minimum detectable concentration of 1 ng/g-wet), respectively, within a range of about 10 times the minimum detectable concentration. Meanwhile no heptachlor concentration was identified in water (the minimum detectable concentration of 5 ng/L) or air (the minimum detectable concentration 1 ng/m^3).

The heptachlorepoxide concentration was measured in 1982 and 1996 for water, bottom sediment and biological specimens, and in 1986 for air. Heptachlorepoxide was found in a small number of specimens from bottom sediment and organisms at a low concentration level of up to several times the minimum detectable concentration of 5 ng/L (1982) or 50 ng/L (1996) for water, 0.2 to 1 ng/g-dry (1982) or 21 ng/g-dry (1996) for bottom sediment, 1ng/g-wet (1982) or 5ng/g-wet

(1996) for biological specimens, and 0.5ng/m^3 for air specimens.

In 2002 a high-sensitivity analytical method was introduced. Currently the concentration level can be measured for most specimens.

(8) Toxaphene and mirex

The government started the measurement of toxaphene and mirex for 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 μg/g-dry for bottom sediment. Nor was mirex detected at the minimum detectable concentration of 0.01 μg/L for water and 0.0006 to 0.0024 μg/g-dry for bottom sediment.

A high-sensitive analytical method was introduced in 2003. In the 2003 survey, mirex was found in almost all specimens, although at a low level. A relatively high concentration was confirmed in bottom sediment specimens taken from several seaports, including Kure and Yokohama ports. Toxaphene was not detected in water or bottom sediment. Instead, it was found in some organisms, especially in *larus crassirostris* and saury. A low toxaphene concentration was also perceived in air.

(9) Data on other wildlife

The government has been measuring PCB, HCB, DDT, chlordane, heptachlor epoxide and dieldrin since 1998 to identify their effects on wildlife as part of the Environmental Survey on Endocrine Disruptors. The specimens taken include land animals such as raccoons, bears, monkeys and frog, and marine mammals such as seals and whale, in addition to domestic pigeon, bird *phalacrocorax carbo* and birds of prey. A relatively high concentration of POPs was seen in birds of prey and *phalacrocorax carbo*. Eggs of mountain hawk eagles were also found to give a higher concentration of PCB, DDT, Heptachlor epoxide, chlordane and dieldrin than other wildlife specimens (See reference materials Table 6).

(10) 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) For about 10 years, the average concentration or the detection rate have remained almost constant for a small number of POPs. Nonetheless, these indicators have been decreasing for most POPs during the last 20 years.

(iii) Among POPs, PCB has the highest detection rate. Although DDTs, chlordanes and HCB are

still found in bottom sediment, their concentrations were low enough to stay close to the minimum detectable level. In contrast, their concentrations are high around large cities.

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, which was established in September 2001 under the Dioxins Law, set a target of achieving 90% reduction in dioxins emissions at the end of 2002 from the 1997 estimate. Dioxins emissions in 2003 totaled 372 to 400 g-TEQ, a 95% reduction from the 1997 level, meeting the reduction target.

Thus, while dioxins emissions have been significantly reduced, unidentified or new sources of emissions may be identified in the future, because of their unintentional nature of production. There are still a number of sites that fail to achieve the environmental quality standards. In addition, there are still cases where soil and other media are found contaminated. Thus, the current measures must be implemented steadily, including monitoring of sources of emission, total emissions and environmental contaminations, as well as implementation of countermeasures at highly contaminated sites and smooth dismantling of disused incinerators. It is essential at least to maintain the current emission level on a long-term basis by these measures. At the same time, further development of a pollution control strategy is essential in line with development of science, mindful of the latest development of risk assessment.

(2) Polychlorinated biphenyl（PCB）

PCBs are designated as Class I specified chemical substances 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. Such efforts must be reinforced in the future. The sources categories of release and formation processes for PCBs released unintentionally are similar to those for dioxins. Therefore, the measures currently taken for dioxins are expected to help reduce PCB concentrations as well. Nevertheless, PCBs are still detected in the air. Therefore, it is required to monitor the concentrations constantly as well as to deliberate measures to reduce PCB release.

(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. In monitoring surveys on organisms, the hexachlorobenzene concentration remains below the minimum determination level for most specimens. Although bottom sediment does not show a marked decline in the hexachlorobenzene concentration, it has held constant slightly above the minimum detectable level. Meanwhile, the source categories of release 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 air. Therefore, it is required to monitor the concentrations constantly as well as to deliberate measures to reduce HCB release.

(4) Aldrin, dieldrin, endrin and heptachlor

Since the 1970s-1980s, the manufacture, use and other activities regarding aldrin, dieldrin, endrin and heptachlor have been regulated under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other relevant laws and regulations. These regulations are considered to have been effective as seen in a continuous decrease in the frequency of detection of aldrin, dieldrin, endrin and heptachlor in the environment. In the future, if these chemicals are found in the stored agricultural chemicals, sound implementation of the treatment will be needed. Crops such as cucumber are prone to absorb drin agricultural chemicals when planted in the field where they used before, and therefore it is possible that these chemiclas are found in the crops over the Maximum Residue Limit. Government has provided guidance on change of crops, and subsidies for the replacement of soils.

(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 identified in bottom sediment, their concentration is not far above the minimum detectable level. In the future, if DDTs are found in the stored agricultural chemicals, sound implementation of the treatment will be effective

(6) Chlordanes

The manufacture, use and other activities regarding chlordanes have been regulated since the 1960s-1980s under the Chemicals Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Considering the chlordane concentration has been decreasing for years in bottom sediment and organisms, such as shellfish, the current governmental

measures have been largely successful. 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 1983 survey confirmed their absence from water or bottom sediment. A high-sensitivity analytical method was introduced in 2003. In the 2003 survey, mirex was 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 substances under the Chemical Substances Control Law and are designated as agricultural chemicals of which the sale and use is prohibited under the Agricultural Chemicals Regulation Law. Therefore, under these laws, necessary measures to control these chemicals have been already implemented.

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 the 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 a 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 the disposal of polychlorinated biphenyls (PCB) waste 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, 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, the prior evaluation of new chemical substances and hazard assessment of existing chemical substances are undertaken. According to the properties of chemical substances identified in these assessments, these substances are categorized

into Class 1 Specified Chemical Substance, Class 2 Specified Chemical Substance, Type 1 Monitored Chemical Substance, Type 2 Monitored Chemical Substance, Type 3 Monitored Chemical Substance or Chemical Substance Not Subject to Regulation and are subject to regulation according to their category. 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 1 Specified Chemical Substance and are subject to regulatory measures such as prior notification for the manufacture and (or) import (virtually prohibited), limitation and prohibition of any use other than specified uses or mandatory reporting system (virtually prohibited) etc. Currently 15 chemical substances are designated as such, including 10 chemicals designated under the POPs Convention except PCDDs and PCDFs, which are not manufactured intentionally.

Furthermore 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.

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 which the distribution is prohibited shall also be prohibited to use by Article 11. The nine chemicals out of the chemicals designated under the Stockholm Convention such as DDT, aldrin, dieldrin, endrin, chlordane and heptachlor which have been used as agricultural chemicals in Japan, and mirex, toxaphene and HCB which have never been used in the agricultural field in Japan. They have been currently prohibited on the distribution and use under the law.

The inspection and the maximum content limit for Dioxins in agricultural chemicals is stipulated in paragraph 3 of Article 14. Under the inspection, the contaminated amount of Dioxin in all agricultural chemicals has been below the stipulated level since January 2000.

3 Measures under the Pharmaceutical Affairs Law

Item 3, Paragraph 2, Article 14 of the Pharmaceutical Affairs Law (also note 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, dose, and administration, indications and usage, performance, side-effects etc.. Currently no drugs etc. including the chemicals designated under the Stockholm Convention have been 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 POPs 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 2003) and future predicted 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 78%, 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 2003 were 372-400 g-TEQ per annum, which represents a decline of approximately 95% from the level of releases in 1997 (7,680-8,135 g-TEQ per annum). Furthermore, the level of releases in 2010 is predicted to decrease to the order of 315-343 g-TEQ per annum, due to the continued facilitation of measures to reduce releases, representing a reduction of approximately 15% from the level of 2003.

Source categories	Releases(g-TEQ per annum)		
	Estimated amount for 2003	Predicted amount for 2010	Estimated amount for 1997 (Reference year)
Part II source	278-303 (water) 1.1	220-245 (water)0.85	7,420-7,873 (water)6.4
Waste incinerators	219-244 (water)0.60	164-189 (water)0.35	7,205-7,658 (water) 5.3
Production of pulp	0.46 (water)0.46	0.46 (water)0.46	0.74 (water)0.74
Thermal processes in the metallurgical industry	58.6 (water)0.036	55.5 (water)0.036	213 (water)0.35
Secondary copper production	—	0.048	0.053
Sinter plants in the iron and steel industry	35.7	35.7	135
Secondary aluminum production	17.4 (water)0.029	14.3 (water).029	31.0 (water)0.34

		Secondary zinc production	5.5 (water)0.0066	5.5 (water)0.0066	47.4 (water)0.0036
Part III source			89.4-92.2 (water) 0.24	89.5-92.7 (water)0.24	250-253 (water)4.9
	Thermal processes in the metallurgical industry not mentioned in Part II		82.5	82.5	239
	Fossil fuel-fired utility and industrial boilers		2.0	2.0	1.6
	Firing installations for wood and other biomass fuels		0.078	0.078	0.042
	Specific chemical production processes[*2]		0.54 (water) 0.24	0.54 (water)0.24	5.1 (water)4.9
	Crematoria		2.3-5.1	2.6-5.8	2.1-4.6
	Motor vehicles		1.4	1.2	1.4
	Smouldering of copper cables		0.59	0.59	1.2
Other sources			5.1-5.2 (water)0.76	5.1-5.2 (water)0.74	10.1-10.2 (water)1.4
Total			372-400 (water) 2.1	315-343 (water) 1.8	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.

Note 6: “Production of pulp” stands for “Production of pulp using elemental chlorine or chemicals generating elemental chlorine” in Annex C.

(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) is 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 - 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) - 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	10

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.

The central government provides financial assistance to local public authorities to facilitate the dismantling and disposal of decommissioned general waste incinerators, and encouraging 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 Reduction Plan as modified in June 2005:

As regards (a) above, the aggregate reduction target set on each business field shall be 315-343 g-TEQ per annum as of 2010.

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) Management of dioxins

Implementation of management on production, use, and other handling etc. of designated chemical substances etc. in compliance with the Chemical Substances Release Reporting and Management Promoting Law and enhancement of the general public’s awareness of the actual

status of the management of these chemical substances and others.

(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

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

(ii) Achievement of waste reduction targets

(iii) Others

Reduction and proper disposal of wastes 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 including further enhancement of controls on illegal waste disposal through the enforcement of more rigorous monitoring measures under the Waste Management Law, the Air Pollution Control Law and the Dioxins Law; promotion of measures against unregulated sources etc.; promotion of financial and technical assistance to local public authorities for their municipal waste incineratiors and promotion of proper installation of such incinerators; promotion of upgrading equipment installed in industrial waste incinerators; and, assistance to equipment investments required for release reduction measures

(iii) 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.

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

(v) 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)

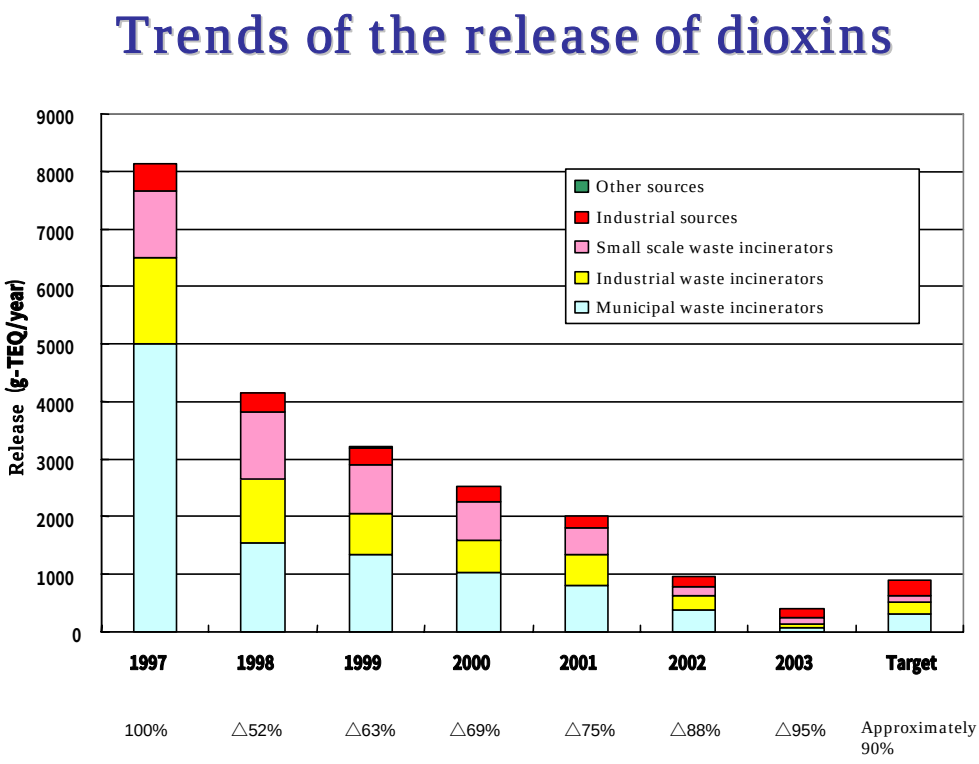
B) Assessing the effectiveness of laws and policies

As a result of the measures taken so far, releases of dioxins are estimated to have been reduced by approximately 95% in 2003 from the level in 1997, and the reduction target established by the Reduction Plan before it was modified (The reduction target as of the end of March 2003: 843-891 g-TEQ/year) has been achieved.

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) to reduce total releases from anthropogenic sources with the goal of their continuing minimization and where feasible, the ultimate elimination, and that the Conference of the Parties shall adopt the general guidance to be taken into consideration when applying BAT and BEP. At the first Conference of the Parties of the Stockholm Convention held in May 2005, the draft guidelines and guidance was presented, which is to be taken into consideration when applying BAT and BEP (hereafter referred to as the draft BAT and BEP guidelines). However, the draft was not adopted as it was considered that the draft BAT and BEP guidelines needed further modifications in terms of improving its clarity, addressing the needs of developing countries, and adding alternative approaches etc.

However, the Conference of the Parties adopted a decision encouraging the Parties to take into consideration the draft BAT and BEP guidelines when working out their action plans. As a result, Japan will continue to take measures for reducing releases of dioxins by requiring or promoting the use of BAT and BEP, which taking into consideration the draft BAT and BEP guidelines.



(3) Strategy to promote the reduction of total releases

A) Promotion of Reduction Plan

Because dioxins are unintentionally produced when burning materials, it is probable that unidentified sources or new sources might come to light in the years to come. Article 5 of the Stockholm Convention refers to the goal of continuing to minimize releases of unintentionally produced substances including dioxins, and where feasible, ultimately eliminating their release. Therefore, it is important that continued measures should be taken to reduce releases. Japan will continue to steadily take the measures incorporated into the Reduction Plan toward achieving the goal of reducing releases by approximately 15% by 2010 from the level of 2003.

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 guidelins, with a view to achieving the goal of continuing to minimize the release of dioxins, and where feasible, their elimination.

Furthermore, in case that the draft BAT and BEP guidelines is adopted at the third Conference of the Parties of the Convention, Japan will take necessary measures based on the contents of the guidance.

(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, which actually meets the Achievable Performance Level (hereafter referred to as the APL) set forth in the draft BAT and BEP guidelines submitted to the first Conference of the Parties to the Stockholm Convention. The same emission standard that is applicable to a waste incinerator shall also be applied to cement kilns combusting waste, which shall be deemed to be a waste incinerator under the Waste Management Law. 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 2004, there were 12,120 waste incinerators subject to the emission

standard under the Dioxins Law and 3,003 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 219-244 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.60 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 2004, there were 101 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 0.46 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 2004, there were 31 specified facilities under the Dioxins Law. The amounts of releases of dioxins from sinter plants are estimated to be 35.7 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 2004, there were 791 specified facilities subject to the emission standard under the Dioxins Law and 87 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 17.4 g-TEQ per annum, of which releases into waters are estimated to be in the order of 0.029 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 2004, there were 20 specified facilities subject to the emission standard under the Dioxins Law and 17 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 5.5 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.0066 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 2003. 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) for new sources that fall within the purview of the above-mentioned sources (except

facilities for recovering copper mentioned in (f) above). The release standard value for a new plant reflects the contents of the draft BAT and BEP guidelines, and accordingly this standard will continue to be applied (except aluminum alloy production facilities and facilities for recovering zinc mentioned in (d) and (e) above) . For facilities for manufacturing aluminum base alloy and facilities for recovering zinc whose emission standard for new ones is higher than the APL, the required measures will be examined taking into account the draft BAT and BEP guidelines, and the required measures will be taken on the basis of the results.

For existing sources, BAT and BEP shall be promoted, taking into account the draft BAT and BEP guidelines etc.

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 2004, there were 116 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 80.3 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 2004, there were 109 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 0.24 g-TEQ per annum.

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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 2.3-5.1 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.
- Diesel engine motor vehicles will be de facto obliged to be equipped with a diesel particulate filter (DPF), in order to meet the standard for motor vehicle waste gas emission control concerning particulate matters, which is to be enhanced from October 2005.

(Amounts of releases etc)

- The amounts of releases of dioxins from motor vehicles are estimated to be 1.4 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 draft BAT and BEP guidelins.
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, 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, and in local communities 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 accordingly.

(7) Schedule for implementing the action plan

The various measures for reducing releases shall be implemented in a systematic manner by 2010, which is the deadline for achieving the reduction goals of the Reduction Plan.

2.Hexachlorobenzene（HCB）

(1) HCB release in Japan

As of 2002, HCB release in Japan was calculated as below:

Source of emission	Emission (kg/year)

Part II Source categories			**85**
	Waste incinerators		44 Water 0.061
	Cement kilns		11
	Production of pulp		0.080 Water 0.080
	Thermal processes in the metallurgical industry		30
		Secondary copper production	-
		Sinter plants in the iron and steel industry	16
		Secondary aluminum production	3.0
		Secondary zinc production	11
Part III Source categories			**100**
	Thermal processes in the metallurgical industry not mentioned in Part II		100
	Fossil fuel-fired utility and industrial boilers		0.38
	Firing installations for wood and other biomass fuels		0.034
	Specific chemical production processes		0.24
	Crematoria		0.16
	Smouldering of copper cables		0.42
Other source categories			1.9
Total			**190**

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: “Production of pulp” stands for “Production of pulp using elemental chlorine or chemicals generating elemental chlorine for bleaching” in Annex C.

(2) Measures to reduce HCB release

HCB is thought to be unintentionally formed in the combustion processes similar to those for dioxins. The ongoing action plan for dioxins shown in the section 4 subsection 1 will thus be effectively applicable to the reduction of HCB production and its release to air.

A survey on sources of release will be continued to maintain HCB release data. Based on the survey results, deliberation will be given to determine the necessity of additional measures to reduce HCB release

3. Polychlorinated biphenyl（PCB）

(1) PCB release in Japan

As of 2002, PCB release in Japan was calculated as below:

Sources of emission			Emission (kg/year) *2
Part II source categories			450
	Waste incinerators		15 Water 0.18
	Cement kilns		350
	Production of pulp		5.7 Water 5.7
	Thermal processes in the Metallurgical industry		82
		Secondary copper production	-
		Sinter plants in the iron and steel industry	45
		Secondary aluminum production	10
		Secondary zinc production	26
Part III source categories			100
	Thermal processes in the metallurgical industry not mentioned in Part II		100
	Fossil fuel-fired utility and industrial boilers		0.84
	Firing installations for wood and other biomass fuels		0.28
	Specific chemical production processes		0.031
	Crematoria		0.44
	Smouldering of copper cables		0.084
Other source categories			5.1
Total			560

Note 1: “Water” means amount released into water as part of releases.
Note 2: All homologues of PCB are measured in Japan
Note 3: The total figure is not compatible with the sum of figures in each column due to rounding
Note 4: “Production of pulp” stands for “Production of pulp using elemental chlorine or chemicals generating elemental chlorine for bleaching” in Annex C.

(2) Measures to reduce PCB release

PCB is thought to be unintentionally formed in the combustion processes similar to those for dioxins. The ongoing action plan for dioxins shown in the section 4 subsection 1 will thus be effectively applicable to the reduction of PCB production and its release to air.

A survey on sources of release will be continued to maintain PCB release data. Based on the survey results, deliberation will be given to determine the necessity of additional measures to reduce PCB release.

For release 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.

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. In 1973, the Chemical Substances Control Law was enforced to ban the production and use of PCBs, practically prohibiting the importation of PCBs 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.

Currently, transformers, power condensers and some other devices containing PCBs 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 a limited number of other products, and these would require immediate attention. The project will therefore focus initially on these products. As to smaller waste electrical devices such as stabilizers and other contaminated materials, including carbonless copying paper, which contain only a small amount of PCB, deliberation will be accelerated on the establishment of a treatment system for these materials. At the same time, it is necessary to evaluate new and existing waste disposal technologies, with top priority placed on ensuring safety. The recent advancement of disposal technology for PCB wastes from stabilizers now enables safer treatment of stabilizers. In project sites where large volumes of disused stabilizers are left untreated, an appropriate treatment system will be launched at as soon as possible. For other devices and project sites, effort will be strengthened to develop a comprehensive waste disposal system in line with new technologies expected in the future.

In the construction of wide-area waste disposal facilities, JESCO is targeting small and medium-sized enterprises and other business which can commission JESCO to treat their PCB wastes and in doing so reduce their financial burden. The corporation plans to ensure the minimum treatment capacity for these facilities by having these wastes brought to the facilities in a systematic manner during the treatment period.

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 other materials as well as high-voltage transformers and waste PCBs existing in all project sites.	Stage I: 0.5 t/day (in PCB decomposition) For Stage II, the capacity will be determined based on data of PCB volumes requiring treatment.	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, and other devices and materials	1.8 t/day (in PCB decomposition)	Waste disposal to start earliest after October 2006. Project to terminate in March 2016.

Enterprises which hold large volumes of waste PCBs, PCB-containing waste oils and disused pole-mounted transformers that contains 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.

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 (“high-voltage transformers and other devices”) during the period to 2016, when treatment of PCB wastes is to be terminated under the law.

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. They require dismantlement or removal of oils. “Disposal volume” below allows for such cases.

(1) High-voltage transformer and other devices

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 current storage volume.

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

Fiscal year	Disused volume (t)	Disposal volume (t)	Storage volume (t)
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.

(3) Pole-mounted transformer

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:

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

(1) Identification and management

In 1971, the distribution of organochlorinate agricultural chemicals was prohibited or restricted under a ministerial ordinance, because their extreme persistence was confirmed. The government issued a guidance to store them in the ground.

In 1972, an agricultural chemicals safety project was launched. Under this project, Ministry of Agriculture, Forestry and Fisheries made guidance to store as much as 3 tons of agricultural chemicals in the ground.

To systematically and adequately dispose of these stored agricultural chemicals containing POPs (hereafter referred to as stored agricultural chemicals), a survey was conducted in

2001. The survey identified 174 sites nationwide and total 3,680 tons that had been stored in the ground.

To manage stored agricultural chemicals, these stored sites are inspected regularly while an environmental survey is conducted in accordance with the Interim Manual for Survey and Excavation of Pesticides Stored in the Ground (Water Environment Department, Ministry of the Environment). If the survey detects a difficulty to maintain the present condition of stored agricultural chemicals such as potential pollution at a store site, the stored agricultural chemicals must be dug out and stored above ground until they are finally disposed of.

For excavated agricultural chemicals, the interim manual advised that (1) an enclosure be provided around the sites, (2) a signboard be set up, providing information necessary for storage, and (3) measures be taken to prevent the waste from spreading into the air, water, ground and/or emitting odor from the store site (i.e. use of impermeable materials on the bottom and restriction on heap height, and other necessary measures).

Agricultural chemicals containing POPs etc. withdrawn from the warehouses etc. are also managed properly.

Results of stored agricultural chemicals survey

(In tons)

Prefecture	Number of burial sites	Amount of stored agricultural chemicals	Chemical						Remark
			Aldrin	Dieldrin	Endrin	DDT	BHC	Unknown	
Hokkaido	2	566.020	2.794	0.672	26.520	303.039	232.995		
Aomori									Ground storage: 46t
Iwate	1	75.300				19.000	56.000	0.300	
Miyagi	1	182.135	1.259	1.512	0.504	104.408	74.452		
Akita	2	111.000						111.000	
Yamagata	14	154.672	3.983	0.025	1.558	14.718	134.388		
Fukushima	1	191.000						191.000	
Ibaraki	4	65.900		1.900		7.950	55.850	0.200	
Chiba	1	6.000						6.000	
Kanagawa	2	73.000	11.000	13.500	0.000	17.500	30.000	1.000	
Yamanashi	1	6.000						6.000	
Nagano	11	128.000				8.460	8.250	111.290	
Shizuoka	1	39.100	3.800			15.300	17.700	2.300	Ground storage: 0.05t
Niigata	97	475.188	4.958	1.026	0.613	86.044	349.893	33.103	
Shiga	2	249.900				162.400	87.400	0.100	
Osaka	1	3.000					3.000		
Wakayama	1	14.569				5.920	6.049	2.600	
Tottori	19	153.414						153.414	
Okayama	1	454.800				92.200	343.300	19.300	
Yamaguchi	3	160.210						160.210	
Kagawa									Ground storage: 0.207t

Ehime	1	226.271	0.242	0.250	0.212	33.569	191.998		
Fukuoka	1	142.300				49.500	74.500	18.300	
Saga	2	28.196	0.000	0.000	0.042	8.214	19.940	0.000	
Kumamoto	2	83.384	23.766		0.065	0.604	58.949		
Kagoshima	1	64.000				9.000	55.000		
Okinawa	2	27.000	0.048	0.000	10.012	5.940	9.000	2.000	
Total	174	3680.359	51.850	18.885	39.076	943.766	1808.664	818.117	Ground storage: 46.257

(2) Disposal

Since hazardous materials, such as dioxins, are likely to be released if stored agricultural chemicals are inappropriately disposed of, it had been required to establish appropriate measures and to dispose of such stored agricultural chemicals. Thus, verification test of disposing agricultural chemicals containing POPs etc. were conducted and the following were confirmed as appropriate measures.

In 2004, a 5-year program was launched according to the “Technical Documents on Treatment of Agricultural Chemicals containing POPs” developed by the Waste Management and Recycling Department, Ministry of the Environment. Under this program, verified technologies have been put into practice to dispose of stored agricultural chemicals.

Verified waste decomposition method for agricultural chemicals containing POPs etc.	Name of technology corresponding to technology name used in the guidelines from the Technical Working Group of the Basel Convention	Description
Incineration	Hazard waste incineration	Incineration at about 1,000℃ or higher
BCD	Base-catalyzed decomposition	Hydrogen donor, carbon catalyst and alkali are added to organochlorinated compounds and heated at 300 to 500C with nitrogen gas at atmospheric pressure. Materials are decomposed by dechlorination.
Sodium dispersion	Alkali metal reduction	Organochlorinated compounds are dechlorinated in oil containing dispersed metallic sodium.
Subcritical water oxidation	Subcritical water oxidation	Organic compounds are decomposed by oxidative method in water at high temperature and high pressure in near-critical field.
Supercritical water oxidization	Super-critical water oxidation	Oxidative reaction is initiated in supercritical water to decompose organic matter into carbon dioxide, water and chloride.
Mechanochemical method	-	Organochlorinated compounds are detoxified at room temperature and atmosperic pressure by applying the process of connected compounds being activated chemically as they are pulverized in a ball mill.
GeoMelt	-	Organochlorinated compounds are decomposed by heat of about 2,000℃ generated by electricity through electrodes set on a product.

Vacuum heating decomposition	-	Agricultural chemicals contain POPs etc. contained in contaminated soil is decomposed as it is heated at 600 to 800℃ and low pressure (10^{-2} to10^{-3} Torr), while preventing the generation of dioxins.

Note: Name of technology corresponding to the technical guidelines from the Basel Convention has been revised from one of the Japanese edition in accordance with the technical guidelines adopted at the seventh meeting of the Conference of the Parties to the Basel Convention.

2. Obsolete chlordanes

(1) Identification

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

According to surveys conducted until 2003, about 49 tons (equivalent to 7 tons of chlordanes) of waste chlordane products, including insecticides for termite control, is in storage nationwide.

(2) Disposal

A test conducted by the Ministry of Agriculture, Forestry and Fisheries and the Ministry of the Environment verified several disposal methods for POPs contained in agricultural chemicals. As these methods can be also applied to obsolete chlordanes, disposal of obsolete chlordanes currently in storage will be promoted.

3. Dioxin-contaminated wastes

(1) Identification

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 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	

The Pollutant Release and Transfer Register (PRTR) was set up in 2003 under the Chemical Substances Reporting and Management Promotion Law. In FY2003, 3,054 grams of dioxins are estimated to have been transferred or buried after being carried in wastes, such as particulates and burnt residue.

The amounts of dioxins transferred or buried were not confirmed until 2002, when statistics were compiled 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.

(2) Disposal

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).

To meet this requirement, one of the following technologies should be used to decompose

dioxins:

Technology	Description
Fusion	Wastes are heated to melting temperature of 1,300℃ or above to decompose dioxins.
Incineration at high temperature	Dioxins are heated to decompose at a high temperature of about 1,100℃ in oxidized atmosphere.
Vapor-phase hydrogen reduction	Wastes are heated to 850℃ or above in anaerobic hydrogen atmosphere to reductively decompose and dechlorinate dioxins through reaction with hydrogen.
Reductive dechlorination	Heat (about 400℃) is added in oxygen-deleted atmosphere (by nitrogen substitution) to dechlorinate dioxins.
Super-critical water oxidation	The dissolving ability of super-critical water is utilized (at 374℃ and 22.1 MPa or more) to decompose dioxins.
Sodium dispersion	Dioxins are decomposed through reaction with metallic sodium particles dispersed in oil.
Photochemical splitting	Dioxins are dechlorinated to decompose by ultraviolet radiation and the oxidative ability of ozone.

After these treatments, waste can be lamdfilled 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 appropriate assistance.

4. Dioxin-containing agricultural chemicals

(1) Collection and sound management

The Ministry of Agriculture, Forestry and Fisheries has directed the pesticide manufacturer to collect the chloronitrophene (CNP), pentachlorophenol (PCP) and pentachloronitrophenol (PCNB) from farmers, because those agricultural chemicals were contaminated by dioxins. These agricultural chemicals have been strictly stored together with ones collected from the stage of the manufacture and distribution.

(2) Disposal

These agricultural chemicals will be appropriately disposed of by pesticide manufacturers in accordance with the Technical Documents on Treatment of waste agricultural chemicals containing POPs (Waste Management and Recycle Department, Ministry of the Environment) in the future.

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.

As of March 2005, three areas are designated as controlled areas, and Plans of Measures, including removal or detoxification of contaminated soil, are being prepared or already implemented.

Treatment of soil contaminated by dioxins often becomes a high cost. It is necessary to reduce the disposal costs while addressing the safety of contaminated soil treatment technologies. In this respect, verification surveys and evaluation of cleaning technologies are currently under way. In FY2003 and FY2004, the government will focus on the following contaminated soil treatment technologies:

Technology	Description
Combination of TPS and the GeoMelt method to detoxify dioxin-contaminated soil	Contaminated soil is heated at 400 to 600℃ under reduced pressure to vaporize and separate dioxins. Dioxins contained in waste gas are cleaned off water and recovered as polluted sludge (TPS). The recovered polluted sludge is vitrified by heat generated by electricity to decompose and detoxify dioxins (GeoMelt).
Combination of reduction/heating and sodium dispersion	Contaminated soil is heated at 550 to 600℃ in nitrogen atmosphere under reduced pressure to decompose dioxins (Reduction and heating). Undecomposed dioxins contained in waste gas are recovered in oil by oil cleaning and dechlorinated and detoxified through reaction with metallic sodium (Sodium dispersion).
Combination of indirect heated desorption and steam decomposition	Contaminated soil is indirectly heated to decompose and evaporate from soil (Indirect heated desorption). Evaporated dioxins are indirectly heated to decompose at about 1,000℃ for over 3 seconds in steam atmosphere (Steam decomposition).
Indirect thermal oxidization	Contaminated soil is indirectly heated to decompose through catalytic action of metal oxides and metal chlorides contained in the soil.
Combination of classification/washing and wet oxidation by radical	Contaminated soil is washed and classified to separate particles containing a high level of dioxins (Classification and washing). Contaminated soil slurry is heated under pressure. Dioxins are oxidized and decomposed by the oxidative power of OH radicals that are generated as oxidizing reagent is dissolved (Wet oxidation by radical).
TATT	Contaminated soil is indirectly heated at reduced pressure under a reduced pressure to decompose and detoxify dioxins.
Indirect thermal soil cleaning	Contaminated soil is indirectly heated under reductive condition to decompose and detoxify dioxins.
Dehalogenation by metallic sodium	Metallic sodium and a catalyst are added to water-deprived contaminated soil to dechlorinate and detoxify.

(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 was set up in July 2002 and went into force in September regarding contamination of bottom sediment in public waters.

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

Also since 1999 the Ministry of Land, Infrastructure and Transport has continually implemented dioxins surveys to analyze the contamination of water and bottom in first-class rivers and lakes, and then compiled the manual for constant monitoring of dioxins in rivers and lakes. 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, a dioxin survey was 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 measure 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, care should be taken about 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 and Transport has recently drafted in cooperation with academic experts an anti-dioxin manual for bottom sediment in rivers and lakes. In line with this manual, the river administrator is making efforts to establish measures to cope with dioxins in bottom sediment in public waters.

The Ministry of Land, Infrastructure and Transport 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 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.

Dredging operations at seaports will be carried out safely and smoothly on the basis of

the Technical Guidelines and the Data Book. At the same time, anti-dioxin measures for bottom sediment will be established in the near future as part of the seaport antipollution project.

2. Polychlorinated biphenyl（PCB）

(1) Antipollution measures for soil

The environmental quality standard for soil based on the Basic Environment Law and the Soil Contamination Countermeasures Law (Law No.53 of 2002) prescribe that PCBs not be detected in soil specimens. If soil is confirmed to contain PCBs, necessary measures must be taken, such as removal of contaminated soil.

One of the above-mentioned controlled areas was contaminated by coplanar PCB that originates in PCB.

(2) Antipollution measures for bottom sediment

For PCB-contaminated bottom sediment, the standard maximum value 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 1972 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 other 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 POPs 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 evaluated for degradability, accumulation, long-term toxicity on humans and toxicity to plants and animals. Evaluation of rxisting 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., these registrations 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 to prevent adverse effect on human health and environment. Moreover, the use of such agricultural chemicals can also be prohibited following Article 11. At present, the use and sale of the 21 agricultural chemicals, including nine pesticides designated under Stockholm Convention, are prohibited by the ministerial ordinance.

Item 3, Paragraph 2, Article 14 of the Pharmaceutical Affairs Law (Also note Article 83) stipulates that drugs etc. may be approved for marketing only after evaluation of their name, ingredients, composition, structure, dose, 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

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 10 groups of POPs except dioxins. It will also carry out surveys of these chemicals in human biological samples.

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 implement surveys on dioxins in 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:

(1) Ten groups of chemicals other than dioxins

(i) Chemicals to be surveyed

- ・PCB (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 and heptachlor

(ii) Mediums and sites to be surveyed

- ・ Water (38 sites, including major rivers, major lakes, seaports, etc.)
- ・ 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 (25 sites on bass, *hexagrammos otakii*, *acanthopagrus sivicolus*, *tribodon hakonensis*, blue mussels, blue sea mussels, starlings, *septifer virgatus*, and *larus crassirostris*)
- ・ Human biological samples (breast milk, cord blood)

(2) Dioxins

(i) Chemicals to be surveyed

PCDDs, PCDFs and coplanar PCBs

(ii) Media and sites to be surveyed

- Water (major rivers, major lakes, reservoirs, seaports; 2,126 sites in FY2003）
- Bottom sediment (major rivers, major lakes, reservoirs, seaports; 1,825 sites in FY2003)
- Air（general environment, areas surrounding sources of emission, roadsides; 913 sites in FY2003）
- Soil（general environment, areas surrounding sources of emission; 3,059 sites in FY2003）
- Organisms（wildlife, including black kites, *phalacrocorax carbo*, jungle crows, Sowerby's beaked whales, Indian porpoises, *apodemus speciosus*, raccoons and *macaca fuscata*; 85 samples in FY2002）
- 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

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 will cooperate 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 FY2003 concerning the management and reduction of chemical substances, 16 trainees were received and 3 experts were dispatched. Since FY2004 a research cooperation project with

China has been under way for the development and standardization of measurement system management tools etc. suitable to that country.

(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 prevention of the pollution of international waters and the protection of the ozone layer etc.

In the third replenishment of GEF, Japan has contributed 423 million dollars representing 18.5% of the Fund's total of 2.281 billion dollar on a pledging basis and Japan is the second largest donor after the US which has contributed 430 million dollars (21.9% of the total).

(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 future cooperative framework for understanding correctly the trends of POPs in the environment in the East Asia region.

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 keeps exchanging 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 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 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. 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) procedure for certain hazardous chemical substances and pesticides in international trade, was adopted at the Diplomatic Conference held in September 1998. 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 the POPs referred to in that Article.

The government keeps implementing these Conventions related to chemical management positively.

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.

The government keeps providing the information on POPs positively.

Pamphlets and brochures	POPs - persistent organic pollutants -
	Dioxins 2003(Japanese version)
	Dioxins 2003(English version) Toward the Sound Disposal of Polychlorinated Biphenyls(PCB) Wastes
Homepages	POPs ・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/new-page/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 on March 30, 2001) prescribing the basic policy for the promotion of science and technology for a period of 5 years from 2001 through 2005 has defined the environmental sciences as one of the priority areas and focused upon the technology to minimize risks from harmful chemical substances for human health and natural ecology as well as to evaluate and manage them. Based upon the Science and Technology Basic Plan, the Council for Science and Technology Policy has worked out the Sector-wise Promotion Strategy in September 2001 and selected five prioritized fields in the environmental sciences, which includes the Research Initiative on Chemical Substance Risk Management.

This Research Initiative is promoted within the inter-ministerial integrated research framework with the objective of developing tools for the comprehensive evaluation and management of risks from chemical substances such as POPs as well as developing technologies to reduce and minimize risks from chemical substances. This Research Initiative promotes the cooperative efforts among research and technological development projects by each ministry.

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 in the environment 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

Technologies enabling detection of trace amount of hazardous substances such as dioxins in the environment were developed. Its principle is to measure dioxins through the use of living organisms' high sensitive recognition functions with high sensitivity, high speed and low cost.

The development of multimedia models for POPs which take into account environmental factors peculiar to Japan and East Asia shall be facilitated in the future. Tools to detect with high sensitivity the concentration level of agricultural chemicals falling within the purview of POPs shall be developed.

Furthermore, techniques for analysis and evaluation of dioxins shall be established through researches on new measurement methods, index of their effects on human health, their endocrine disruption, survey on their global pollution and prediction and evaluation of their dynamics as well as new substances similar to dioxins such as brominated dioxins etc.

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

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

(3) Technologies for release reduction and detoxification

The technology which decomposes and neutralizes low degradability chemicals such as dioxins and PCB by using supercritical fluids was developed.

In order to expand the scope of application for bioprocess and to enhance its efficiency in the so-called venous industry including one for decomposing chemical substances with low degradability such as dioxins, the functions and mechanisms of microbes involved in biodegradation and disposal process will be analyzed and thus their management technology will be developed.

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

Status of general environment (Tables and Figures)

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

Table 1: Status of monitoring POPs

		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
Air	Aldrin/Endrin																													B2	B2
	Dieldrin																													B2	B2
	Chlordanes													B1																B2	B2
	DDTs																													B2	B2
	Heptachlor													B1																B2	B2
	Toxaphene/Mirex																														B2
	HCB																					B1				E	B1			B2	B2
	PCBs																								B1		B1	B1	B1	B2	B2
	PCDD/DFs													O	O	O	O	O	O	O	O	O	O	O	A	A	A	D,A	D,A	D,A	D,A
Water	Aldrin/Endrin																									E				B2	B2
	Dieldrin													B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2
	Heptachlor									B1																				B2	B2
	Toxaphene/Mirex										B1																				B2
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2
	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
	PCDD/DFs																									O	O	D	D	D	D
Soil	PCDD/DFs																									O	O	D	D	D	D
Bottom Sediment	Aldrin/Endrin																									E				B2	B2
	Dieldrin													B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2
	Heptachlor									B1																				B2	B2
	Toxaphene/Mirex										B1																				B2
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2
	PCBs																							B1	B1			B1,E	B1	B2	B2
	PCDD/DFs												O	O	O	O	B	B	B	B	B	B	B	B	B	O	O	D	D	D	D
Wildlife	Aldrin/Endrin					B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1					E				B2	B2
	Dieldrin					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
	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
	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
	Heptachlor									B1																				B2	B2
	Toxaphene/Mirex																														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
	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
	PCDD/DFs												O	O	O	O	B1	B1	B1	B1	B1	B1	B1	B1	B1	O	O	O,E	O	O	O

B1:Survey on the actual condition of chemical substances in the environment (until 2001), B2:Survey on the actual condition of chemical substances in the environment (after 2002), D:Survey under the Law concerning Special Measures against Dioxins, E:Survey on the environmental endocrine disruptors, W:Survey under the Water Pollution Control Law, A:The air pollutants monitoring, O:Other survey

* Details 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
* 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/index2.html

Table 2: Analytical method and minimum detectable concentration for POPs

Compound	Air			Water			
Drins	B2(0.70 pg/m^3)*1			B2(0.3 pg/L)*1	B1(10ng/L)*1	E(25～50ng/L)	
Chlordane	B2(0.29 pg/m^3)*4			B2(2 pg/L)*4	B1(10ng/L)*4	E(25～50ng/L)	
DDT	B2(0.046 pg/m^3)*5			B2(0.9 pg/L)*5	B1(10ng/L)*5	E(25～50ng/L)	
Heptachlor	B2(0.085 pg/m^3)			B2(0.5 pg/L)			
HCB	B2(0.78pg/m^3)	B1(0.013～1ng/m3)	E	B2(2 pg/L)	B1(10ng/L)	E(25～50ng/L)	
PCB	B2(0.0043～1.1pg/m^3)	B1(0.0004～2 pg/m^3)		B2(0.07～2 pg/L)	B1(0.03～2 pg/L)	E(10ng/L*2)	W(-*3)
PCDD/DFs	D			D			

Compound	Soil	Bottom Sediment			Wildlife		
Drins		B2(2 pg/g dry)	B1(1ng/g dry)	E(10～20ng/g wet)	B2(1.6 pg/g wet)	B1(1ng/g wet)	E(10～30ng/g wet)
Chlordane		B2(2 pg/g dry)*4	B1(1ng/g dry)*4	E(1～2ng/g wet)	B2(2.4 pg/g wet)*4	B1(1ng/g wet)*4	E(1～30ng/g wet)
DDT		B2(0.4 pg/g dry)*5	B1(1ng/g dry)*5	E(5ng/g wet)	B2(3.5 pg/g wet)*5	B1(1ng/g wet)*5	E(5ng/g wet)
Heptachlor		B2(1 pg/g dry)			B2(2.2 pg/g wet)		
HCB		B2(2 pg/g dry)	B1(1ng/g dry)	E	B2(7.5 pg/g wet)	B1(1ng/g wet)	E
PCB		B2(0.2～2 pg/g dry)	B1(0.03～2 pg/g dry)	E(10pg/g wet*2)	B2(0.69～3.7 pg/g wet)	B1(10ng/g wet)	E
PCDD/DFs	D	B	D		B	D	

GC/ECD(or GC/MS(low-resolution))
GC/MS(low-resolution)
GC/MS(high-resolution)
*1:Dieldrin
*2:detection limit of each isomers
*3:minimum determination level:0.0005mg/L
*4:trans-Chlordane
*5:p,p'-DDT

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 3: 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
Air		all sites		average	0.55	0.23	0.18	0.15	0.13	0.093	0.068
				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
				(number of sites)	(68)	(458)	(463)	(920)	(979)	(966)	(913)
			in general	average	0.55	0.23	0.18	0.14	0.14	0.093	0.064
				(number of sites)	(63)	(381)	(353)	(705)	(762)	(731)	(691)
			vicinity of sources	average	0.58	0.20	0.18	0.15	0.13	0.092	0.078
				(number of sites)	(2)	(61)	(96)	(189)	(190)	(206)	(188)
			along roads	average	0.47	0.19	0.23	0.17	0.16	0.091	0.076
				(number of sites)	(3)	(16)	(14)	(26)	(27)	(29)	(34)
Public Water	Water	all sites		average	—	0.50	0.24	0.31	0.25	0.24	0.24
				concentration range	—	0.065 ～13	0.054 ～14	0.012 ～48	0.0028 ～27	0.010 ～2.7	0.020 ～11
				(number of sites)	—	(204)	(568)	(2,116)	(2,213)	(2,207)	(2,126)
			River	average	—	—	0.40	0.36	0.28	0.29	0.27
				(number of sites)	—	—	(186)	(1,612)	(1,674)	(1,663)	(1,615)
			Lakes and Reservoirs	average	—	—	0.25	0.22	0.21	0.18	0.20
				(number of sites)	—	—	(63)	(104)	(95)	(102)	(99)
			Sea area	average	—	—	0.14	0.13	0.13	0.092	0.094
				(number of sites)	—	—	(319)	(400)	(444)	(442)	(412)
	Bottom Sediment	all sites		average	—	8.3	5.4	9.6	8.5	9.8	7.4
				concentration range	—	0.10 ～260	0.066 ～230	0.0011 ～1,400	0.012 ～540	0.0087 ～640	0.057 ～420
				(number of sites)	—	(205)	(542)	(1,836)	(1,813)	(1,784)	(1,825)
			River	average	—	—	5.0	9.2	7.3	8.5	6.3
				(number of sites)	—	—	(171)	(1,367)	(1,360)	(1,338)	(1,377)
			Lakes and Reservoirs	average	—	—	9.8	11	18	13	11
				(number of sites)	—	—	(52)	(102)	(85)	(86)	(89)
			Sea area	average	—	—	4.9	11	11	14	11
				(number of sites)	—	—	(319)	(367)	(368)	(360)	(359)
Ground Water				average	—	0.17	0.096	0.092	0.074	0.066	0.059
				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
				(number of sites)	—	(188)	(296)	(1,479)	(1,473)	(1,310)	(1,200)
Soil		Total		average	—	6.5	—	6.9	6.2	3.8	4.4
				concentration range	—	0.0015 ～61	—	0 ～1,200	0 ～4,600	0 ～250	0 ～1,400
				(number of sites)	—	(286)	—	(3,031)	(3,735)	(3,300)	(3,059)
			in general	average	—	—	—	4.6	3.2	3.4	2.6
				(number of sites)	—	—	—	(1,942)	(2,313)	(2,282)	(2,128)
			vicinity of sources	average	—	—	—	11	11	4.7	8.5
				(number of sites)	—	—	—	(1,089)	(1,422)	(1,018)	(931)

(Air)

Note1 This is the result of air environmental monitor investigation result of the execution of the governments under the Air Pollution Control Law (The investigation result of old Environment Agency is included) in fiscal year 1999 from 1997.

Note2 It limits to the sites surveyed twice or more a year including the investigation in summer and winter.

Note3 I-TEF(1988) had been used for the calculation of toxicity equivalent before fiscal year 1998 and WHO-TEF(1998) has been used after fiscal year 1999.

Note4 As a rule, before fiscal year 1998, when the concentration measurement of each isomer is less than minimum determination level of detection, the toxicity equivalent has been calculated as zero.

After fiscal year 1999, when the concentration measurement of each isomer is less than minimum determination level of detection 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)

Note1 WHO-TEF(1998) has been used for the calculation of toxicity equivalent.

Note2 When the concentration measurement of each isomer is less than minimum determination level of detection 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)

Note1 WHO-TEF(1998) has been used for the calculation of toxicity equivalent.

Note2 When the concentration measurement of each isomer is less than minimum determination level of detect, the toxicity equivalent has been calculated as zero.

Note3 The survey has been conducting for about 5 years. Number of survey sites for each year is not same.

Table4: PCB measurement under FY2003 regular-observation of public waters quality

	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	1729	0	122	0	520	0	2371	0

Table 5: Geographical distribution of HCB concentrations in air

unit : ng/m^3

name of sites	concentrations
Hokkaido Institute of Environmental Sciences	0.10
Ichihara City	0.15
Kanagawa Environmental Research Center	0.26
Nagano Environmental Conservation Research Institute	0.25
Mt. Norikuradake	0.071
Mie Public Health and Environment Research Institute	0.12
Kyoto Public Health and Environment Research Institute	0.51
Hyogo Environmental Sciences Research Institute	0.075
Yamaguchi Public Health and Environment Research Center	0.12
Kagawa Pref. Takamatu Government Office Building	0.10
Omuta City Hall	0.51
Nagoya City	0.14
Hiroshima City	0.084

(the Survey on Development of an Analytic Method for Chemicals in 1999)

		concentration
sources	Akita city	0.18
	Sendai City Aoba-ku	0.27
	Fukushima Pref. Sukagawa City	0.37
	Saitama Pref. Fujimi City	0.30
	Fukui Pref. Mikuni-cho	0.23
	Tokyo metropolitan area. Machida City	0.29
	Mie Pref. Suzuka City	0.15
	Osaka Pref. Higashiosaka City	0.30
	Tokushima City	0.22
	Omuta City	0.21
residential area	Tsuruoka City	0.34
	Fukui City	0.25
	Nagoya City Chikusa-ku	0.19
	Fukuoka City Jonan-ku	0.26
suburbs	Hachinohe City	0.20
	Tsukuba City	0.40
	Wakayama City	0.21
	Karatsu City	0.22
	Tokyo metropolitan area. Minato-ku	0.54
	(daily fluctuation)	0.43
		0.32
		0.26
		0.25
		0.20
		0.27
	average	0.32
	Osaka Pref. Higashinari-ku	0.32
	(daily fluctuation)	0.30
		0.29
		0.38
		0.32
		0.26
		0.29
	average	0.31

(the Environmental Survey on Endocrine Disruptors in 1999)

Table 6: Concentration of POPs in wildlife (FY2000 wildlife influence survey of endocrine disrupters)

（concentration is a geometric mean：ng/g wet）

species	Number	PCB	HCB	Chlordane		Oxy-chlordane	trans-Nonachlor	DDT		DDE and DDD				Dieldrin	Heptachlor epoxide
				cis-Chlordane	trans-Chlordane			o,p'-DDT	p,p'-DDT	o,p'-DDE	p,p'-DDE	o,p'-DDD	p,p'-DDD		
Black Kite	20	483	2.2	7.8	1.5	8.5	21.2				83		5.2	23.0	2.7
Osprey	1	97	3.3	0.3	2.1	1.1	0.9		2.0		84		17.0	7.6	1.0
Northern Goshawk	6	119	2.6			26.5	6.5				732		7.8	29.5	16.7
Japanese Sparrowhawk	1	700	7.2	0.3		43.0	42.0		31.0		5900		1700		8.8
Sparrowhawk	1	500	11.0		2.9	22.0	15.0				530			11.0	
Eastern Marsh Harrier	3	881	11.0	15.2	9.6	39.3	42.2		5.4		743		22.1	39.3	10.8
Peregrine Falcon	2	638	22.4	0.5	5.0	24.0	7.1		1.8		472		2.2		8.0
Common Kestrel	4	470	3.3			74.5					312				
Owl	2	15	0.5			3.3					14				2.2
Collared scops owl	4	47				12.0					28				
Hodgson's hawk eagle egg	4	1435	3.2	5.2	31.8	147.0	99.1		2.7		1094		4.4		38.0
Pergrine falcon egg	2	417	7.6	0.2	13.4	70.9	6.0				688		1.8		20.6

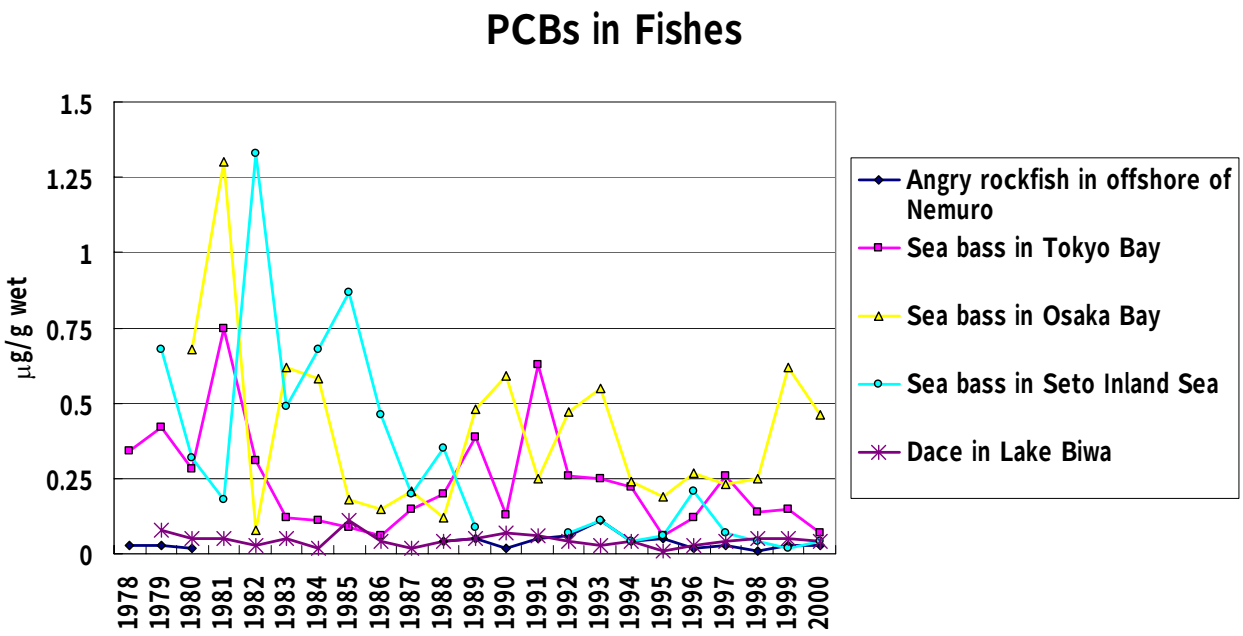

Figure 1: Annual changes in PCB concentration in fish specimens

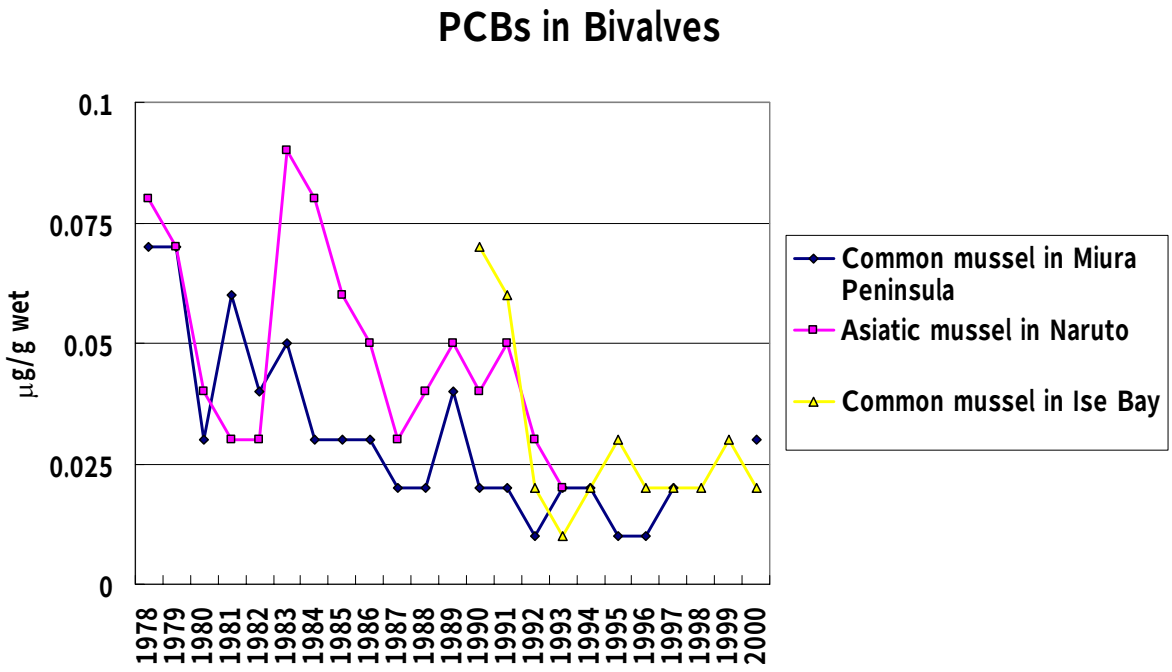

Figure 2: Annual changes in PCB concentration in bivalve specimens

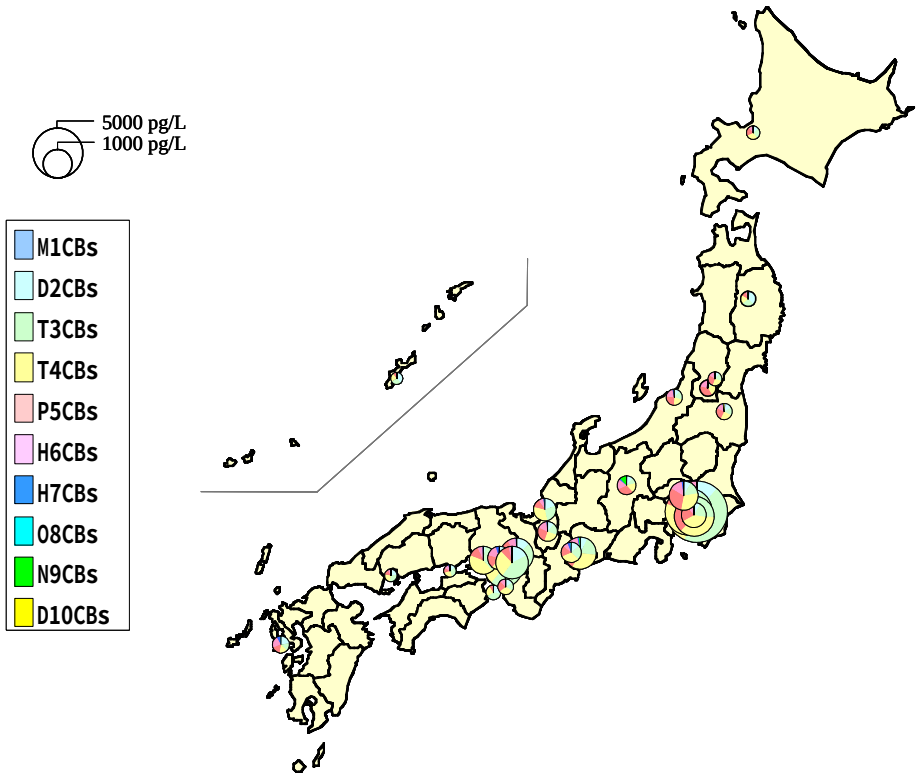

Figure 3: Measuring sites and concentration for PCB in water and concentration of analogues (2001)

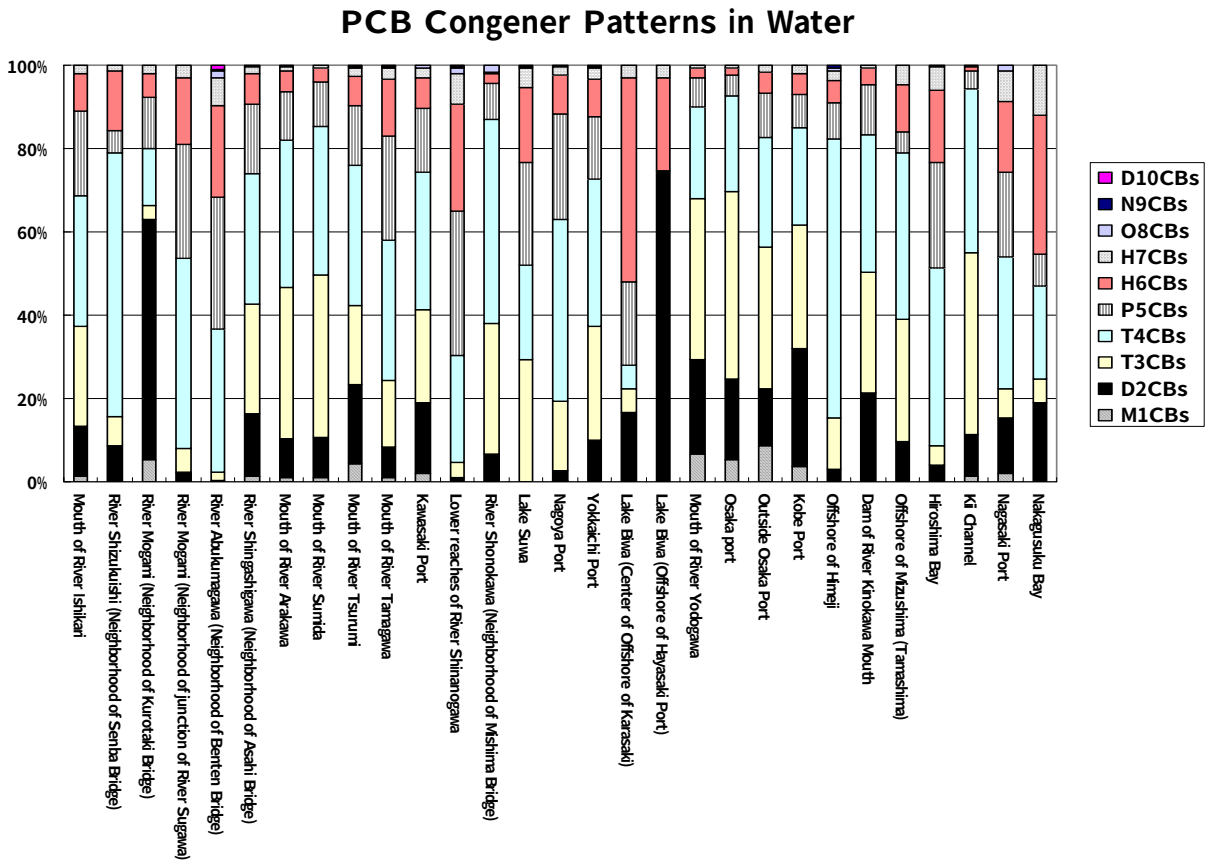

Figure 4: Ratio by site of analogues in PCB concentration in water (2001)

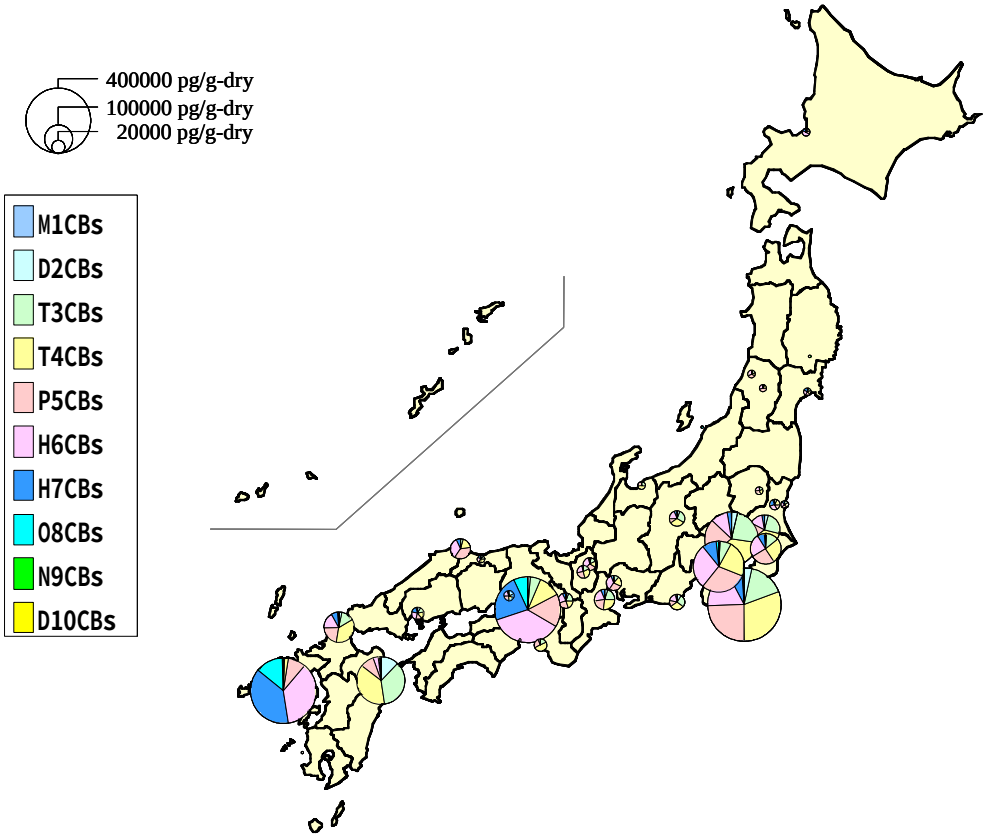

Figure 5: Measuring sites and concentration for PCB in bottom sediment and distribution of analogues (2001)

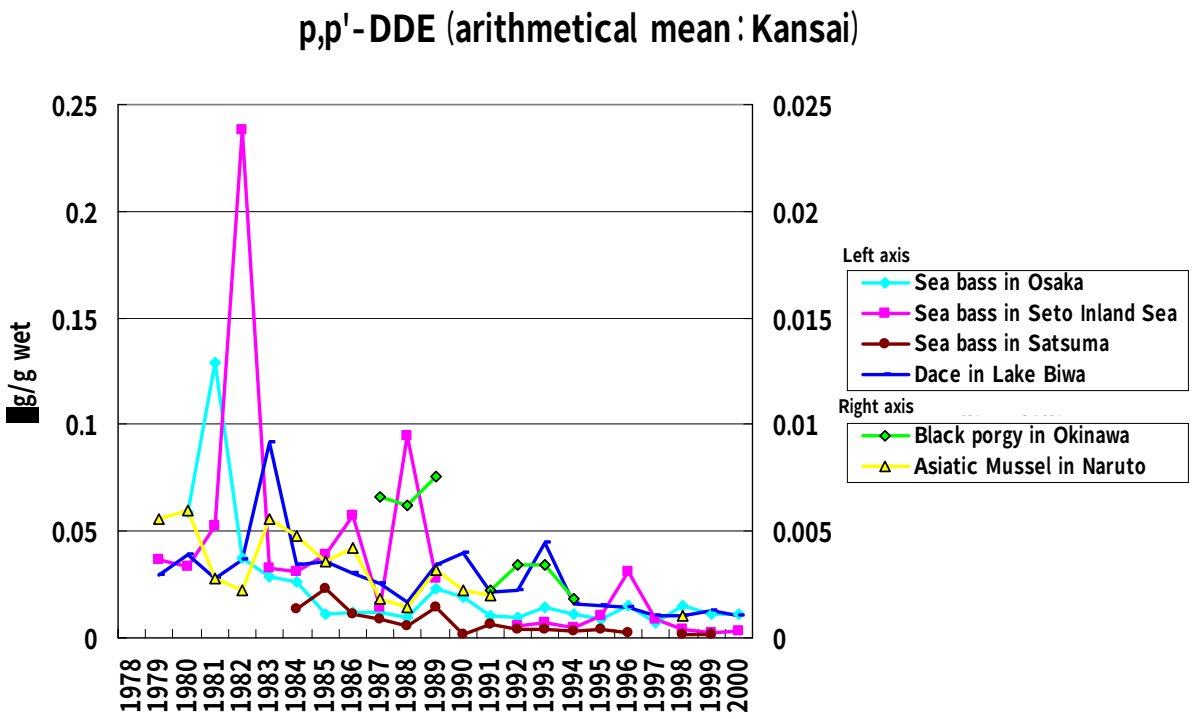

Figure 6: Annual changes in p,p'-DDE concentration in fish and shellfish in western Japan

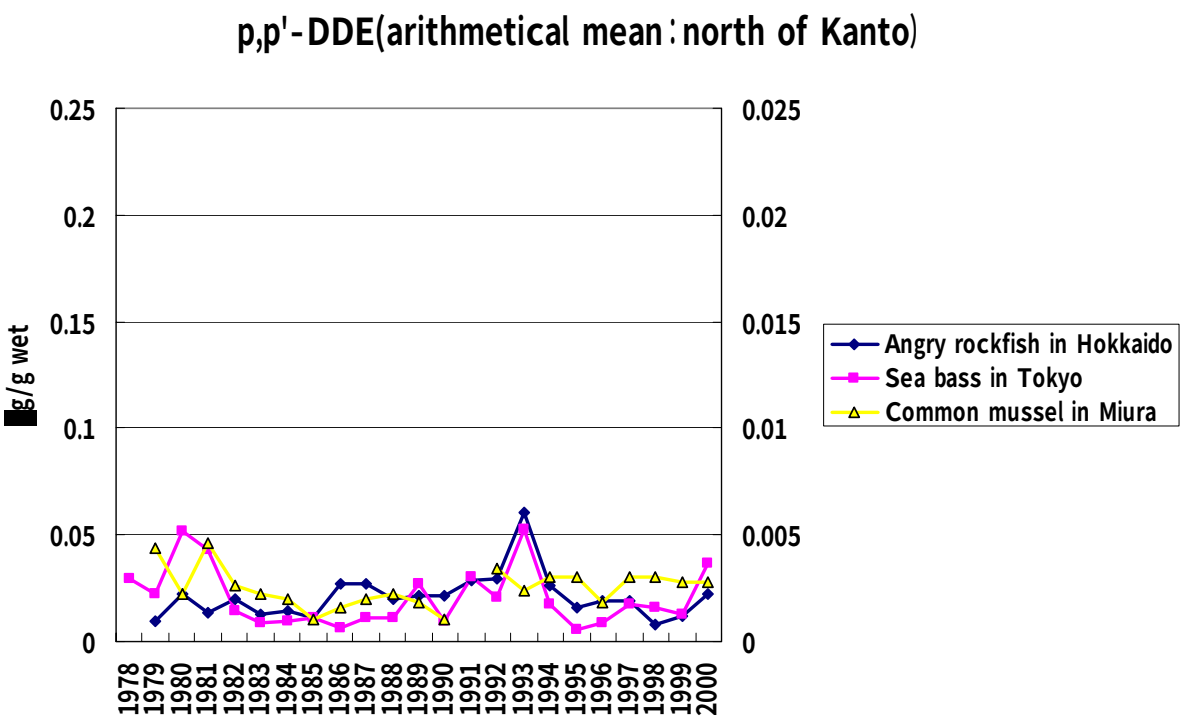

Figure 7: Annual changes in p,p'-DDE concentration in fish and shellfish in eastern Japan

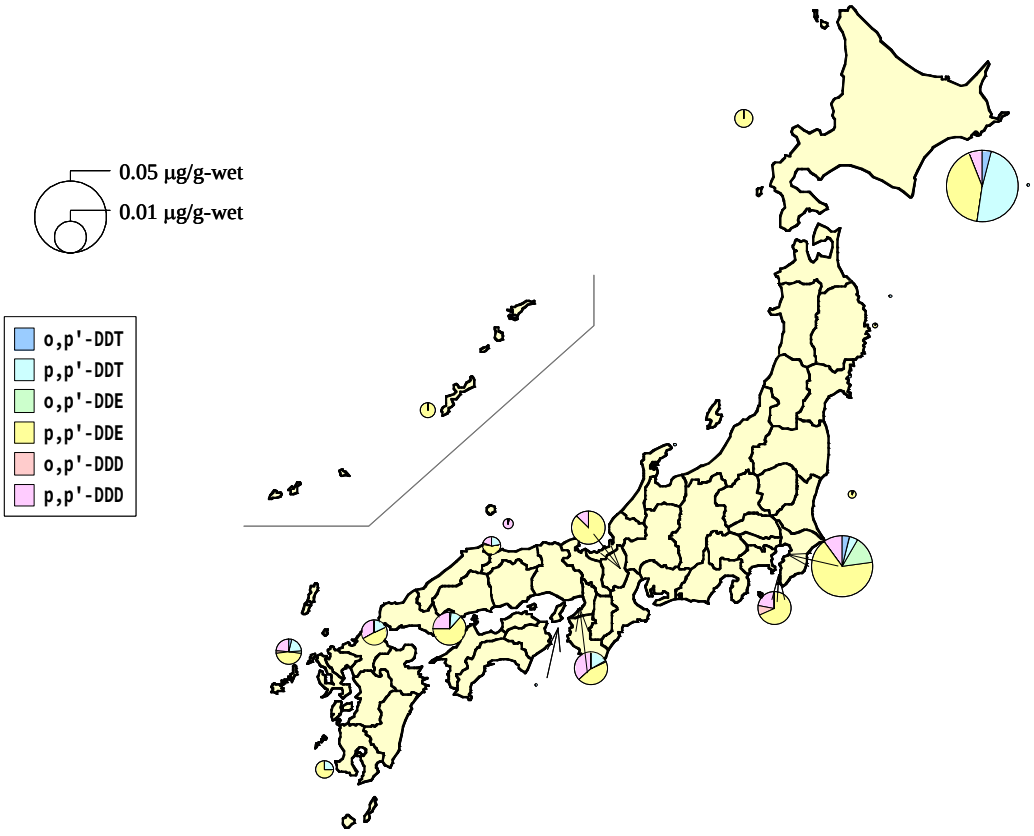

Figure 8: Distribution of DDT concentrations of in biological specimens (2001)

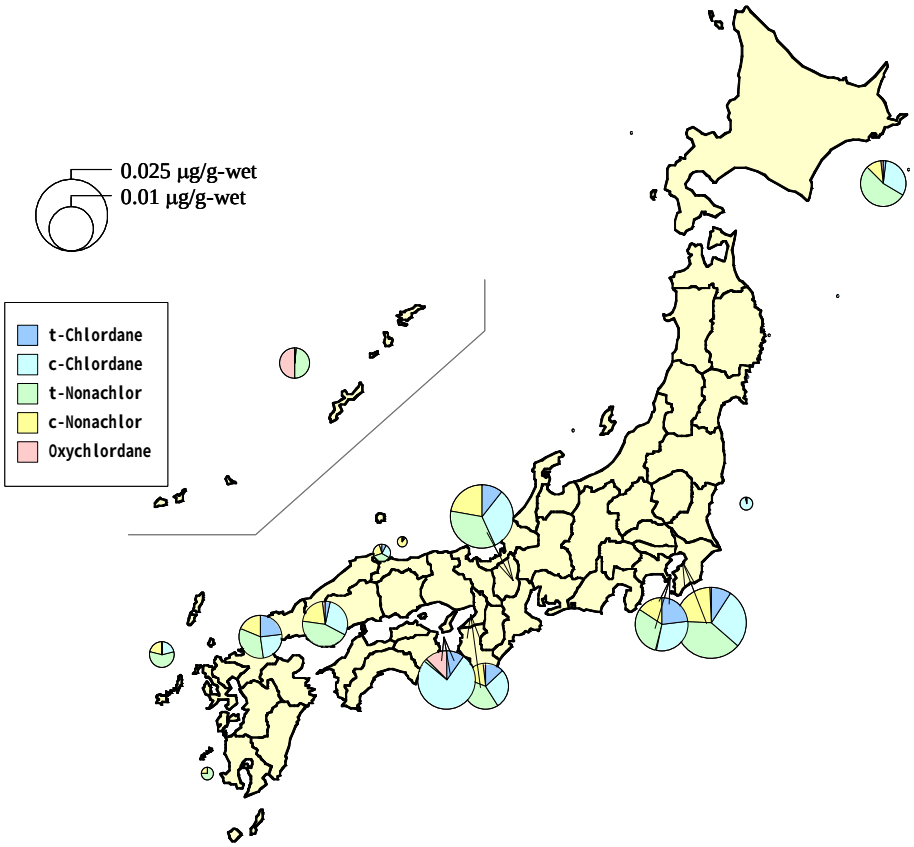

Figure 9: Distribution of chlordane concentrations in biological specimens (2001)

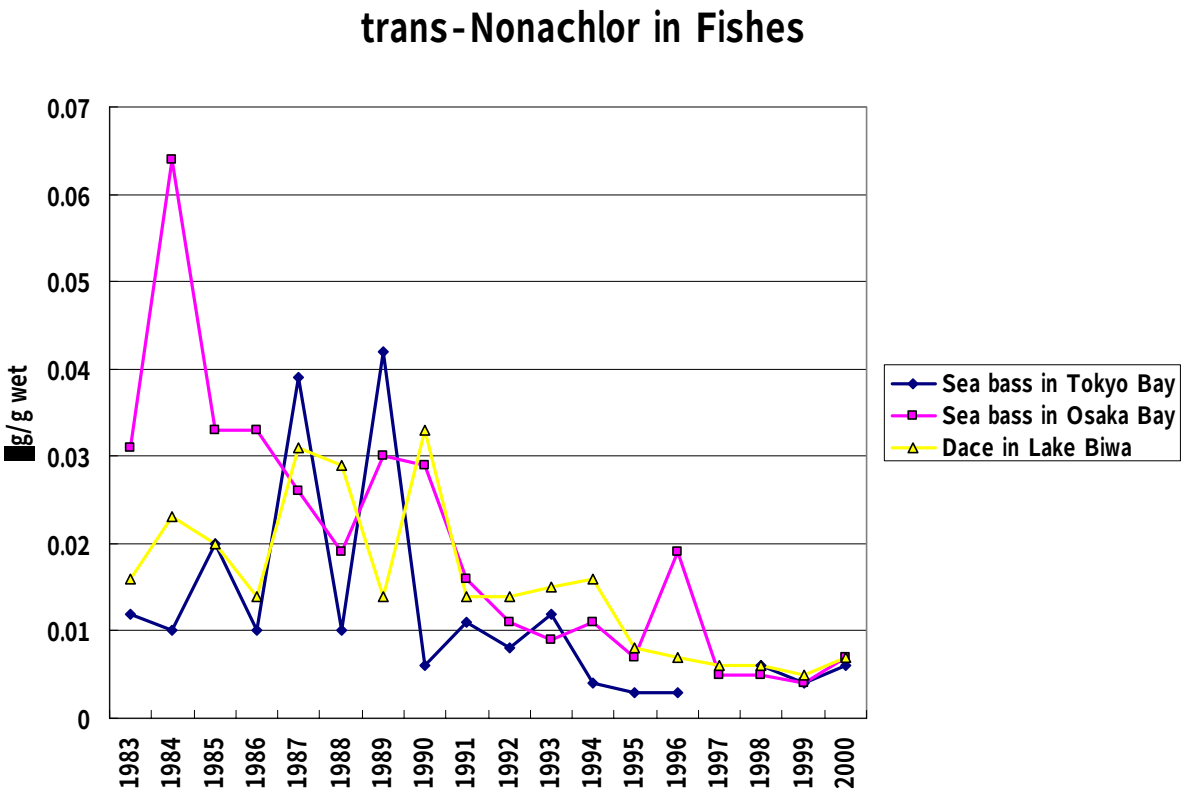

Figure 10: Annual changes trans-chlordane concentration in fish specimens

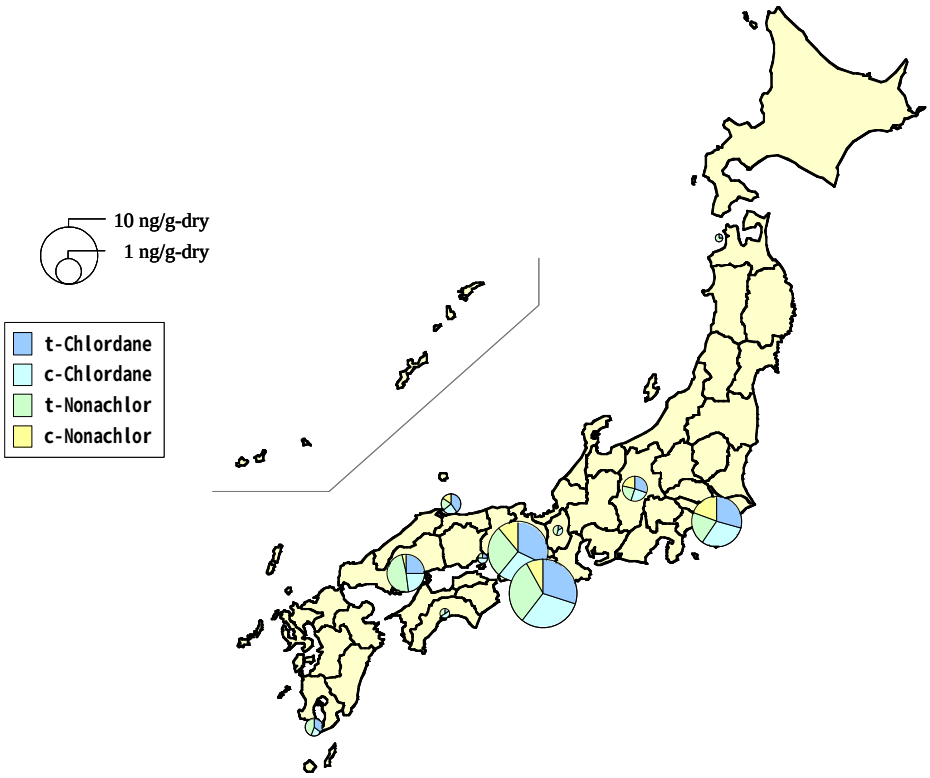

Figure 11: Distribution of chlordane concentrations in bottom sediment specimens (2001)

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

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

As of the end of FY2010, reduction targets of the estimated amounts of dioxins emissions, categorized by fields of business activities in Japan, shall be as follows:

(WHO-TEF (1998))

Field of business activities	Reduction targets (g-TEQ/year)	(Reference) Estimated amounts of dioxins emissions	
		Total emissions in 1997 (g-TEQ/year)	Total emissions in 2003 (g-TEQ/year)
1 Fields of waste disposal	164~189	7,205~7,658 "Water"5.3	219~244 "Water"0.60
(1) Municipal waste incinerators	51	5,000 "Water"0.044	71 "Water"0.004
(2) Industrial waste incinerators	50	1,505 "Water"5.3	75 "Water"0.60
(3) Small-scale waste incinerators	63~88	700~1,153	73~98
2 Fields of industry	146	470 "Water"6.3	149 "Water"0.93
(1) Electric steel-making furnaces	80.3	229	80.3
(2) Sintering facilities for steel industry	35.7	135	35.7
(3) Facilities for recovering zinc (Roasting furnaces, Sintering furnaces, Blast furnaces, Melting furnaces and Drying furnaces)	5.5	47.4 "Water"0.0036	5.5 "Water"0.0066
(4) Facilities for manufacturing aluminum base alloy (Roasting furnaces, Melting furnaces and dry kilns)	14.3	31.0 "Water"0.34	17.4 "Water"0.029
(5) Facilities for recovering copper	0.048	0.053	—
(6) Pulping process with bleaching	0.46	0.74 "Water"0.74	0.46 "Water"0.46

(7) Other facilities	9.9	26.5 “Water”5.2	9.9 “Water”0.44
3 Others	4.4~7.7	4.8~7.4 “Water”1.2	4.4~7.3 “Water”0.56
Total	315~343	7,680~8,135 “Water”12.8	372~400 “Water”2.1

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: The “total” reduction target is set at 95.8 to 95.9% less than the estimated amounts of dioxins emissions in 1997 and at 14.3 to 15.5% less than the estimated values of dioxins releases in 2003.

Note 3: “3. Others” includes crematoria, cigarette smoke, exhaust emissions from motor vehicles, sewage disposal facilities, and waste disposal sites. The increase in emissions under this column results from crematoria because of increasing deaths due to the elder society.

Note 4: “Water” in the table means amount emitted into water as part of emissions.

Note 5: The hyphen (-) in the table means that there was no record of operation in the year.

Note 6: Ranges in the columns result from different estimation methods.

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.

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.

(6) Others

As provided in the Waste Disposal and Public Cleansing Law (Law No.137 of 1970, hereinafter referred as to "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.

2. Management of dioxins

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 acknowledge 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 for the management of chemical substances stipulated in Article 3 of the same law, and shall also make efforts to 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 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, according to the Basic Plan for Establishing a Sound Material-Cycle Society (March 2003, Ministry of the Environment Notification No.28) formulated pursuant to Article 15 of the Recycling Law, the national government shall further promote the reduction etc. of wastes based on the 3R(Reduce, Reuse, and Recycle) Initiative

under “Science and Technology for Sustainable Development: 3R action plan and Progress on Implementation,” which was 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 provisions 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 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. related to its office work and its projects (National Government Action Plan; Ministry of Environment Notification No.47, July 2002), and the plan on measures for the local public authorities to implement in order to restrict green house gas emission etc. related to their office work and their projects (Local Government Action Plan).

(2) Enhancement of environmental education/learning

The national government shall promote a wide range of integrated environmental education/learning, designed for promoting the reduction of waste, including controlling waste discharges and promoting recycling, and exchanges of personnel and information between the public sector and the private sector under the Recycling Law. The national government shall promote the infrastructure building to enhance the supply and 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 at schools, within family, and in local communities 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 for 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 ensure the implementation of measures for wastes under the Waste Management Law and 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.

In line with reinforcement of dioxins emission controls, the national government shall

provide financial assistance to local public authorities to facilitate dismantling and disposal of decommissioned general waste incinerators, and encouraging the effective re-use of such sites.

(2) Promotion of measures against unregulated sources etc.

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 emission reduction measures, taking into consideration the latest knowledge of emissions and the draft guidelines on Best Available Techniques (BAT) and the Provisional guidance on Best Environmental Practices (BEP) (hereafter called “draft BAT and BEP guidelines” *) 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 draft BAT and BEP guidelines, and take appropriate measures under the law for ensuring the use of BAT.

Note*: Refers to the draft BAT and BEP guidelines submitted to the Conference of the Parties to the Stockholm Convention at its first session. If this draft is officially adopted at the Conference of the Parties at its third session, necessary measures shall be taken in line with its content.

(3) Promotion of financial and technical assistance to local public authorities for their municipal waste incinerators and promotion of proper installation of such incinerators and promotion of upgrading equipment installed in industrial waste incinerators

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. With regard to industrial waste incinerators, the national

government shall install model incinerators by providing financial assistance for improvement in waste disposal centers, and at the same time reinforce the sophistication of facilities under loan programs at government-run financial institutions etc.

Under a wide-area waste management program developed to reduce releases of dioxins from waste disposal process, the prefectural governments shall provide advice to municipal governments to implement the program at the earliest feasible time.

(4) Assistance to equipment investments required for emission reduction measures

The national government shall provide financial and technical assistance to those who reduce emissions of dioxins for their capital investments made for this purpose.

3. Report of dioxins emissions etc.

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

The national government shall annually compile and publish an emission inventory of dioxins in waste incinerators etc. by sources and by media.

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, organisms, human bodies, workplaces, 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 introduce quick and inexpensive simplified analytical methods to appropriate fields in a proactive manner and promote the development of such methods.

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.

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

(WHO-TEF（1998))

Source of dioxins emissions	Total amount of dioxins emission (g-TEQ/year)						
	1997	1998	1999	2000	2001	2002	2003
1 Fields of waste disposal	7,205～7,658	3,355～3,808	2,562～2,893	2,121～2,252	1,689～1,801	748～771	219～244
"Water"	5.3	5.3	5.3	2.5	1.5	0.87	0.60
General waste incinerators	5,000	1,550	1,350	1,019	812	370	71
"Water"	0.044	0.044	0.035	0.035	0.019	0.008	0.004
Industrial waste incinerators	1,505	1,105	695	558	535	266	75
"Water"	5.3	5.3	5.3	2.5	1.5	0.86	0.60
Small-scale waste incinerators	700～1,153	700～1,153	517～848	544～675	342～454	112～135	73～98
2 Fields of industry	470	335	306	268	205	189	149
"Water"	6.3	5.8	5.8	5.0	1.8	1.2	0.93
Electric steel-making furnaces	229	140	142	131	95.3	94.8	80.3
Sintering facilities for steel industry	135	114	101	69.8	65.0	51.1	35.7
Facilities for recovering zinc	47.4	25.4	21.8	26.5	9.2	14.7	5.5
"Water"	0.0036	0.0036	0.0036	0.0036	0.0036	0.0026	0.0066
Facilities for manufacturing aluminum base alloy	31.0	28.8	23.1	22.2	19.7	16.3	17.4
"Water"	0.34	0.068	0.093	0.056	0.082	0.024	0.029
Facilities for recovering copper	0.053	0.053	0.048	0.038	0.013	0.088	—
Pulping process with bleaching	0.74	0.71	0.74	0.73	0.90	0.65	0.46
"Water"	0.74	0.71	0.74	0.73	0.90	0.65	0.46
Other facilities	26.5	25.6	17.8	17.9	15.3	11.0	9.9
"Water"	5.2	5.0	5.0	4.2	0.85	0.52	0.44
3 Others	4.8～7.4	4.9～7.6	4.9～7.7	4.9～7.6	4.7～7.5	4.3～7.2	4.4～7.3
"Water"	1.2	1.2	1.2	1.2	1.0	0.53	0.56
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
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
Exhaust emissions from motor vehicles	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Sewage disposal facilities	1.1	1.1	1.1	1.1	0.99	0.51	0.54
"Water"	1.1	1.1	1.1	1.1	0.99	0.51	0.54
waste disposal sites	0.093	0.093	0.093	0.056	0.027	0.021	0.020
"Water"	0.093	0.093	0.093	0.056	0.027	0.021	0.020
Total	7,680～8,135	3,695～4,151	2,874～3,208	2,394～2,527	1,899～2,013	941～967	372～400
"Water"	12.8	12.3	12.4	8.7	4.4	2.6	2.1

Note: For the meaning of symbols and units used in this table, see the notes and remarks Table 1 in this plan.