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

Modified in October 2016

The initial National Implementation Plan was endorsed by the "Council of Ministers for Global Environment Conversation" on 24 June 2005, and the revised plan was approved by the "Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants" on 7 August 2012. The revision was made in accordance with Article 7 (Implementation plans) of the Stockholm Convention, the guidance in decision SC-1/12 (Annex, II 7) and the process shown in decision SC-2/7 (Annex, Step 7) of the Conference of the Parties, and this revised plan was endorsed by the "Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants" on 6 October 2016.

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Chapter 1 Introduction

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

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

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

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

The NIP was revised to reflect the addition of hexabromocyclododecane to the Annex at the Sixth Meeting of the Conference of the Parties held in April to May 2013, and its entry into force from 26 November 2014. This revision also includes pentachlorophenol and its salts and esters, polychlorinated naphthalenes, and hexachlorobutadiene, which were adopted to be listed in the Annexes at the Seventh Meeting of the Conference of the Parties held in May 2015.

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

This document was developed in reference to the draft guidance document for developing a national implementation plan for the Stockholm Convention, which was revised on March 2014 under decision SC-7/10 of the Conference of the Parties.

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

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

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

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

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

On 17 February 2004, the fiftieth instrument of ratification, acceptance, approval or accession to become a Party to the Stockholm Convention was submitted and the Stockholm Convention entered into force on 17 May 2004. As of May 2016, 179 countries including Japan and the European Union (EU) are the contracting parties to the Convention.

Section 2 Historical Background of POPs issues in Japan

In the past, crops, water and soil contaminated with high residue level of agricultural

chemicals such as DDTs, aldrin and dieldrin 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 residues 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. However, dieldrin and chlordane were also used as insecticides for termite control raising concerns for environmental pollution.

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

PCBs, which possess chemical stability, insular characteristics and incombustibility, have been used for a wide range of purposes including electrical insulation oil and heating medium for transformers and capacitors. However, ever since 1966, it has become increasingly apparent that PCBs contaminate the environment as exemplified in the PCBs detected in fish and birds worldwide. In Japan, in 1968, the PCBs used as heating medium in the manufacturing process of cooking oil had contaminated the product and caused health hazards (the Kanemi Cooking Oil Health Hazards Incident). Subsequently, PCBs were detected in various organisms and breast milk and PCBs contamination became a major social issue. Given this situation, the production of PCBs ceased since 1972 and the Chemical Substances Control Law was enacted in 1973. Under the law, a framework was created to evaluate chemical substances like PCBs in advance, which resist degradation in the environment (persistent), bioaccumulate in the bodies of living organisms (bioaccumulative) and are likely to be hazardous to the health of human beings in cases of continuous intake, and to regulate production, import and use of chemicals to prevent 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, in addition to chemical substances which are persistent, bioaccumulative and may be hazardous to the health of human beings in cases of continuous intake.

Moreover, there were several moves to establish PCB disposal facilities under the initiative of the private sector in order to dispose of PCBs already produced. However, such moves failed to ensure understanding and consent from local communities, and much of the PCBs remained as stockpiles 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 PCBs might contaminate the environment. Thus, in June 2001, the Law concerning Special Measures against PCB Wastes (Law No.65 of 2001, hereafter referred to as the PCB Special Measures Law) was enacted to obligate entities 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, in order to facilitate the sure and correct treatment of PCB wastes.

The environmental issues 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, rivers, lakes, sea waters and aquatic organisms was initiated in 1985, and in the ambient air 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, public concern heightened on 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 various facilities, introducing enhanced regulation on waste disposal and conducting investigations on the status of contamination and taking measures against contaminated soil and other matters. Now these measures are implemented under the Law.

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

In January 2003, Inter-Ministerial General Directors' Meeting on the Stockholm Convention on Persistent Organic Pollutants and its Steering Committee were established and these started their work for developing the NIP.

After the Inter-Ministerial Meeting had developed the draft NIP document in May

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

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

At the Sixth Meeting of the Conference of the Parties, a new chemical was adopted to be added to the Annex, and the amendment of the Annex came into force on November 2014. In response to this, the revision of the 2012 NIP was started with the cooperation of relevant ministries, and the revised NIP was drafted and published in June 2016 by the Inter-Ministerial Meeting for a 30-day public commenting period. After further considerations, the Plan was adopted as the revised NIP at the Inter-Ministerial meeting of 6 October 2016. This current revised NIP includes the three new chemical groups which were added at the Seventh Meeting of the Conference of the Parties.

Chapter 2 The current status of Japan

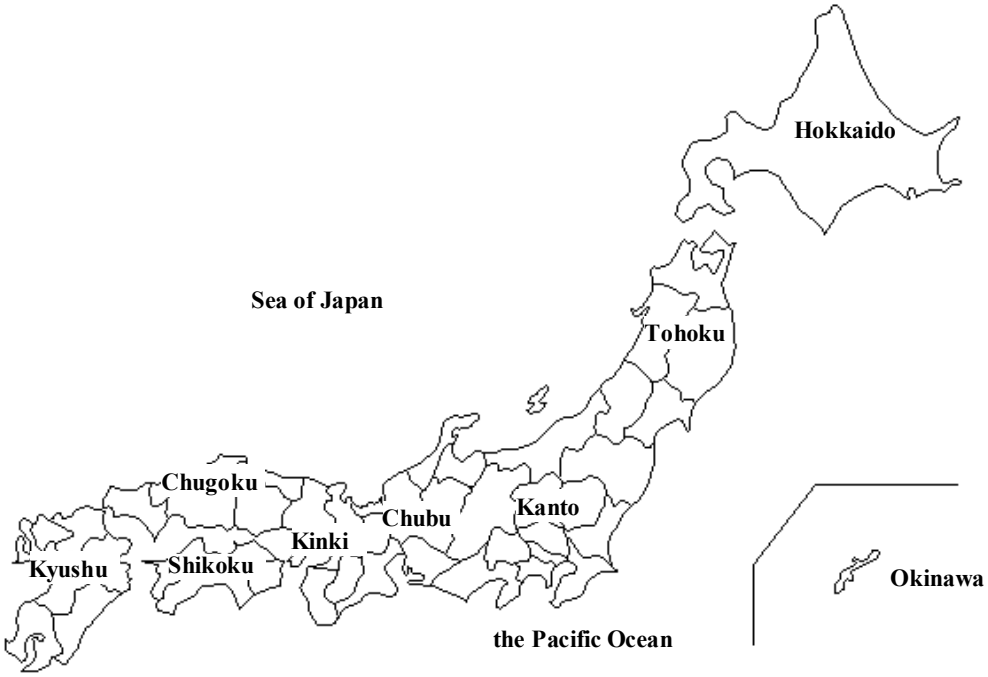
Section 1 Country profile

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 98.5% of students graduating junior high school go to high school and other institutions (as of 2015). 56.5% of students enroll in higher education institutions (universities (undergraduate course) and junior colleges), including the number of students attending preparatory schools for university (as of 2015).

(3) Population dynamics

The total population of Japan is approximately 127.11 million (as of 2015).

Table: Total population and age composition

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

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

(4) Average life expectancy

In 2014, the average life expectancy is 80.50 years for men and 86.83 years for women.

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

According to the Labour Force Survey in 2015, the population above and including

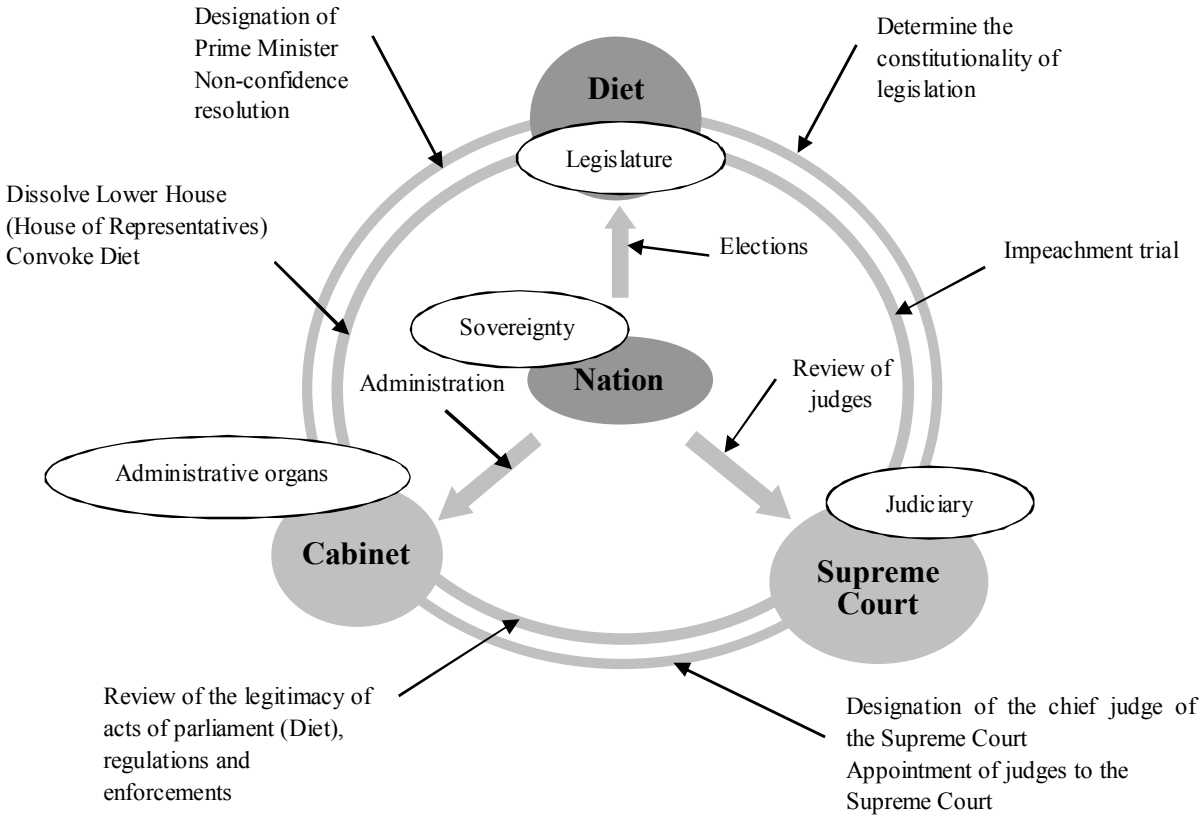
age 15 is 110.77 million. The unemployment rate is 3.4%.

2. Political structure

(1) Form of government

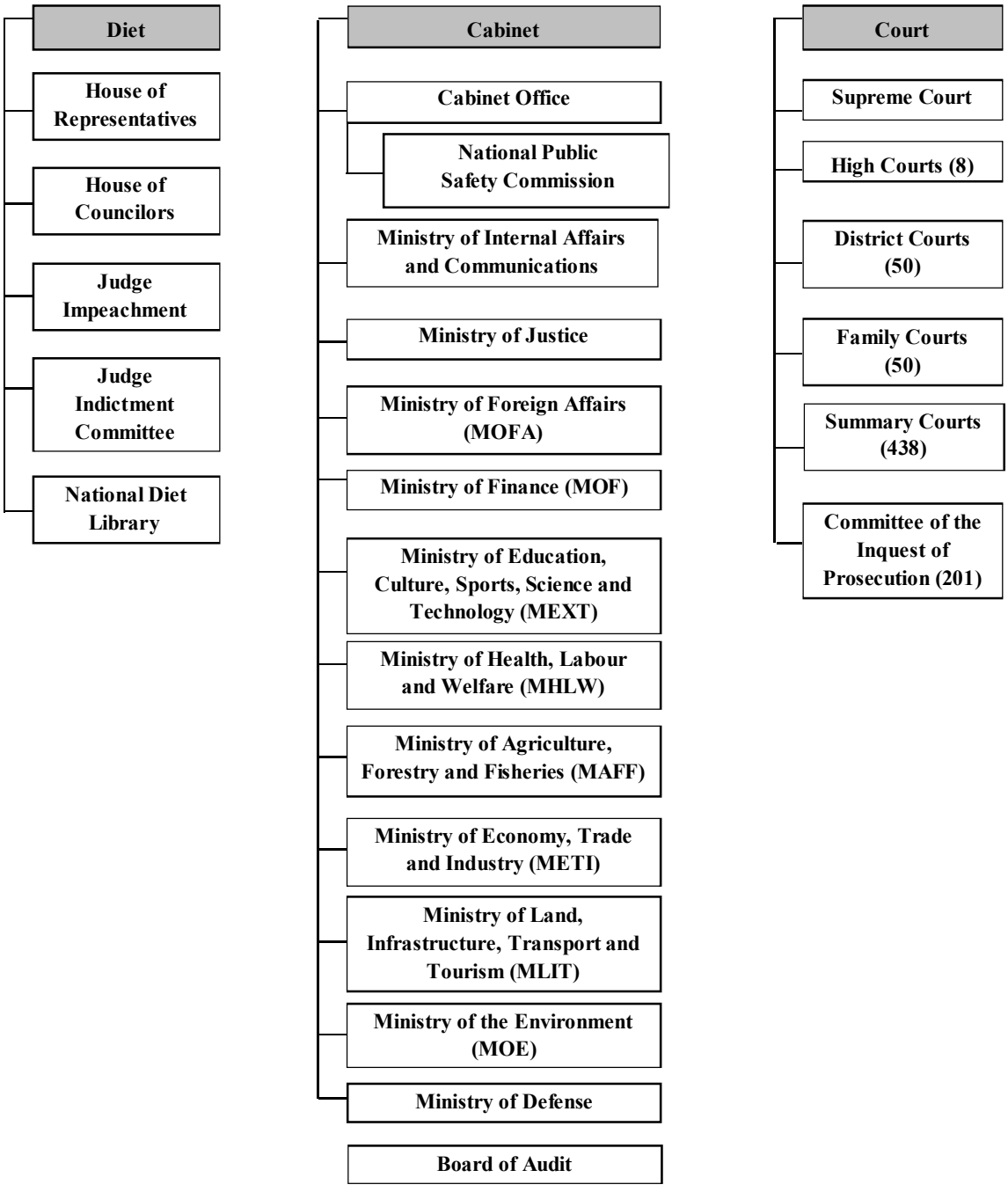
The present Constitution came into effect on 3 May 1947. The Cabinet Law came into effect at the same time, and with it the present cabinet system was established. In others words, under the sovereignty of the nation the separation of the three powers of the Executive, the Legislature and the Judiciary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

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



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

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



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

(2) The number of local public authorities

There are 47 prefectures, 790 cities, 745 towns and 183 villages in Japan (as of April

2014). 47 cities have been designated as major urban cities (as of April 2016)

Source: Homepage of the Ministry of Internal Affairs and Communications
(http://www.soumu.go.jp/gapei/gapei2.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 2014)	(2) Number of employees (thousand persons)(as of 2014)
Manufacturing	90,149 (18.5%)	9,189 (14.9%)
Mining	342 (0.1%)	20 (0.03%)
Agriculture, forestry and fisheries	5,666 (1.2%)	364 (0.6%)
Total	96,157 (14.7%)	9,573 (15.5%)

Source: (1) *Annual National Accounts,* Cabinet Office, (2) *2014 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: The definitions of manufacturing and agricultural sectors in each of the statistics vary.

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

Sector	Micro Business	Small-Scale Business	Medium-Scale Business	Large-Scale Business
Manufacturing	481,779 (86.4%)	62,112 (11.1%)	10,284 (1.8%)	3,249 (0.6%)
Agriculture, forestry and fisheries	41,107 (93.6%)	2,701 (6.1%)	112 (0.3%)	4 (0.01%)
Total of all sectors	5,743,636 (91.4%)	478,260 (7.6%)	49,949 (0.8%)	12,961 (0.2%)

Source: *2014 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications
Note: Micro businesses are defined here as holding between 1 and 19 employees, small-scale businesses between 20 and 99 employees, medium-scale businesses between 100 and 299 employees, and large-scale businesses more than 300 employees.

4. Employment in the major economic sectors

Table: Employment situation in major types of industry

Type of Industry	Number of Businesses (Establishments)	Number of Employees
Forestry	4,464	51,509
Metal mining	13	245
Coal and lignite mining	19	628
Crude petroleum and natural gas	96	3,225
Food	52,571	1,294,473
Beverages, tobacco and feed	9,006	144,520
Textile mill products	44,243	402,595
Lumber and wood products except furniture	14,600	129,956
Furniture and fixtures	23,566	156,206
Pulp, paper and paper products	11,265	218,284
Chemicals and related products	9,510	456,328
Petroleum and coal products	1,746	34,562
Plastic products	24,041	473,618
Leather tanning, leather products and fur skins	5,576	37,268
Ceramic, stone and clay products	22,881	299,516
Iron and steel	8,879	255,662
Non-ferrous metals and products	5,821	152,087
Fabricated metal products	62,656	740,055
General purpose machinery	17,753	384,544
Production machinery	41,383	641,275
Business oriented machinery	9,979	265,869
Electrical machinery, equipment and supplies	18,228	554,846
Transportation equipment	20,275	1,071,964
Electricity	2,160	140,538
Gas	573	34,769
Heat supply	199	1,961
Water	5,710	101,947
Waste treatment services	23,039	325,151

Source: *2014 Economic Census for Business Frame*, Statistics Bureau, Ministry of Internal Affairs and Communications

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 Act on Securing Quality, Efficacy and Safety of Pharmaceuticals, Medical Devices, Regenerative and Cellular Therapy Products, Gene Therapy Products, and Cosmetics (Act No. 145 of 1960, hereafter referred to as the Pharmaceuticals and Medical Devices Act), the Export Trade Control Order (Cabinet Order No. 378 of 1949) and the Import Trade Control Order (Cabinet Order No. 414 of 1949) based on the Foreign Exchange and Foreign Trade Act (Act 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 PCBs, hexachlorobenzene (HCB) and polychlorinated naphthalenes (PCNs) are considered to be similar to those of dioxins. Therefore, it is assumed that the release of PCBs, HCB and PCNs have 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 PRTR Law) dioxins and PCBs are subject to the requirements of the PRTR (Pollutants Release and Transfer Register) system.

3. Measures regarding stockpiles and wastes

(1) Collection and detoxification of POPs agricultural chemicals

Under the Agricultural Chemicals Regulation Law, the distribution or use of agricultural chemicals containing 15 chemicals listed under the Stockholm Convention or pentachlorophenol (PCP) as the active ingredient is prohibited. Additionally, manufacturers and

the like have collected these agricultural chemicals and have either stored them safely or detoxified them.

In Japan, organochlorine agricultural chemicals including certain POPs (aldrin, dieldrin, endrin, DDTs and BHC, hereafter referred to as POPs agricultural chemicals) used to be stored in the ground. According to a survey done by the Ministry of Agriculture, Forestry and Fisheries, the total amount of stored POPs agricultural chemicals and the number of the stored places identified were 4,400 tons and 168 places, respectively. Approximately 4,100 tons of these POPs agricultural chemicals were already excavated and handled properly by February 2016.

(2) Consideration on proper disposal of POPs wastes

Stored POPs agricultural chemicals mentioned above and ashes from incineration plants 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 PCBs are disposed of under the PCB Special Measures Law. To promote safe and definite detoxification, collection and transport of waste electrical machinery contaminated by small amount of PCBs, the following guidelines have been issued: "Guideline for treatment of low level PCB contaminated wastes – incineration (Revised February 2013)," "Guideline for treatment of electronical waste contaminated by small amount of PCBs – cleansing (Issued December 2013)" and "Guideline for collecting and transporting low level PCB contaminated wastes (Issued June 2013)."

To understand the actual wastes emissions and establish their disposal standards for other POPs wastes, "Technical Documents on Treatment of Agricultural Chemicals containing POPs (Revised August 2009)" and "Technical Documents on Treatment of Wastes containing PFOS (Revised March 2011)" were prepared based on the outcomes of the above mentioned development of detoxification methods for POPs agricultural chemicals and wastes containing perfluorooctane sulfonic acid (PFOS) or its salts. Other necessary measures are also considered to promote appropriate treatment of these wastes.

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 to understand and monitor long term trends of persistence of chemical substances in the environment. The measurement has been conducted, in principle, using the same sampling and analytical methods

with occasional minor adjustments as necessary. Monitoring of POPs was added in 2002 to the Environmental Survey and Monitoring of Chemicals as a new monitoring survey. This survey aims to monitor the quantity of POPs in Japan and verify the effectiveness of the measures for eliminating and reducing their emission.

The nationwide monitoring of dioxins started in 1985 with respect to bottom sediment, rivers, lakes, sea waters and aquatic organisms 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 program as the continuous monitoring program under the Dioxins Law.

The local public authorities monitor PCBs in the rivers, lakes, reservoirs and sea waters as part of the continuous monitoring program for 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 23 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 FY2014. The section also briefly addresses the monitoring results of POPs chemicals which were adopted to be listed in the Annexes of the Stockholm Convention at the Seventh Meeting of the Conference of the Parties (Polychlorinated naphtalenes, Hexachlorobutadiene, Pentachlorophenol and its salts and esters). Inter-annual trends are based on the results of surveys conducted after the introduction of a new high-sensitive analytical methods in FY2002 which significantly improved the detection limit.(See Table 1 to 3 of the Appendix for the past activities in environmental monitoring and current analytical methods used.)

(1) Dioxins

(i) Air

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

Regarding FY2014 surveys;

- A total of 2,073 specimens from 709 sites across the country were surveyed. In the 645 sites which satisfy the evaluation criteria of the environmental quality standard (0.6 pg-TEQ/m^3, measurement conducted more than twice throughout the year), the annual average of dioxins concentration was 0.021 pg-TEQ/m^3, in the range of 0.0036 to 0.42 pg-TEQ/m^3 (See Table 4 of the Appendix). Of these sites, no site exceeded the environmental quality standard for ambient air (excess rate of 0.0 %).
- Surveys for the PCDDs/PCDFs concentration had been continued at 28 sites. The average concentration of PCDDs/PCDFs at these sites was substantially declining to 0.022 pg-TEQ/m^3, compared with 0.61 pg-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 FY2014 surveys;

- A total of 1,480 sites across the country showed average dioxins concentration of 0.18 pg-TEQ/L in the range from 0.012 to 2.1 pg-TEQ/L (See Table 4 of the Appendix). Of these sites, 21 sites (20 sites in rivers and one site in a lake) exceeded the environmental quality standard for water of annual average of 1 pg-TEQ/L or less (excess rate of 1.4%).
- Surveys were continued at 665 sites. The average concentration of dioxins at these sites had been declining to 0.20 pg-TEQ/L, compared with 0.47 pg-TEQ/L in FY2000.

(iii) Bottom sediment in public waters

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

Regarding FY2014 surveys;

- A total of 1,197 sites across the country showed average dioxins concentration of 6.4 pg-TEQ/g-dry in the range of 0.068 to 660 pg-TEQ/g-dry (See Table 4 of the Appendix). Of these sites, two sites (both in rivers) exceeded the environmental quality standard for bottom sediment of 150 pg-TEQ/g or less (excess rate of 0.2%).
- Surveys were continued at 409 sites. The average concentration of dioxins at these sites had been declining to 9.4 pg-TEQ/g-dry, compared with 17 pg-TEQ/g-dry in FY2000.

(iv) Groundwater

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

Regarding FY2014 surveys;

- A total of 530 sites across the country showed average dioxins concentration of 0.050 pg-TEQ/L in the range of 0.012 to 1.0 pg-TEQ/L (See Table 4 of the Appendix). 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 FY2014 surveys;

- A total of 872 sites across the country showed average dioxins concentration of 2.3 pg-TEQ/g-dry in the range of ND (Not Detected, i.e. less than the detectable limit) to 100 pg-TEQ/g-dry (See Table 4 of the Appendix). Of these sites, no site exceeded the environmental quality standard for soil of 1,000 pg-TEQ/g-dry or less (excess rate of 0.0%).
- An average dioxins concentration at 603 sites, targeted in a general environmental survey, was 1.6 pg-TEQ/g-dry in the range of ND to 57 pg-TEQ/g-dry. An average dioxins concentration at 269 sites, targeted in a survey on areas surrounding sources was 4.0 pg-TEQ/g-dry in the range of ND to 100 pg-TEQ/g-dry.

(vi) Aquatic organisms

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

Regarding FY1999 surveys;

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

(vii) Wild mammals/birds

The government implemented surveys on wildlife from FY1997 to FY2007. (In

FY2007, study was carried out on the following four species: the great cormorant, the finless porpoise, the large Japanese field mouse and the raccoon dog, totaling 41 specmimens.)

- Accumulated concentrations remained at the same level compared with the past surveys. (see Figure 1of the Appendix)
- The surveys insisted that although the amount of environmentally released dioxins had decreased by the measures taken at the emission source, its effect is limited or will take time for the accumulated concentration in wildlife.

(viii) Human

The government started surveys on human in FY2002. Since FY2011, a more efficient monitoring study has been conducted concerning the chemicals in the human body. To determine the bioaccumulation in human bodies and the exposure concentrations, measurements of concentrations in blood and diet have been carried out in three different areas.

Regarding FY2014 surveys;

- The average dioxins concentration in blood for 81 people was 9.8 pg-TEQ/g-fat, and the concentrations were in the range of 1.1 to 34 pg-TEQ/g-fat. This level is comparable with the results in FY2012 and FY2013, and lower than the surveys before that.

(2) Polychlorinated biphenyls (PCBs)

The government continuously monitored PCBs in wildlife from FY1978 to FY2001. As for air, water and sediments, a highly sensitive analytical method has been used since FY2000, and a descriptive analysis had been done for congeners and coplanar PCBs. Using this method, the government has been monitoring the concentration levels in wildlife, air, water and sediments annually with its monitoring survey since FY2002.

(i) Wildlife

- Especially in Tokyo Bay, Osaka Bay and Offshore of Himeji, which are semi-closed water areas and located close to densely populated districts, the PCB concentration in sea bass is relatively high, compared with specimens in other areas. The figure seems to be fluctuating in these three water areas between tens and hundreds of ng/g-wet. Thus it is difficult to identify a clear trend. The PCB concentration in dace in Lake Biwa has remained stable at tens of ng/g-wet (See Figure 2 of the Appendix).
- For bivalves, the PCB concentrations in blue mussel and purplish bifurcate mussel in Dokai Bay has been decreasing. The concentrations in hard-shelled mussel in Naruto and blue mussel in Yamada Bay and coast of Noto Peninsula have stayed stable below

10 ng/g-wet. (See Figure 3 of the Appendix).

- No significant trend was observed through FY2002 to FY2014 for bivalves and fish. Regarding the FY2014 survey, PCBs were detected in all three sites for bivalves, 19 sites for fish and two sites for birds. The range of total concentration was 0.6 to 15 ng/g-wet, 0.94 to 230 ng/g-wet, 15 to 140 ng/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- Statistically significant decrease of PCB concentration for warm season was observed through FY2002 to FY2014.
- Regarding the FY2014 surveys, PCBs were detected in all 36 sites within the total concentration range of 28 to 1,300 pg/m^3.

(iii) Water

- Statistically significant decrease of PCB concentrations in rivers, lakes and estuaries were observed through FY2002 to FY2014. Reduction tendency in specimens from overall areas was also identified as statistically significant.
- Regarding FY2014 surveys, PCBs were detected in all 48 sites, and the total concentration in water varied from 16 to 4,800 pg/L. The PCB concentration exceeded 1,000 pg/L in several ports and estuaries near large cities, such as Tokyo Bay and Osaka Bay (See Table 5 of the Appendix). As for the composition of congeners and coplanar PCBs, the major congeners were PCBs with three or four chlorines (See Figure 4 of the Appendix).

(iv) Sediment

- Statistically significant decrease was observed through FY2002 to FY2014 for rivers and sea area. Reduction tendency in specimens from the overall areas was also identified as statistically significant.
- Regarding FY2014 surveys, PCBs were detected in all 63 sites and the total concentration in bottom sediment varied from 35 to 440,000 pg/g-dry. The PCB level was especially high in Osaka Port. In Keihin Canal (Port of Kawasaki), mouth of River Sumida, Kobe Bay, Dokai Bay and Naha Port, PCBs were detected over one hundred thousand pg/g-dry (See Table 6 of the Appendix).

The environmental quality standard for water and soil requires that PCBs should not be detected by the gas chromatography method at the quantification limit of 0.0005 mg/L. The

FY2014 survey on public waters and groundwater ascertained that all measuring sites meet the standard (See Table 7 of the Appendix).

(3) Hexachlorobenzene (HCB)

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

(i) Wildlife

- No significant trend was observed through FY2002 to FY2014 for the bivalves and fish surveys.
- HCB has been detected in nearly all sites since FY2002. Regarding FY2014 surveys, HCB concentration ranged from 15 to 100 pg/g-wet, 37 to 1,900 pg/g-wet and 32 to 5,600 pg/g-wet for bivalves, fish and birds, respectively. HCB was detected in all three sites for bivalves, 19 sites for fish and two sites for birds.

(ii) Air

- No significant trend was observed through FY2002 to FY2014.
- Regarding FY2014 surveys, HCB was detected in all 36 sites and concentration in air ranged from 84 to 240 pg/m^3 (warm season).

(iii) Water

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend in estuaries and in sea area, results obtained during the last four years of the study were considered lower than the ones obtained during the first four years of the study. Reduction tendency in specimens from overall areas was also identified as statistically significant. Regarding FY2014 surveys, HCB was detected in all 48 sites, and concentration in water ranged from 2.7 to 200 pg/L.

(iv) Sediments

- No significant trend was observed through FY2002 to FY2014.
- Regarding FY2014 surveys, HCB was detected in all 63 sites with a concentration

range of 4 to 5,600 pg/g-dry.

(4) Aldrin, dieldrin and endrin

The government had monitored aldrin and endrin in biological specimens annually from FY1978 to FY1989, and then on FY1991 and FY1993. The monitoring of dieldrin in wildlife was conducted annually from FY1978 to FY2001 (except in FY1997 and FY1999). Annual surveys using a high sensitive method were conducted from FY2002 to FY2009 on wildlife, air, water and sediment.

Although drins were once used within the country, the environmental concentrations stayed constant over the years. Thus, with the addition of chemicals to the Stockholm Convention, the frequencies of governmental surveys were reviewed and drins were decided to be monitored less frequently after FY2009.

Since no survey was conducted after FY2012 for dieldrin and endrin in bottom sediment, only the results obtained before the FY2011 surveys are summarized below. On the other hand, no survey was conducted after FY2010 for aldrin in water and bottom sediment, therefore only the results obtained before FY2009 are presented below.

(i) Wildlife

- No significant trend was observed through FY2002 to FY2014 for aldrin, dieldrin and endrin.
- Dieldrin has been detected in all sites since FY2002. Regarding FY2014 survey, dieldrin was detected in all three sites for bivalves, 19 sites for fish and two sites for birds, concentration ranging from 41 to 490 pg/g-wet, 27 to 1,000 pg/g-wet, and 190 to 530 pg/g-wet for bivalves, fish and birds, respectively.
- Regarding the FY2014 survey, endrin was detected with concentration ranges from 8 to 84 pg/g-wet, ND to 140 pg/g-wet, and 4 to 5 pg/g-wet in all three sites for bivalves, in 18 out of 19 sites for fish and in all two sites for birds, respectively (detection limit: 1 pg/g-wet).
- Aldrin was detected only from fish at concentration ranges of ND to 2.4 pg/g-wet, detection limit being of 0.7 pg/g-wet. Aldrin was not detected from bivalves and birds.

(ii) Air

- No significant trend was observed through FY2002 to FY2014 for aldrin, dieldrin or endrin.
- Regarding FY2014 survey, dieldrin was detected in all 36 sites and endrin detected in 32 out of 36 sites.

- The concentration of dieldrin ranged from 0.89 to 160 pg/m^3 (for warm season). On the other hand, the concentration of endrin ranged from ND to 2.9 pg/m^3 (for warm season) (detection limit for endrin: 0.07 pg/m^3).
- Regarding FY2014 survey, aldrin was detected; concentration ranging from ND to 17 pg/m^3 (for warm season), in six out of 34 sites (detection limit: 4 pg/m^3).

(iii) Water

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend in concentration of endrin in lakes and sea areas. No significant trend was observed through FY2002 to FY2014 for endrin and dieldrin in overall areas. As for aldrin, no significant trend was observed through FY2002 to FY2009 surveys.
- Regarding FY2014 survey, dieldrin and endrin were detected in all 48 sites; concentration levels were in the range from 2.7 to 200 pg/L and 0.4 to 25 pg/L, respectively.
- Regarding FY2009 survey, aldrin was detected in 32 out of 49 sites with concentrations ranging from ND to 22 pg/L (detection limit: 0.3 pg/L).

(iv) Sediment

- Statistical analysis from FY2002 to FY2011 indicated a decreasing trend in concentration of endrin in lakes. No significant trend was observed through for aldrin, endrin and dieldrin in overall areas.
- Regarding FY2011 survey, dieldrin was detected in all 64 sites at concentration levels of 2 to 2,200 pg/g-dry. Endrin was detected in 59 out of 64 sites at concentrations levels of ND to 1,100 pg/g-dry (detection limit: 0.4 pg/g-dry).
- Regarding FY2009 survey, aldrin was detected in all 64 sites (from 180 out of 192 samples) at concentrations levels of ND to 540 pg/g-dry (detection limit: 0.2 pg/g-dry).

(5) DDTs

The government started the measurement of DDTs (p,p'-DDT, o,p'-DDT, p,p'-DDE, o,p'-DDE, p,p'-DDD and o,p'-DDD) on biological specimens in 1978. Water and bottom sediment specimens were monitored for p,p'-DDT, p,p'-DDE and p,p'-DDD from 1986 to 1998 and from 1986 to 2001, respectively. In 2002, a high-sensitivity analytical method was adopted and monitoring has continued for six DDTs in all specimens. As no survey was conducted in FY2014 for wildlife and air, only results of surveys conducted before FY2013 are presented below.

(i) Wildlife

- Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in concentrations of o,p'-DDE in bivalves. The decrease in concentration of o,p '-DDT and o,p'-DDE in fish were also identified as statistically significant.
- Regarding FY2013 surveys, all of the six DDTs were detected in all five sites for bivalves, 19 sites for fish and two sites for birds. The total concentration was within the range of 290 to 6,200 pg/g-wet, 730 to 22,000 pg/g-wet and 170,000 pg/g-wet for bivalves, fish and birds, respectively.
- Of the six DDTs, the metabolite p,p'-DDE tends to dominate in wildlife specimens (See Figure 5 of the Appendix). As for fish, higher p,p'-DDE concentration was observed in sea bass from Tokyo Bay (See Figure 6 of the Appendix).

(ii) Air

- Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in concentrations of five DDTs (excluding p,p'-DDD) in warm season. As for cold season, the decrease in concentration of five DDTs (excluding p,p'-DDE) were also identified as statistically significant.
- Regarding FY2013 surveys, all six DDTs were detected in all 36 sites in both warm and cold seasons, with total concentration ranges of 0.68 to 62 pg/m^3 and 1.2 to 16 pg/m^3 respectively.

(iii) Water

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend in the concentrations of p,p'-DDT in lakes, o,p'-DDT in rivers, lakes, estuaries and seawater, p,p'-DDT and o,p'-DDT in overall areas. For o,p'-DDE, results obtained during the last four years of the study were considered lower than the ones obtained during the first four years of the study in sea and overall areas. No significant trends were observed for p,p'-DDE, p,p'-DDD and o,p'-DDD.
- Regarding FY2014 surveys, all of the six DDTs were detected in all 48 sites. The total concentration was in the range of 5.0 to 1,300 pg/L.

(iv) Sediment

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend in the concentrations of o,p'-DDT in estuaries. No significant trend was observed through FY2002 to FY2014 for any of the remaining five DDTs.

- Regarding FY2014 surveys, all six DDTs were detected in all 63 sites with the concentration range varied from 26 to 110,000 pg/g-dry.

(6) Chlordanes

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

Besides, between FY2002 and FY2013, the government conducted annual monitoring surveys for wildlife, air, water and sediment.

(i) Wildlife

- For bivalves and fish, no significant trend was observed through FY2002 to FY2013 for all five isomers of chlordanes.
- Regarding FY2013 survey, all five chlordane isomers have been detected in all five sites for bivalves, 19 sites for fish and two sites for birds. The total concentrations ranged from 280 to 6,800 pg/g-wet, 350 to 20,000 pg/g-wet (See Table 8 of the Appendix) and 2,000 to 4,800 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- Since FY2002, chlordanes are detected in all sites. Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in concentrations of all five chlordanes in warm season. Concerning the cold season, the surveys indicated a decreasing trend in concentrations of cis-chlordane Regarding FY2013 surveys, chlordanes were detected in all 36 sites, and total concentration ranged from 5.0 to 1,800 pg/m^3 and 1.7 to 280 pg/m^3 for warm and cold season, respectively.

(iii) Water

- Since FY2002, chlordanes are detected in almost all sites. Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in concentrations of cis-chlordane in overall areas. For oxychlordane, results obtained during the last four years of the study were considered lower than the ones obtained during the first four years of the study in overall areas. No significant trends were identified for trans-chlordane, cis-nonachlor and trans-nanochlor.
- Regarding FY2013 surveys, chlordanes were detected in all 48 sites within the total concentration range of 9 to 720 pg/L.

(iv) Sediment

- The chlordane concentration in bottom sediment tends to be relatively high near large cities. Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in the concentrations of cis-chlordane, trans-chlordane, cis-nonachlor and trans-nonachlor in overall areas (See Figure 7 of the Appendix). For oxychlordane, results obtained during the last four years of the study were considered lower than the ones obtained during the first four years of the study in overall areas.
- Regarding FY2013 surveys, chlordanes were detected in all 63 sites within the total concentration range from 7.2 to 19,000 pg/g-dry (See Table 9 of the Appendix).

(7) Heptachlors

The government started the measurement of heptachlor for water, bottom sediment and wildlife in 1982. It started the measurement of air in 1986. The heptachlor epoxide concentration was measured in 1982 and 1996 in water, bottom sediment and wildlife, and in 1986 in air. Annual and continual monitoring surveys using high-sensitivity analytical method have started from FY2002 for heptachlor and FY2003 for cis-heptachlor epoxide and trans-heptachlor epoxide. As no survey was conducted for wildlife and air in FY2014, only the results obtained until the FY2013 surveys are presented below.

(i) Wildlife

- No significant trend was observed through FY2002 to FY2013.
- Regarding FY2013 surveys, cis-heptachlor epoxide was detected in all five sites for bivalves, 19 sites for fish and two sites for birds. Heptachlor was detected in four out of five sites for bivalves and from nine out of 19 sites for fish, but was not detected in birds (detection limit: 1 pg/g-wet). Trans-heptachlor epoxide was only detected in birds (detection limit: 3pg/g-wet). The total concentration was within the range of ND to 120 pg/g-wet, 8.0 to 200 pg/g-wet and 160 to 570 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- Statistical analysis from FY2002 to FY2013 indicated a decreasing trend in the concentrations of heptachlor for both warm and cold seasons. It also indicated a decreasing trend in the concentrations of cis-heptachlor epoxide for cold season. No significant trend was observed for trans-heptachlor epoxide.
- Regarding FY2013 surveys, heptachlor and cis-heptachlor epoxide were detected in all

36 sites in both warm and cold season. Trans-heptachlor epoxide was only detected during the warm season (detection limit 0.05 pg/m^3). Heptachlors were detected with total concentration ranging from 0.9 to 47 pg/m^3 and from 0.43 to 23 pg/m^3 for warm and cold season, respectively.

(iii) Water

- No significant trend was observed through the surveys from FY2003 to FY2014 indicated a decreasing trend in the concentrations of cis-heptachlor epoxide in estuaries and sea areas.
- Regarding FY2014 surveys, heptachlors were detected in all 48 sites and the total concentration was in the range of 0.7 to 58 pg/L.

(iv) Sediment

- Statistical analysis from FY2003 to FY2014 indicated a decreasing trend in the concentrations of cis-heptachlor epoxide in estuaries. For heptachlor in estuaries and cis-heptachlor epoxide in overall areas, results obtained during the last four years of the studies were considered lower than the ones obtained during the first four years.
- Regarding FY2014 surveys, cis-heptachlor epoxide was detected in 59 out of 63 sites, while heptachlor was detected in 38 sites, and trans-heptachlor epoxide from only one site. The total concentration of chlordanes was within the range of ND to 350 pg/g-dry (detection limit: 1.0 pg/g-dry).

(8) Toxaphenes

The government started the monitoring of toxaphene in water and bottom sediment in 1983. No toxaphene 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. A high-sensitive analytical method was introduced in FY2003, and Parlar-26, Parlar-50, and Parlar-62 were monitored annually as toxaphenes. With the addition of chemicals to the Stockholm Convention, the frequency of surveys was reviewed, and toxaphenes were decided to be monitored less frequently from FY2010 since toxaphenes were never used domestically.

Since no survey was conducted between FY2010 and FY2014, the results up to FY2009 are summarized below.

(i) Wildlife

- Statistical analysis from FY2003 to FY2009 indicated a decreasing trend of all three toxaphenes in black-tailed gulls.

- Regarding FY2009 surveys, Parlar-50 had the highest concentration in the range of ND to 31 pg/g-wet, ND to 910pg/g-wet and ND to 620pg/g-wet for bivalves, fish and birds, respectively (detection limit: 3 pg/g-wet. Parlar-50 was detected in 27 out of 31 sites for bivalves, 85 out of 90 sites for fish and 5 out of 10 sites for birds). Parlar-26 was detected in the concentration range of ND to 23 pg/g-wet, ND to 690 pg/g-wet and ND to 500 pg/g-wet for bivalves, fish and birds (detection limit: 3 pg/g-wet. Parlar-26 was detected in 27 out of 31 sites for bivalves, 82 out of 90 sites for fish and 6 out of 10 sites for birds). Parlar-62 was only detected in fish and birds, and their concentrations were ND to 660 pg/g-wet and ND to 210 pg/g-wet, respectively (detection limit: 20 pg/g-wet. Parlar-62 was detected in 24 out of 90 sites for fish and 5 out of 10 sites for birds).

(ii) Air

- Regarding FY2009 surveys, Parlar-26 was detected in all 37 sites in warm season and from 33 out of 37 sites in cold season with the concentration range of 0.11 to 0.26 pg/m^3 and ND to 0.27 pg/m^3, respectively (detection limit: 0.09 pg/m^3). Parlar-50 was detected at concentration range of ND to 0.1 pg/m^3 for both warm and cold seasons, and only from a single site out of 37 sites in the cold season (detection limit: 0.1 pg/m^3). Parlar-62 was not detected in all 37 sites in both warm and cold seasons (detection limit: 0.6 pg/m^3).

(iii) Water

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

(iv) Sediment

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

(9) Mirex

The government surveyed the concentration of mirex in water and bottom sediment in 1983, and no mirex was detected above the minimum detectable level 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 FY2003 and annual monitoring was conducted on wildlife, air, water and

sediment. With the addition of chemicals to the Stockholm Convention, the frequency of surveys was reviewed, and mirex was decided to be monitored less frequently from FY2010, since mirex was never used domestically.

Since no survey was conducted after FY2012, the results up to FY2011 are summarized below.

(i) Wildlife

- No significant trend was observed through the surveys from FY2003 to FY2011 for bivalves and fish.
- Regarding FY2011 surveys, mirex was detected in all four sites for bivalves, 18 sites for fish and one site for birds; concentration ranging from 5.2 to 44 pg/g-wet, 1.3 to 41 pg/g-wet and 58 pg/g-wet for bivalves, fish and birds, respectively.

(ii) Air

- No significant trend was observed through FY2003 to FY2011.
- Regarding FY2011 surveys, mirex was detected in all 35 sites in warm season and all 37 sites in cold season at concentration range of 0.08 to 0.25 pg/m^3 and 0.03 to 0.11 pg/m^3 for warm and cold seasons, respectively.

(iii) Water

- No significant trend was observed through the surveys from FY2003 and FY2011.
- Regarding FY2011 surveys, mirex was detected in three out of 49 sites at concentration range of ND to 0.8 pg/L with a detection limit of 0.2 pg/L.

(iv) Sediment

- Statistical analysis from FY2003 to FY2011 indicated a decreasing trend in lakes, however, no significant trend was observed for overall sediment.
- Regarding FY2011 survey, mirex was detected in 42 out of 64 sites at concentration ranging from ND to 1,900 pg/g-dry at detection limit of 0.4 pg/g-dry.

(10) HCHs

Monitoring of HCHs was conducted for wildlife from FY1978 to FY2001 (excluding FY1997 and FY1998) with the main focus on α- and β-HCH. Water and sediment specimens were also monitored from FY1986 to FY1998 and from FY1986 to FY2001, respectively. Annual surveys in water, sediment and wildlife have been conducted on α- and β-HCH from FY2002, and γ- and δ-HCH from FY2003. Air specimens have also been monitored for all four

isomers from FY2009.

(i) Wildlife

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend of γ-HCH in bivalves and fish and a decreasing trend for α-HCH in bivalves. No significant trend was observed for β-HCH. As for δ-HCH, results obtained in the second half of the studies were lower than the ones in the first half period.
- Regarding FY2014 surveys, all HCH isomers were detected in almost all three sites for bivalves, 19 sites for fish and two sites for birds. The concentration of α-, β-, γ- and δ-HCH in bivalves were 7 to 39 pg/g-wet, 28 to 64 pg/g-wet, 4.6 to 18 pg/g-wet and ND to 3 pg/g-wet, respectively. The concentration of α-, β-, γ- and δ-HCH in fish were ND to 210 pg/g-wet, 4.4 to 460 pg/g-wet, ND to 45 pg/g-wet and ND to 23 pg/g-wet, respectively. The concentration of α-, β-, γ- and δ-HCH in birds were 17 to 220 pg/g-wet, 24 to 3,600 pg/g-wet, 4.4 to 24 pg/g-wet and 1 to 3 pg/g-wet, respectively (detection limit of α-HCH 1 pg/g-wet, γ-HCH 0.8 pg/g-wet and δ-HCH 1 pg/g-wet).

(ii) Air

- Regarding FY2014 surveys, all four isomers were detected in all 36 sites. The concentrations of α-, β-, γ- and δ-HCH in warm season were 14 to 650 pg/m^3, 0.57 to 74 pg/m^3, 1.7 to 100 pg/m^3 and 0.07 to 50 pg/m^3, respectively.

(iii) Water

- Statistical analysis from FY2002 to FY2014 indicated a decreasing trend of α-HCH in estuaries and overall areas, β-HCH in lakes, sea area and overall areas and γ-HCH in rivers, lakes, sea areas and overall areas. No significant trend was observed for δ-HCH.
- Regarding FY2014 surveys, all four isomers were detected in all 48 sites. The concentrations of α-, β-, γ- and δ-HCH were 7.3 to 700 pg/L, 11 to 1,100 pg/L, 3.5 to 350 pg/L and 0.7 to 590 pg/L, respectively.

(iv) Sediment

- No significant trend was observed through the studies from FY2002 to FY2014 for all four isomers.
- Regarding FY2014 surveys, all four isomers were detected in all 63 sites. The concentrations of α-, β-, γ- and δ-HCH were ranged from ND to 4,300 pg/g-dry, 2.9 to 7,200 pg/g-dry, ND to 2,600 pg/g-dry and 0.4 to 3,900 pg/g-dry, respectively

(detection limits for α-HCH and γ-HCH are 0.8 pg/g-dry and 0.9 pg/g-dry, respectively).

(11) Hexabromobiphenyls

The government conducted a wildlife monitoring of hexabromobiphenyls in FY1989, monitoring on water and sediment in FY1989 and FY2003, as well as an air monitoring in FY1989 and FY2004. Hexabromobiphenyls have been continually monitored since FY2009. Since no survey was carried out during FY2012 to FY2014, only the results obtained for the FY2011 survey are summarized below. Regarding FY2011 surveys, hexabromobiphenyls were detected in five out of 18 sites for fish, at a concentration range of ND to 3 pg/g-wet, and in the one site for birds with a concentration of 3 pg/g-wet. Hexachlorobiphenyls were not detected in all four sites for bivalves (detection limit: 1 pg/g-wet). Hexachlorobiphenyls were detected in eight out of 64 sites in sediment specimens, concentration ranging from ND to 6.3 pg/g-dry with a detection limit of 1.4 pg/g-dry. They were not detected in air or water with detection limits of 0.1 pg/gm^3 and 0.9 pg/L, respectively.

(12) Polybromodiphenyl ethers

The government has been monitoring polybromodiphenyl ethers (limited to congeners with four to ten bromines) in wildlife since FY2008 and in air, water and sediment since FY2009 (except in FY2013). Regarding FY2014 surveys, polybromodiphenyl ethers were detected in all three sites for bivalves, 19 sites for fish and two sites for birds, and the total concentration ranged from 210 to 830 pg/g-wet, 130 to 3,900 pg/g-wet and 200 to 1,900 pg/g-wet for bivalves, fish and birds, respectively. Polybromodiphenyl ethers were detected in 22 out of 36 sites for air, 47 out of 48 sites for water and 61 out of 63 sites for sediment. The total concentration ranged from ND to 71pg/m^3, ND to 6,200 pg/L, ND to 10,000,000 pg/g-dry for air (warm season), water and sediment, respectively. The detection limits were 5 pg/m^3, 210 pg/L and 120 pg/g-dry for air, water and sediment, respectively.

(13) PFOS

The government conducted monitoring surveys on wildlife and sediment in FY2003 and FY2005, a water monitoring in FY2002 and FY2005 and an air monitoring in FY2004. PFOS has been continually monitored since FY2009. Regarding FY2014 surveys, n-perfluorooctane sulfonic acids with linear octyl were analyzed and detected in wildlife, air, water and sediments from the majority of the sites. PFOS were detected at concentration range of ND to 93 pg/g-wet (bivalves in 2 out of 3 sites), ND to 4,600 pg/g-wet (fish in 18 out of 19 sites), 190 to 110,000 pg/g-wet (birds in all two sites) for wildlife (detection limit: 2 pg/g-wet).

PFOS was detected in all 36 sites for air, 47 out of 48 sites for water and 62 out of 63 sites for sediment. The concentrations ranged from 0.52 to 8.6 pg/m^3, ND to 7,500 pg/L and ND to 980 pg/g-dry for air, water and sediment, respectively (detection limits for water and sediment are 20pg/L and 2pg/g-dry, respectively).

(14) Pentachlorobenzene

The government conducted surveys for wildlife from FY1979 to FY1985, every other year from FY1986 to FY1996, in FY1999, in FY2007 and from FY2010 to FY2014. Pentachlorobenzene was monitored in water and sediment in FY1979, in FY2007 and from FY2010 to FY2014. Air monitoring was conducted in FY1994, in FY1999 and from FY2010 to FY2014. Regarding FY2014 surveys, pentachlorobenzene was detected in almost all sites for wildlife, air, water, and sediment. Pentachlorobenzene was detected in all three sites in bivalves, in 18 out of 19 sites in fish and in all two sites in birds. The concentration detected in wildlife ranged from 10 to 23 pg/g-wet, ND to 280 pg/g-wet and 5.6 to 560 pg/g-wet for bivalves, fish and birds, respectively. Pentachlorobenzene was detected in all 36 sites in air, 48 sites in water and 63 sites in sediment. The concentration ranged from 39 to 210 pg/m^3, 2.8 to 180 pg/L and 1.2 to 3,600 pg/g-dry for air, water and sediment, respectively.

(15) Chlordecone

The government conducted surveys for air in FY2003, and for wildlife, water and sediment in FY2008. In FY2010 and FY2011, the surveys for wildlife, air, water and sediment was conducted. Regarding FY2011 surveys, chlordecone was not detected in all four sites for bivalves, 18 sites for fish, one site for birds and 37 sites in air (detection limit: wildlife 0.2 pg/g-wet, air 0.02 pg/m^3). Chlordecone was detected in 15 out of 49 sites for water and nine out of 64 sites for sediment. The concentration in water and sediment ranged from ND to 0.7 pg/L and ND to 1.5 pg/g-dry, respectively (detection limit: water 0.05 pg/L, sediment 0.20 pg/g-dry).

(16) Technical endosulfans and its related isomers

Isomers of endosulfans (α-endosulfan and β-endosulfan) were monitored in wildlife, air, water and sediment in FY2011 and FY2012. Monitoring surveys were also conducted in FY2014 for wildlife and air.

Regarding the FY2014 surveys, endosulfans were detected in one out of three sites for bivalves and three out of 19 sites for fish; concentration ranging from ND to 160pg/g-wet and ND to 30pg/g-wet, respectively. They were not detected in birds (two sites; detection limit: 30 pg/g-wet). Endosulfans were detected in air at all 36 sites with a concentration range of 2.6 to 95 pg/m^3.

Regarding the FY2012 surveys, endosulfans were detected in two out of 48 sites in water and 12 out of 63 sites in sediment, with concentration ranging from ND to 32 pg/L and ND to 690 pg/g-dry, respectively (detection limit for water: 19 pg/L and for sediment: 10 pg/g-dry).

(17) 1,2,5,6,9,10-Hexabromocyclododecane (HBCD)

Hexabromocyclododecane was monitored in wildlife, water and sediment in FY2011, and were also monitored in wildlife, air and sediment in FY2012. Monitoring surveys were also conducted in FY2014 for wildlife, air and water.

Regarding the FY2014 surveys, hexabromocyclododecane was detected in all three sites in bivalves, 16 out of 19 sites for fish and all two sites in birds, at concentration ranges of 240 to 460 pg/g-wet, ND to 18,000 pg/g-wet, and 140 to 1,900 pg/g-wet, respectively (detection limit: 50 pg/g-wet). HBCD were detected in air from four out of 36 sites and in water from one out of 48 sites, with a concentration range of ND to 4.4 pg/m^3 and ND to 1.9 pg/L, respectively (detection limit for air: 2 pg/$m^3$and for water: 1.5 pg/L).

Regarding the FY2012 surveys, HBCD were detected in seven out of 63 sites in sediment, at a concentration range of ND to 75,000 pg/g-dry (detection limit: 350 pg/g-dry).

(18) Polychlorinated naphtalenes

Polychlorinated naphtalenes were monitored in wildlife from FY1978 to FY1985, every other year from FY1987 to FY1993, and from FY2002 to FY2008. Monitoring surveys were also conducted for water and sediment in FY2001 and FY2008, for diet in FY2002 and for air in FY1998, FY2002, FY2008 and FY2014. Regarding the FY2008 surveys, polychlorinated naphtalenes were detected in almost all site (all seven sites for bivalves, all 17 sites for fish and one out of two sites for birds), concentration ranging from 0.011 to 1.3 ng/g-wet, ND to 2.2ng/g-wet, and ND to 0.022 ng/g-wet for bivalves, fish and birds, respectively (detection limit: 0.010 ng/g-wet). Polychlorinated naphtalenes were detected in water from nine out of 48 sites and in sediment from 58 out of 63 sites, with a concentration range of ND to 0.18 ng/L and ND to 28 ng/g-dry, respectively (detection limit for water: 0.030 ng/L and for sediment: 0.030 ng/g-dry). Regarding the FY2014 surveys, polychlorinated naphtalenes were detected in all 36 sites, with concentration ranging from 5.4 to 1,600 pg/m^3.

(19) Hexachlorobutadiene

Hexachlorobutadiene was monitored in wildlife, water and sediment in FY2007 and FY2013. Regarding the FY2013 surveys, hexachlorobutadiene was detected in one out of five sites for bivalves, four out of 19 sites for fish, at concentration ranges of ND to 7.1 pg/g-wet and

ND to 59 pg/g-wet, respectively. It was not detected in birds at two sites. Detection limit for wildlife is 3.7 pg/g-wet. Haxachlorobutadiene was also detected in water from one out of 48 sites and in sediment from 20 out of 63 sites, with a concentration range of ND to 43 pg/L and ND to 1,600 pg/g-dry, respectively (detection limit for water: 37 pg/L and for sediment: 3.8 pg/g-dry).

(20) Pentachlorophenol and its salts and esters

Pentachlorophenol was monitored in water and sediment in FY1974 and FY1996, and a monitoring was also conducted in FY2005 for water. Regarding the FY2005 surveys, pentachlorophenol was not detected at all nine sites in water (detection limit: 0.11 pg/L). Regarding the FY1996 surveys, pentachlorophenol was detected in sediment at two out of 11 sites with a concentration range of ND to 14 ng/g-dry (detection limit: 10 ng/g-dry).

(21) Summary

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

(i) Among chemicals subject to environmental quality standards, these standards were met for dioxins and PCBs at most and all sites surveyed, respectively.

(ii) With regard to chemicals other than dioxins that have been continuously monitored using a high-sensitive analytical method since FY2002, the average concentration or the detection rate have remained almost constant. Nonetheless, these indicators have been decreasing for most POPs during the last 30 years.

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

(iv) For wildlife specimens, high concentrations of POPs such as PCBs and DDTs were observed in fish caught from coastal areas with densely populated 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 (the third Reduction Plan), which was established in August 2012 under the Dioxins Law, set a target of reducing emission rates up to 176 g-TEQ/year. Dioxins emissions in 2014 totaled 121 to 123 g-TEQ/year, which achieved the reduction target. This is tantamount to an approximately 98.5% reduction from the 1997 level, the first year of enforcement of the law. The status of environmental pollution has greatly improved due to the significant reduction of dioxins emissions. In recent years, achievement rates stood at close to 100% vis-a-vis environmental standards for each survey medium. In light of these achievements, considering that the improved environment would not be exacerbated, reduction measures on releases will continue to be implemented precisely in the future.

(2) Polychlorinated biphenyl (PCB)

PCBs are designated as Class I Specified Chemical Substance under the Chemical Substances Control Law and thus their manufacture, import and use are virtually prohibited. Since 2001, efforts have been made to properly dispose of PCB wastes in accordance with the PCB Special Measures Law. As for PCB wastes, they have various properties and exist in various forms, and therefore, it is required to make continuous efforts to consider effective and appropriate disposal measures.

As for PCBs unintentionally produced, it was found in February 2012 that PCBs was included as residues in certain types of organic pigments that have a wide range of domestic uses. Therefore, to establish the economically and industrial achievable minimal level of unintentionally produced PCBs, principles governing the by-production of PCBs, its management and analysis procedures have been discussed since July 2012. In January 2016, the "Report on the industrially and economically achievable minimal levels of unintentionally produced PCBs in organic pigments" was prepared. Based on this report, information on management of chemical substances containing unintentionally produced Class I Specified Chemical Substance has just been released to the concerning organizations and operators in March 2016, and the provisions for the reduction of PCB by-production are planned.

Furthermore, as the sources and categories of emission and formation processes for PCBs unintentionally produced by other ways than for organic pigments are similar to those of dioxins, the measures currently taken for dioxins are basically expected to help reduce PCB concentrations as well.

(3) Hexachlorobenzene (HCB)

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

(4) Aldrin, dieldrin, endrin and heptachlor

The manufacture, use and other activities regarding aldrin, dieldrin, endrin and heptachlor have been regulated since the 1970s-1980s under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Decreasing trends in concentrations of aldrin, dieldrin, endrin and heptachlor in some environmental media have been observed, although they are still detected in the environment. When crops particularly prone to absorb drins are cultivated in fields where such chemicals had been used, there are cases for drins to be found exceeding the Maximum Residue Limit. Therefore, the government has promoted surveillance on soil and crops as well as a conversion of crops species, and conducted research and development for technology that enables reduction of absorption of drins and heptachlor in soil by crops.

(5) DDTs

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

(6) Chlordanes

The manufacture, use and other activities regarding chlordanes have been regulated since the 1960s-1980s under the Chemical Substances Control Law, the Agricultural Chemicals Regulation Law and other regulations. Although chlordanes are still detected in the environment, decreasing trends in concentrations in some environmental media have been observed.

(7) Toxaphene and mirex

There is no record of manufacture, import or use of toxaphene and mirex in Japan. A high-sensitivity analytical method was introduced in FY 2003. Since the 2003 survey, mirex has

been detected in almost all specimens, although at a low level. Toxaphene was not detected in water or bottom sediment. Instead, it was found in some wildlife. Toxaphene was also detected in the air at the trace concentration. These two chemicals are designated as Class I Specified Chemical Substance under the Chemical Substances Control Law, and are designated as agricultural chemicals of which the distribution and use is prohibited under the Agricultural Chemicals Regulation Law. Therefore, under these laws, necessary measures to control these chemicals have been already implemented.

(8) Lindane

HCHs were used as agricultural chemicals and also as insecticides for termite control. As their registration expired in 1971 under the Agricultural Chemicals Regulation Law, they cannot be produced and imported as agricultural chemicals anymore, but were used as insecticides for termite control and wood treatment agents. As for α-, β- and γ-HCH (alias: Lindane), they were designated as Class I Specified Chemical Substance in April 2010 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited. Also, as for lindane related to agricultural use, its use and other activities have been already regulated since the 1970s under the Agricultural Chemicals Regulation Law.

(9) Hexabromobiphenyls

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

(10) Polybrominated diphenyl ethers

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

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

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

(12) Pentachlorobenzene

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

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

(13) Chlordecone

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

(14) Endosulfan

Endosulfan is a kind of organochlorinated insecticide. Its registration expired in 2010 under the Agricultural Chemicals Regulation Law, and its distribution and use have been prohibited since April 2012 based on the same law. Also, endosulfan was designated as Class I Specified Chemical Substance in May 2014 under the Chemical Substances Control Law and their manufacture, import and use are virtually prohibited.

(15) Hexabromocyclododecane (HBCD)

Hexabromocyclododecane was used as a flame retardant. It was designated as Class I Specified Chemical Substance in May 2014 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited.

(16) Hexachlorobutadiene (HCBD)

Hexachlorobutadiene was used as a solvent. It was designated as Class I Specified Chemical Substance in April 2005 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited.

(17) Polychlorinated naphtalenes

Polychlorinated naphtalenes were used as additives in lubricants and preservatives. Polychlorinated naphtalenes containing three or more chlorine atoms were designated as Class I Specified Chemical Substance in August 1979 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited. Furthermore, polychlorinated naphtalenes with two atoms of chlorine were designated as Class I Specified Chemical Substance in April 2016.

(18) Pentachlorophenol and its salts and esters

Pentachlorophenol was used as a herbicide, disinfectant and repellent, but its registration expired in 1990 under the Agricultural Chemicals Regulation Law, and its distribution and use have been prohibited since April 2012 based on the same law. Furthermore, pentachlorophenol and its salts and esters were designated as Class I Specified Chemical Substance in April 2016 under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited.

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

Section 1 Basic concept

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

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

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

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

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

Section 2 Effective implementation of the plan

1. Framework of implementation and cooperation among actors

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

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

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

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

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

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

Efforts to ensure the implementation of the national implementation plan shall be pursued through a coherent implementation framework put in place by the central government

as well as coordination and cooperation among all the actors concerned of civil society.

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

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

2. Coordination of various national policies

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

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

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

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

1. Measures under the Chemical Substances Control Law

Under the Chemical Substances Control Law, chemical substances which possess low degradability (i.e. resistant to chemical change by way of naturally occurring chemical reactions), high bioaccumulation (likely to be accumulated in bodies of living organisms) and long-term toxicity for humans or top-level predators (in cases of continuous ingestion, likely to be harmful to the survival or growth) are designated as Class I Specified Chemical Substance and are subject to regulatory measures such as prior notification for the manufacture/import (principally prohibited), limitation and prohibition of any use other than specified uses or mandatory reporting system etc. However, even when chemicals are designated as Class I Specified Chemical Substance, they still can be used under stringent control if no alternatives exist and their uses would not threaten human health. Also, if chemicals designated as Class I Specified Chemical Substance are contained in other chemicals only in small amounts as By-Product, they are not handled as Class I Specified Chemical Substance where it is confirmed that they do not pose any threats to human health through contamination of the environment, and their content rates have been lowered to technically and economically feasible levels.

As of June 2016, among the substances considered as subject to the regulation of the Stockholm Convention by the seventh Meeting of the Conference of the Parties, 31 chemical substances including 24 groups are designated as Class I Specified Chemical Substance, except PCDDs and PCDFs, which are not manufactured intentionally.

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

Also, for chemicals designated as Class I Specified Chemical Substances such as HCBs or PCBs that are found to exist as By-Product in other chemicals in small amounts, technically and economically feasible levels were established individually, and operators are requested to achieve further reductions.

Operators 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 Minister of the Environment, who shall assess these chemical substances on the basis of the existing scientific knowledge and the data submitted by the operators.

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-level predators shall continue to be regulated under the Chemical Substances Control Law.

2. Measures under the Agricultural Chemicals Regulation Law

It is stipulated under the Agricultural Chemicals Regulation Law that the distribution of the agricultural chemicals having negative impacts on agricultural crops and living creatures, as described in item 2 to item 7 of paragraph 1 of Article 3 shall be prohibited to prevent such effects under the ministerial ordinance on the basis of the stipulation of paragraph 2 of Article 9. The agricultural chemicals of which the distribution is prohibited shall also be prohibited to use by Article 11 of the law.

It has been currently prohibited under the law to distribute or use agricultural chemicals containing 15 chemicals designated under the Stockholm Convention, including DDT, aldrin, dieldrin, endrin, chlordane, heptachlor, mirex, toxaphene, HCB, lindane, chlordecone, pentachlorobenzene, α-HCH, β-HCH, and endosulfan, as well as pentachlorophenol.

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

3. Measures under the Pharmaceuticals and Medical Devices Act

Item 3 of paragraph 2 of Article 14, item 3 of paragraph 2 of Article 23.2.5 and item 3 of paragraph 2 of Article 23.25 of the Pharmaceuticals and Medical Devices Act stipulates that pharmaceuticals, quasi-drugs, cosmetics, medical devices and products of regenerative medicine

(hereafter referred to as pharmaceuticals etc.) may be approved for marketing authorization only after evaluation of their name, ingredients, composition, structure, dosage and administration, indications and usage, performance, side-effects etc.. Currently no pharmaceuticals etc. containing the chemicals of which manufacture is prohibited under the Stockholm Convention are approved in Japan.

4. Measures under the Foreign Exchange and Foreign Trade Act

The Export Trade Control Order under the Foreign Exchange and Foreign Trade Act stipulates that POPs are subject to the requirement of export approval under Article 2 of the orderas goods listed in 2.35.3 of the schedule of the said order. 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 Order 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.

Although the import of chemicals designated under the Stockholm Convention is already regulated by domestic regualtions such as the Chemical Substances Control Law, but it is also regulated under the Import Trade Control Order based on the Foreign Exchange and Foreign Trade Act, as a complementary framework, to virtually prohibit their import.

The Export Trade Control Orderand the Import Trade Control Order stipulate that the POPs wastes shall be subject to the requirement of import or export approval. These Orders, 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. hereafter referred to as the Basel Law) 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 2014) in Japan are shown in the table below. Estimated releases in 1997 when legal regulation was introduced are also shown in the same table. In Japan, polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and coplanar PCBs are categorized as dioxins under the Dioxins Law.

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

Given this situation, as described below, measures against dioxins have mainly focused upon controlling releases from waste incinerators etc. Releases (estimate) in 2014 were 121-123 g-TEQ per annum, which represents a decline of approximately 98.5% from the level of releases in 1997 (7,680-8,135 g-TEQ per annum). Subsequently, environmental status has greatly improved, and as explained in Section 3, 1. (1), the proportion that has achieved the environmental standard stands at close to 100 percent. Under these circumstances, release reduction measures will be implemented appropriately so that the current environmental status will not be exacerbated.

Inventory of dioxins emission amount (Summary)

Source categories	Releases (g-TEQ per annum)	
	Estimated amount for 1997 (Reference year)	Estimated amount for 2014
Subject to reduction target	7,676-8,129	119
Water	13	1
1. Waste disposal category	7,205-7,658	68
Water	5	0
Municipal waste incinerators	5,000	27
Industrial waste incinerators	1,505	19
Small scale waste incinerators (Subject to laws and regulations)	-	13
Small scale waste incinerators (Not subject to laws and regulations)	700-1,153	9.2
2. Industrial category	470	51
Water	6.3	0.3
Electric furnaces for steelmaking	229	22.1
Iron and steel industry sintering facilities	135	10.6
Zinc recuperation (collection) facilities	47.4	2.9
Aluminum alloys production facilities	31.0	8.2
Other facilities	27.3	6.8
3. Other sources	1.2	0.2
Water	1.2	0.2
Final sewage treatment facilities	1.1	0.2
Final dumping site	0.1	0.0
Subject to reduction target	3.6-6.2	2.3-4.2
Crematoria	2.1-4.6	1.3-3.2
Cigarettes smoke	0.1-0.2	0.1
Vehicles exhaust	1.4	0.9
Total	7,680-8,135	121-123
Water	13	1

Note1: Emission amounts between 1997 and 2007 are presented using WHO-TEF(1998) as a toxicity equivalency coefficient, and emission rates between 1997 and 2013 are presented using WHO-TEF(2006) to the possible extent.

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

Note 3: The number "0" in the table is the consequence of rounding up at decimals and standardized at g-TEQ.

(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 and a plan for reducing the release of dioxins.

Environmental quality standards

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

Note:

* The standards are in 2, 3, 7, 8-TeCDD toxicity equivalent
* The standards for the ambient air and the waters (excluding bottom sediment) are on an annual average basis.

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

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

Emission standards

(Unit: ng-TEQ/Nm^3)

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

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

Effluents
Specified Facilities and Emission Standards

(Unit: pg-TEQ/L)

Type of Specified Facilities	Emission Standard
- Bleaching facilities using chlorine or chlorine compounds used for manufacturing sulfate pulps (kraft pulps) or sulfite pulps - Cleansing facilities for acetylene used for manufacturing acetylene by carbide method - Cleansing facilities for waste gas used for manufacturing potassium sulfate - Cleansing facilities for waste gas used for manufacturing alumina fiber - Waste gas cleaning facilities, among facilities to dispose of gas generated from baking furnace used for manufacturing supported catalysts (limited to the manufacture with the use of chlorine or its compounds) - Cleansing facilities for dichloroethane used for manufacturing vinyl chloride monomer - Sulfuric acid concentration facilities, cyclohexane separation facilities, and waste gas cleansing facilities used for manufacturing caprolactam (limited to using nitrosyl chloride) - 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, its reductant cleansing facilities, dioxazineviolet cleansing facilities, and hot-air drying facilities used for manufacturing dioxazineviolet - Waste gas cleansing facilities and wet dust collecting facilities among facilities disposing of exhaust fumes from 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) - Filtering facilities, refining facilities and waste gas cleansing facilities used for metal collection from supported catalysts (spent ones only) (except collection from roasting furnaces treatment with soda ash addition and extraction with alkali (limited to processes which not use roasting furnaces treatment)) - 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 - Plasma reactive facilities, waste gas cleansing facilities and wet dust collecting facilities used for freons (CFC and HCFC) destruction (limited to plasma reaction method, waste mixed burning method, in liquid combustion method and steam heating reaction method) - Facilities for disposing water discharged from facilities subject to effluent standards	10

- Terminal treatment facilities of sewerage relating to facilities mentioned above	

Note: The standard relating to water discharged from terminal waste disposal facilities is 10 pg-TEQ/L based on orders stipulating standards for maintenance 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; shall establish Plans of Measures; and, shall implement operations including the removal of soil contamination in cooperation with stakeholders at the expense of polluters etc. under the Plans of Measures.

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

The central government provides financial assistance to local public authorities to facilitate the dismantling conducted along with facilities improvement at such sites to promote the dismantling of general waste incinerators at the time of their decommission, and encourage the effective re-use of such sites.

Furthermore, in the following areas the national government shall establish the Reducing Plan in order to ensure the comprehensive and integrated implementation of various release reduction measures within the above-mentioned institutional framework of the laws and policies concerning dioxins:

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

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

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

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

(i) Compliance with emission standards etc.

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

(ii) Report dioxins releases etc. by businesses

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

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

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

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

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

(ii) Achievement of reduction targets for waste etc.

(iii) Others

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

As regards (d) above:

(i) Appropriate and smooth implementation of the Stockholm Convention

(ii) Promotion of measures for sources of dioxins

Promotion of measures against waste; promotion of measures against unregulated sources etc.; prohibition of open burning without using a proper incinerator

(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.

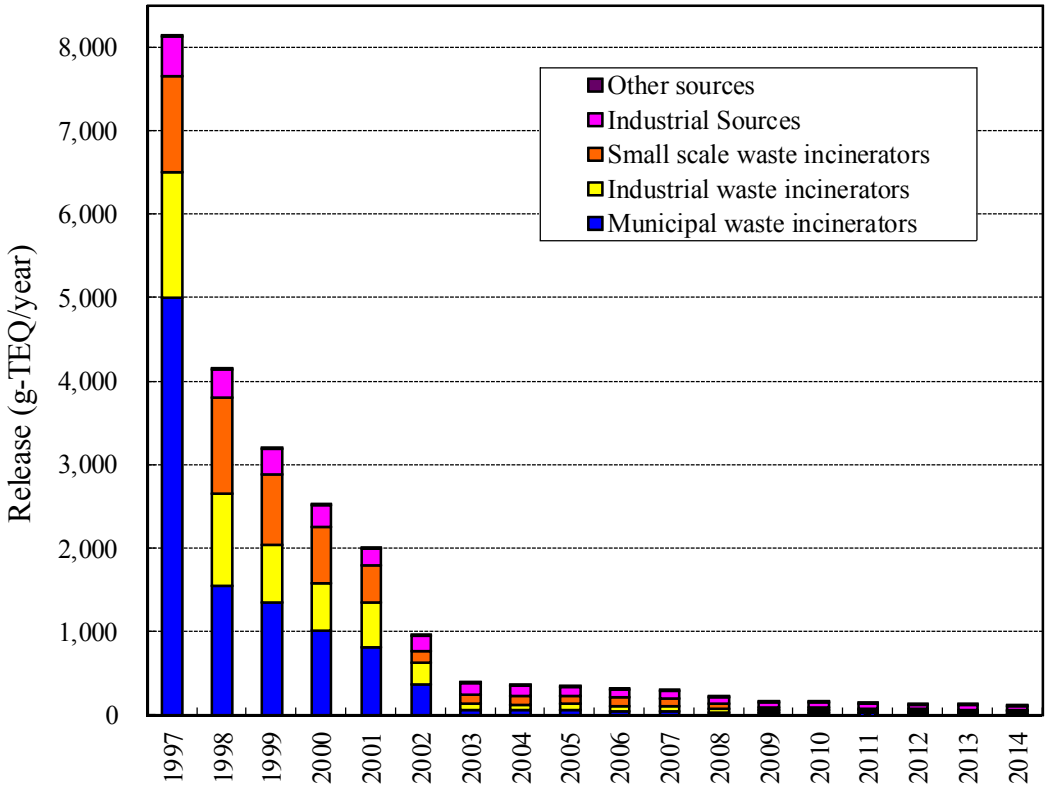
(For details refer to the annexed Reduction Plan)

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 98.5% in 2014 from the level in 1997, and this exceeds the reduction target established by the third Reduction Plan (the reduction target: 176 g-TEQ/year).

As is clear from this, Japan has continued to take measures to reduce releases of dioxins at a realistic and meaningful level as provided for in Article 5 of the Stockholm Convention.

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



(3) Strategy to promote the reduction of total releases

A) Promotion of Reduction Plan

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

B) Use of BAT and BEP

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

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

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

The measures taken and amounts of releases etc. related to each individual source

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

(a) Waste incinerators
(Measures taken)

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

(Amounts of releases etc.)

- As of the end of March 2014 there were 8,879 waste incinerators subject to the emission standard under the Dioxins Law and 2,701 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 68.2 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.3 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 2014, there were 72 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 0.09 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 2014, there were 26 specified facilities under the Dioxins Law. The amounts of releases of dioxins from sinter plants are estimated to be 10.6 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 2014, there were 754 specified facilities subject to the emission standard under the Dioxins Law and 64 specified facilities subject to the effluent standard. The amount of releases of dioxins from facilities for manufacturing aluminum base alloy are estimated to be in the order of 8.2 g-TEQ per annum, of which releases into waters are estimated to be in the order of 0.008 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 2014, there were 33 specified facilities subject to the emission standard under the Dioxins Law and 44 specified facilities subject to the effluent standard. The amounts of releases of dioxins from facilities for recovering zinc are estimated to be in the order of 2.9 g-TEQ per annum, of which amounts of releases into waters are estimated to be 0.00011 g-TEQ per annum.

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

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

(A-2) Policies on future measures

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

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

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

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

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

(a) Open burning of waste
(Measures taken)

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

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

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

(Amounts of releases etc.)

- As of the end of March 2014, there were 105 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 22.1 g-TEQ per annum.

(c) Specific chemical production processes
(Measures taken)

- Effluent from the business establishments having facilities used for the production of each of the following chemicals is subject to the effluent standard (10 pg-TEQ/L) set forth under the Dioxins Law.
    - Vinyl chloride monomer (Dichloroethane cleansing facilities)
    - Caprolactam (limited to using nitrosyl chloride)(Sulfuric acid concentration facilities, cyclohexane separation facilities, and waste gas cleansing facilities)
    - Chlorobenzene or dichlorobenzene (water washing facilities and waste gas cleansing facilities)
    - Sodium hydrogen 4-chlorophthlate (Filtering facilities, drying facilities, and waste gas cleansing facilities)
    - 2,3-dichloro-1,4-naphthoquinone (Filtering facilities and waste gas cleansing

facilities)

- Dioxazineviolet (Nitro-derivative and its reductant separation facilities, nitro-derivative and its reductant cleansing facilities, dioxazineviolet cleansing facilities, and hot-air drying facilities)
- Potassium sulfate (Waste gas cleansing facilities)
- Acetylene by carbide method (Acetylene cleansing facilities)

(Amounts of releases etc.)

- As of the end of March 2014, there were 112 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 0.125 g-TEQ per annum in 2014. Although these facilities are not subject to the emission standard, amounts of dioxins released into the air would be estimated to be 0.31 g-TEQ per annum if amounts released from these facilities were included in the calculation.

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(d) Crematoria

(Measures taken)

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

(Amounts of releases etc.)

- The amounts of releases of dioxins from crematoria are estimated to be 1.3-3.2 g-TEQ per annum.

(e) Motor vehicles

(Measures taken)

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

(Amounts of releases etc.)

- The amounts of releases of dioxins from motor vehicles are estimated to be 0.92 g-TEQ per annum.

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

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

(B-2) Policies on future measures

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

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

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

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

- A wide range of integrated environmental education/learning, designed for promoting the reduction of waste etc., including controlling waste discharges and promoting recycling, and exchanges of personnel and information between the public sector and the private sector will be promoted under the Fundamental Law for Establishing a Sound Material-Cycle Society. Infrastructure building will be promoted to enhance the supply and the diffusion of information, personnel training, and further systematization of educational programs, in order to ensure that environmental education/learning including that designed to reduce waste discharges will be promoted at schools, within the family, in workplaces, in local communities, and any other places etc. under the Law for Enhancing Motivation on Environmental Conservation and Promoting of Environmental Education (Law No. 130 of 2003).
- Systematic training shall be provided to technical experts working in official testing organizations of local public authorities etc. to help them enhance their understanding of analytical techniques and their skills for using the technologies.
- To ensure people’s better understanding and their more cooperation in addressing

issues of dioxins, the government will intensify its unified and systematic public awareness activities such as preparing an inter-ministerial pamphlet, and issuing an annual report, which will enlighten the general public on the current situation and future agendas in national efforts toward the goal of building a recycling and reuse-oriented society, with the objective of disclosing and publishing to the public, in a prompt and easily understandable manner, accurate information concerning the impacts of dioxins on human health and the environment, the results of research and development, and international trends, including relevant statistical data and their actual implications.

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

(5) Contribution to international community

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

(6) Evaluation and revision of action plan

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

(7) Schedule for implementing the action plan

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

2. Hexachlorobenzene (HCB)

(1) HCB release in Japan

Estimates on domestic HCB emissions reported at the start of estimation (in 2002), at the last modification of the National Implementation Plan (in 2009) and the current ones (as of 2014) are as follows:

Source of emission			Emission (kg/year) (Estimates)		
			2002	2009	2014
Part II Source categories			85	53	62
	Waste incinerators		44 (Water) 0.061	22	27
	Cement kilns		11	10	23
	Production of pulp		0.080 (Water) 0.080	NO	NO
	Thermal processes in the metallurgical industry		30	21	12
		Secondary copper production	NO	NO	NO
		Sinter plants in the iron and steel industry	16	14	5.0
		Secondary aluminum production	3.0	2.2	1.6
		Secondary zinc production	11	4.5	5.6
Part III Source categories			100	54	64
	Thermal processes in the metallurgical industry not mentioned in Part II		100	53	63
	Fossil fuel-fired utility and industrial boilers		0.38	0.22	0.32
	Firing installations for wood and other biomass fuels		0.034	0.21	0.21
	Specific chemical production processes		0.24	0.26	0.21
	Crematoria		0.16	0.14	0.16
	Motor vehicles		NE	0.05	0.049
	Smoldering of copper cables		0.42	0.34	0.39
Other source categories			1.9	1.0	1.2
Total			190	110	130

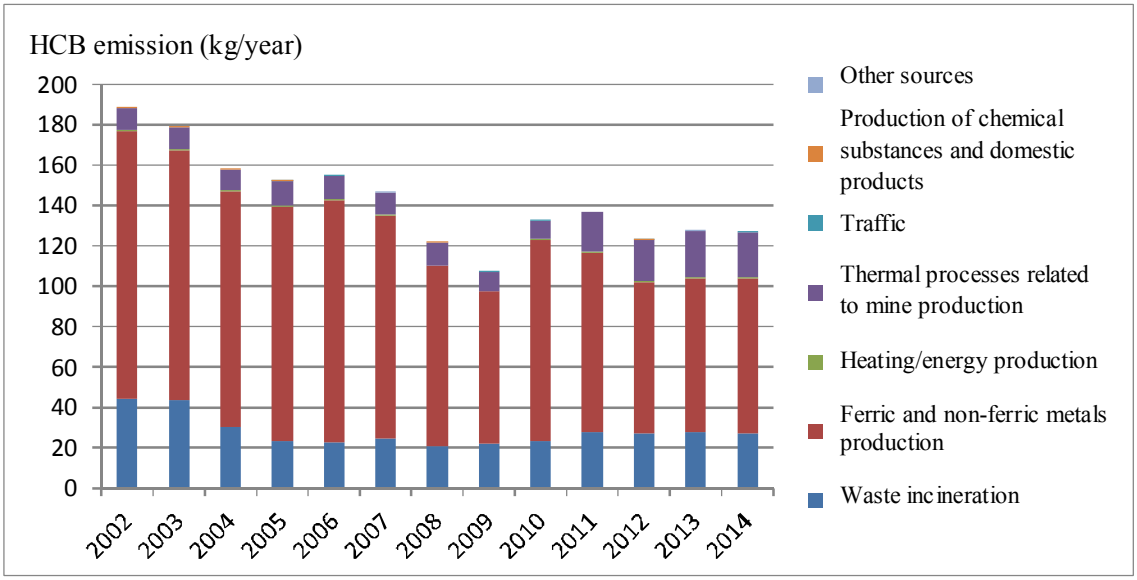
NE: Not Estimated NO: Not Occurring

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

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

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

HCB emissions variation



According to surveys conducted for domestic operating facilities, HCB produced unintentionally was generated from heat combustion processes similar to those of dioxins. HCB releases from thermal processes in the metallurgical industry, waste incinerators and cement combustion furnaces were relatively higher than other sources, with emission rates of 59%, 21% and 18%, respectively.

It was estimated that HCB emission decreased between 2002 and 2008, and after 2008, it has been stagnating. Furthermore, estimations showed a 32% emission decrease in 2014 compared to 2002.

(2) Measures to reduce HCB release

Efforts will be made to reduce HCB releases through measures stipulated in the dioxins reduction plan mentioned in Section 4.1. Particularly, some cases showed a HCB emission reduction resulting not only from improvement in exhaust gas treatment facilities, but also from improvement in operation and raw material management. As a consequence of this former experience, surveys in domestic operating facilities will continue to be conducted with a focus on HCB major sources, for example by checking HCB emission reduction effects as part of dioxins emissions reduction measures. Also, effective HCB emission reduction measures considering the BAT and BEP guidelines will be further discussed.

Moreover, as HCB release data will be maintained, efforts to promote additional measures will be made based on the survey results, such as dissemination and awareness raising through provision of useful information to operators regarding release reduction.

3. Polychlorinated biphenyls (PCB)

(1) PCB release in Japan

Estimates on domestic PCB emissions reported at the start of estimation (in 2002), at the last modification of the National Implementation Plan (in 2009) and the current ones (as of 2014), are as follows:

Source of emission	Emission (kg/year) (Estimates)		
	2002	2009	2014
Part II Source categories	450	480	550
Waste incinerators	15 (Water) 0.18	18	11
Cement kilns	350	370	480
Production of pulp	5.7 (Water) 5.7	NO	NO
Thermal processes in the metallurgical industry	82	89	63
Secondary copper production	NO	NO	NO
Sinter plants in the iron and steel industry	45	40	20
Secondary aluminum production	10	7.1	4.5
Secondary zinc production	26	41	38
Part III Source categories	100	69	83
Thermal processes in the metallurgical industry not mentioned in Part II	100	67	80
Fossil fuel-fired utility and industrial boilers	0.84	0.68	0.98
Firing installations for wood and other biomass fuels	0.28	0.22	0.23
Specific chemical production processes	0.031	0.031	0.025
Crematoria	0.44	0.40	0.45
Motor vehicles	NE	1.1	1.1
Smoldering of copper cables	0.084	0.068	0.078
Other source categories	5.1	3.3	3.3
Total	560	550	640

NE: Not Estimated NO: Not Occurring

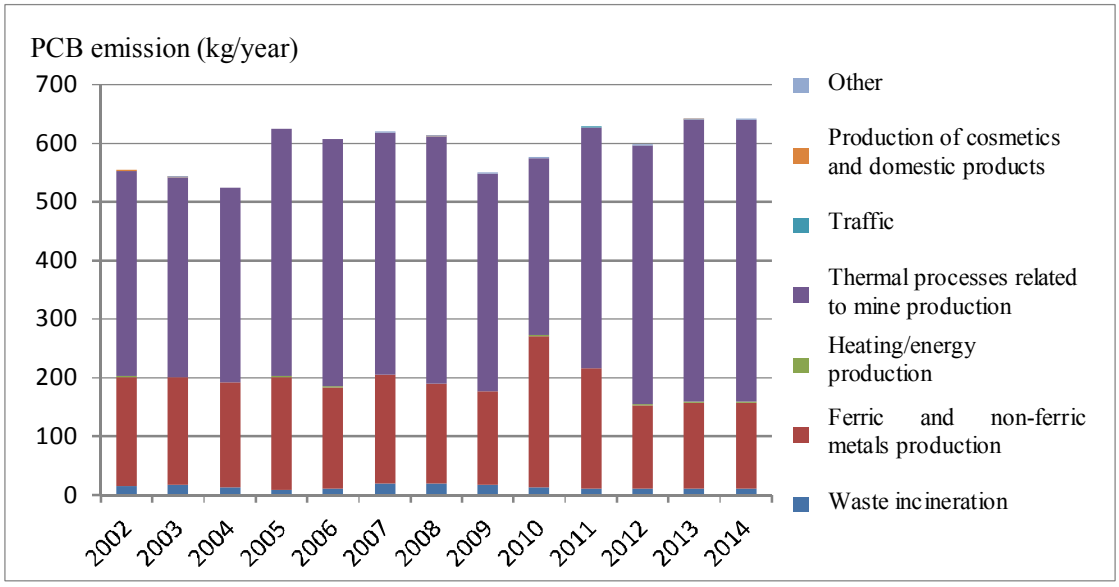
Note 1: “Water” means amount released into water as part of releases.

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

	dlPCB emission (kg/year) (Estimates)			T3CB - H7CB emission (kg/year) (Estimates)		
	2002	2009	2014	2002	2009	2014
Part II source categories	3.8	3.1	1.9	66	99	74
Part III source categories	2.2	1.7	2.0	65	36	46
Other source categories	0.16	0.12	0.11	2.8	2.2	2.0
Total	6.2	4.9	3.9	130	140	120

Note 1: The total figure is not compatible with the sum of figures in each column due to rounding.
Note 2: PCB release estimation was made using emission factors calculated based on measured data obtained from domestic sampling survey.

PCB emissions variation



According to surveys conducted for domestic operating facilities, unintentionally produced PCBs was generated from heat combustion processes similar to those of dioxins. PCB releases from thermal processes in cement combustion furnaces and metallurgical industry were relatively higher than other sources, with emission rates of 75% and 22%, respectively. Estimations showed a PCB emission decrease of 16% between 2009 and 2014, but long-term estimation between 2002 and 2014 showed a globally flat trend.

(2) Measures to reduce PCB release

As for emission reduction measures of PCBs unintentionally produced, it has been expected to date that generation/waste gas control measures similar to release reduction measures for dioxins would be effective. Since emissions from some of the source categories

reduced, measures in the dioxins reduction plan described in Section 4, 1 will continue to be applied for the reduction of PCB releases. Particularly, some cases showed a PCB emission reduction resulting not only from improvement in exhaust gas treatment facilities, but also from those in operation and raw material management. As a consequence of this former experience, surveys in domestic operating facilities will continue to be conducted with a focus on PCB major sources, for example by checking PCB emission reduction effects as part of dioxins emissions reduction measures. Also, effective PCB emission reduction measures considering the BAT and BEP guidelines will be further discussed.

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

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

4. Pentachlorobenzene (PeCB)

(1) PeCB release in Japan

Estimates on domestic PeCB emissions reported for the last modification of the National Implementation Plan (in 2009) and the current ones (as of 2014) are as follows:

Source of emission	Emission (kg/year) (Estimates) 2009	Emission (kg/year) (Estimates) 2014
Part II Source categories	150	260
Waste incinerators	82	150
Cement kilns	61	95
Production of pulp	NO	NO
Thermal processes in the metallurgical industry	7	24
Secondary copper production	NO	NO
Sinter plants in the iron and steel industry	NE	19
Secondary aluminum production	0.16	0.56
Secondary zinc production	6.8	4.9
Part III Source categories	25	51
Thermal processes in the metallurgical industry not mentioned in Part II	25	51
Fossil fuel-fired utility and industrial boilers	NE	NE
Firing installations for wood and other biomass fuels	NE	NE
Specific chemical production processes	NE	NE
Crematoria	NE	NE
Motor vehicles	NE	NE
Smoldering of copper cables	NE	NE
Other source categories	NE	NE
Total	180	320

NE: Not Estimated NO: Not Occurring

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

Note 2: PeCB emission estimation was made using emission factors calculated based on measured data obtained from domestic sampling survey. As emissions in 2009 were estimated using results from a gas exhaust facility with new equipment, the calculated values could be lower than they really are. For 2014 estimations, the number of target facilities for the sample survey was increased, and a genuine survey was conducted for cement combustion furnaces as well as for zinc secondary production. Moreover, emissions from iron and steel combustion furnaces, zinc primary/secondary refining process and wrought copper products manufacturing facilities (these are included in "Thermal processes in the metallurgical industry not mentioned in Part II" category), not subject to surveying in 2009 were also estimated. As a consequence, it can be expected that 2014 estimations are closer to real emission rates than in 2009. Also, the different estimation procedure should be taken into account when comparing the 2009 and 2014 emission values,

According to surveys conducted for domestic operating facilities, unintentionally produced PeCB was generated from heat combustion processes similar to those of dioxins. PeCB releases from waste incinerators were relatively higher than other sources, with emission rates of 46%.

(2) Measures to reduce PeCB release

As for PeCB emissions reduction measures, as it is expected that generation/waste gas control measures similar to release reduction measures for dioxins would be effective, and therefore, measures in the dioxins reduction plan described in Section 4.1 will continue to be applied for the reduction of PeCB emissions. Particularly, surveys in domestic operating facilities will continue to be conducted with a focus on PeCB major sources, for example by checking PeCB emission reduction effort as part of dioxins emissions reduction measures. Also, effective PeCB emission reduction measures considering the BAT and BEP guidelines will be further discussed.

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

5. Polychlorinated naphtalenes (PCNs)

Unintentionally produced PCNs are believed to generate mainly from heat combustion processes similar to those of dioxins. Accordingly, concerning the PCN emissions reduction measures, it is expected that generation/waste gas control measures similar to release reduction measures for dioxins would be effective, and therefore, measures in the dioxins reduction plan described in Section 4.1 will be applied.

Furthermore, a continuous survey will be conducted not only for thermal processes but for various source categories to maintain PCN emission data. Based on the survey results, efforts to promote additional measures will be made such as dissemination and awareness raising of business entities through provision of useful information to operators regarding release reduction

Section 5 Measures to eliminate polychlorinated biphenyls

1. Ban on use

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

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

On May 2, 2016, Act on the Partial Revision of the Law concerning Special Measures for Promotion of Proper Treatment of PCB Wastes (Law No. 34 of 2016) was promulgated, and business operators who hold high-concentration PCB products (products listed in paragraph 4, Article 2 of the PCB Special Measures Law. As regards PCB-containing oil, it corresponds to the oil containing more than 0.5 wt% of PCBs.) among PCB products (PCB undiluted solution, oil containing PCBs, or products which is applied, saturated, adhered or enclosed PCBs.) should dispose the products within the treatment period, which is prior to the scheduled treatment deadline (see “2. Elimination”). If the producs are electric facilities under the Electricity Utilities Industry Law, the measures will be taken as required by the Law.

2. Elimination

In Japan, approximately 59,000 tons of PCBs were produced, and 54,000 tons were used domestically. The government will promote secure and proper treatment of high-concentration PCB wastes (wastes listed in paragraph 2, Article 2 of PCB Special Measures Law. As regards PCB-containing oil, it corresponds to the oil containing more than 0.5 wt% of PCBs.) at the wide-area waste disposal facilities through the Japan Environmental Storage & Safety Corporation (JESCO), in Kitakyushu City, Toyota City (Aichi Prefecture), Tokyo, Osaka City and Muroran City (Hokkaido). The deadlines for business operators who hold PCB wastes (PCB waste holders) to commission JESCO to treat PCB wastes (scheduled treatment deadline) were established, and the preparation period for end of business was also established after the scheduled treatment deadline, as listed below, taking into account the generated amounts of high-concentration PCB wastes treatment which is not included in the

Basic Plan for Proper Treatment of Polychlorinated Biphenyl Waste (Basic Plan), developed under the PCB Special Measures Law, devices which could not be easily treated and period to prepare for the end of business. Following table is also shown in the Basic Plan.

Facilities (Place of the operation)	Type of waste	Assigned region	Wastes accepted outside assigned region	Capacity	Project period	
					Scheduled treatment deadline	Preparation period for end of business
Kitakyushu (1-chome Hibikimachi, Wakamatsu-ku, Kitakyushu City, Fukuoka)	High-voltage transformers and capacitors	A Region	Some train-mounted transformers stored in C Region, some capacitors stored in D Region	1.5 tons/day (PCB decomposition volume)	March 31, 2019	Fron April 1, 2019 to March 31, 2022
	Ballasts and contaminants	A, B, and C Regions (except for wastes assigned for Osaka and Toyota Facility)		10.4 tons/day (Ballasts and contaminants volume)	March 31, 2022	Fron April 1, 2022 to March 31, 2024
Osaka (2-chome Hokkou-Shiratsu, Konohana-ku, Osaka City, Osaka)	High-voltage transformers and capacitors	B region	Some train-mounted transformers and special capacitors stored in C Region, some special capacitors stored in E region	2.0 tons/day (PCB decomposition volume)	March 31, 2022	Fron April 1, 2022 to March 31, 2025
	Ballasts and contaminants	B Region (Only some small electrical equipment)			March 31, 2022	Fron April 1, 2022 to March 31, 2025

Toyota (3-chome Hosaya-cho, Toyota City, Aichi)	High-voltage transformers and capacitors	C Region	Some of the polypropylene capacitors stored in B Region	1.6 tons/day (PCB decomposition volume)	March 31, 2023	Fron April 1, 2023 to March 31, 2026
	Ballasts and contaminants	C Region (only some of the small electrical equipments)			March 31, 2023	Fron April 1, 2023 to March 31, 2026
Tokyo (3-chome Aomi Chisaki Koutou-ku, Tokyo)	High-voltage transformers and capacitors	D Region	Some train-mounted transformers stored in C Region, some large sized transformers stored in E Region	2.0 tons/day (PCB decomposition volume)	March 31, 2023	Fron April 1, 2023 to March 31, 2026
	Ballasts and contaminants	D Region (Only some small electrical equipment)	Powdered activated carbon waste from Kitakyushu and Osaka Facility		March 31, 2023	Fron April 1, 2023 to March 31, 2026
Hokkaido (Nakamachi, Muroran City, Hokkaido)	High-voltage transformers and capacitors	E Region		1.8 tons/day (PCB decomposition volume)	March 31, 2023	Fron April 1, 2023 to March 31, 2026
	Ballasts and contaminants	D and E regions (Except for wastes assigned for Tokyo Facility)		12.2 tons/day (Ballasts and contaminants volume)	March 31, 2024	Fron April 1, 2024 to March 31, 2026

(Note 1) Each region consist of the following prefectures

A Region: Tottori, Shimane, Okayama, Hiroshima, Yamaguchi, Tokushima, Kagawa, Ehime, Kochi, Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima and Okinawa

Prefecture

B Region: Shiga, Kyoto, Osaka, Hyogo, Nara and Wakayama Prefecture

C Region: Gifu, Shizuoka, Aichi and Mie Prefecture

D Region: Saitama, Chiba, Tokyo, and Kanagawa Prefecture

E Region: Hokkaido, Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima, Ibaraki, Tochigi, Gunma, Niigata, Toyama, Ishikawa, Fukui, Yamanashi and Nagano Prefecture

(Note 2) Scheduled treatment deadline is the deadline for PCB waste holders to commission JESCO to treat PCB wastes.

(Note 3) The preparation period for end of business is the period for JESCO to prepare for the end of business.

After the amendment of the PCB Special Measures Law, high-concentration PCB wastes holders must, in principle, treat its wastes by themselves or commission to treat the wastes within the treatment period, which is prior to the scheduled treatment deadline. To ensure the achievement of the scheduled treatment deadline, the date one year prior to each of the scheduled deadline makes it the last day of the treatment period. However, for the holders correspond to the a certain requirement, such as the commission of the treatment of the wastes by the date one year after the last day of the treatment period (hereinafter referred to as Special treatment deadline) is ensured, commission to treat the high-concentration PCB wastes should be done by the special treatment deadline, instead of the treatment period.

To treat the high-concentration PCB wastes earlier, the regulation was strengthened and improved by the provisions such as the governors may order treatment and other measures if the PCB wastes holders act against it, and the administrative subrogation may be done if the PCB wastes holders are unlikely to implement the order by the governors.

Regarding the wastes of high-concentration PCB containing high-voltage transformers and equivalent large-size electrical equipment (hereinafter referred to as large-size transformers, etc.), wastes of high-concentration PCB containing high-voltage capacitors and equivalent large-size electrical equipment (hereinafter referred to as large-size capacitors, etc.), ballasts, low-voltage transformers and low-voltage capacitors which are small in size (hereinafter referred to as small-size transformers and capacitors), and PCB contaminated wastes (only limited to wastes excluding small-size transformers and capacitors. Hereinafter referred to as other PCB contaminated wastes), the treated, stored and possessed amounts as of 31 March 2016, and the generated (the total of stored amount of high-concentration PCB wastes and possessed amount of high-concentration PCB products as of 31 March 2016) and treated amounts after the fiscal 2016 are estimated as follows, also shown in the Basic Plan.

Fiscal year	Generated amounts *1	Treated amounts *2	Stored amounts *3	Possessed amounts *3
By the end of fiscal 2015	—	Large-size transformers, etc. 13,299 units Large-size capacitors, etc. 234,421 units Ballasts 1,978,205 units Small-size transformers and capacitors 647,209 units Other PCB contaminated wastes 280 tons	Large-size transformers, etc. 3,313 units Large-size capacitors, etc. 67,378 units Ballasts 3,781,921 units Small-size transformers and capacitors 598,804 units Other PCB contaminated wastes 660 tons	Large-size transformers, etc. 337 units Large-size capacitors, etc. 12,878 units Ballasts 79,785 units Small-size transformers and capacitors 1,136 units
After fiscal 2016	Large-size transformers, etc. 3,650 units Large-size capacitors, etc. 80,256 units Ballasts 3,861,706 units Small-size transformers and capacitors 599,940 units Other PCB contaminated wastes 660 tons	Large-size transformers, etc. 3,650 units Large-size capacitors, etc. 80,256 units Ballasts 3,861,706 units Small-size transformers and capacitors 599,940 Other PCB contaminated wastes 660 tons	—	—

*1: "Generated amounts" are the amounts of high-concentration PCB wastes which are sotred and possessed as of 31 March 2016

*2: "Treated amounts" in the row "By the end of fiscal 2015" are the amounts which are treated before 31 March 2016, and the amounts in the row "After fiscal 2016" are the amounts which are expected to be treated after 1 April 2016.

*3: "Stored amounts" and "Possessed amounts" are the amounts as of 31 March 2016.

Beside the amount shown in the above table, PCB wastes are also stored, and are expected to be sequentially treated. Even though there are obligations for the PCB waste holders to notify under the PCB Special Measures Law and the Electricity Business Act, there are still unnotified PCB wastes and products present.

The wide-area waste disposal facilities by JESCO is the only high-concentration PCB

wastes treatment facilities in Japan, as a result of the efforts for past 40 years. With the survey targeting unnotified holders of high-concentration PCB wastes and products, related authorities will cooperate to commission the treatment of high-concentration PCB wastes and dispose of high-concentration PCB products within the treatment period or by the special treatment deadline.

Based on paragraph 1, Article 14 of the PCB Special Measures Law, holders who possess the low-concentration PCB wastes (PCB wastes other than the high-concentration PCB wastes) should treat them by their own or by commission the treatment to others by 31 March 2027.

A considerable number of the low-concentration PCB wastes and the low-concentration PCB products (PCB products other than the high-concentration PCB products) are considered to be present, including the products in use. As of end of March 2016, approximately 1.2 million units, 1 million units and 1,400 km of electrical equipments (other than pole transformers), pole transformers and oil-filled cables, respectively, are estimated to be present. However in many cases, analysis of PCBs is needed to confirm whether it is low-concentration PCB wastes or products. The authorities will clarify the overall picture of low-concentration PCB wastes or products, and discuss on the strategies to do so.

As regards pole transformers electric which the electric power companies store by their own, they develop the treatment facilities of their own with permission of prefectural and city governments (prefectural governments, and city governments prescribed by Cabinet Order in the provisions of paragraph 1 of Article 24.2 of the Waste Management Law; the same shall apply hereinafter), and promote the treatments. The other low-concentration PCB wastes are planned to be treated by the certified detoxifying business contractors authorized by Minister of the Environment or the special controlled industrial waste disposal business contractors permitted by prefectural and city governments. As of May 2016, 30 certified detoxifying business contractors and three special controlled industrial waste disposal business contractors are approved.

The government will continuously promote safe and efficient treatment by application of a permit system by the local governments for the special controlled industrial waste disposal business under Waste Management Law, enhancement and diversification of treatment systems, and the cost reduction of the treatment.

The processed material for the disposal of high-concentration and low-concentration PCB wastes, which meet the criteria (regarding the oil wastes, criteria is 0.5 mg PCB/kg) under the Enforcement Regulation of the PCB Special Measures Law (Ordinance No. 23 of 2001), are not PCB wastes.

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 policy for future treatment are shown as follows.

1. Stored agricultural chemicals

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

Since the Stockholm Convention was ratified in 2001, surveys were conducted to determine the management and detoxification status of these stored POPs agricultural chemicals (hereafter referred to as “stored agricultural chemicals”). The survey identified a total of approximately 4,400 tons of agricultural chemicals that had been stored underground at 168 sites nationwide. Out of the total amount, approximately 4,100 tons have been excavated and treated properly by February 2016 in accordance with the “Technical Documents on Treatment of Agricultural Chemicals containing POPs.”

As for the remaining approximately 300 tons of the stored agricultural chemicals, environmental surveys are conducted in accordance with the “Manual for the Survey, Excavation and Related Issues regarding Agricultural Chemicals Stored Underground” to prevent pollution to the surrounding environment.

Survey results on status of stored agricultural chemicals

(As of February, 2016) (In tons)

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

Miyagi	Buried	1	208.145	74.452	104.408	2.269	1.416	0.504	25.096
	Disposed	1	208.145	74.452	104.408	2.269	1.416	0.504	25.096
Akita	Buried	2	176.634	149.174					27.460
	Disposed	2	176.634	149.174					27.460
Yamagata	Buried	14	154.672	134.388	14.718	3.983	0.025	1.558	
	Disposed	14	154.672	134.388	14.718	3.983	0.025	1.558	
Fukushima	Buried	1	200.000	135.000	38.000	15.000			12.000
	Disposed	1	200.000	135.000	38.000	15.000			12.000
Ibaraki	Buried	1	65.600	55.800	7.900		1.900		
	Disposed	1	65.600	55.800	7.900		1.900		
Chiba	Buried	1	6.410	6.410					
	Disposed	1	6.410	6.410					
Kanagawa	Buried	2	73.000	30.000	17.500	11.000	13.500		1.000
	Disposed	2	73.000	30.000	17.500	11.000	13.500		1.000
Yamanashi	Buried	1	6.000						6.000
	Disposed	1	6.000						6.000
Nagano	Buried	10	376.169	1.000	0.250				374.919
	Disposed	9	367.169	1.000	0.250				365.919
Shizuoka	Buried	1	39.100	17.700	15.300	3.800			2.300
	Disposed	1	39.100	17.700	15.300	3.800			2.300
Niigata	Buried	85	492.708	364.261	86.834	5.144	1.026	0.163	35.281
	Disposed	22	327,143	222.984	73.212	1.419	0.027	0.038	29.462
Shiga	Buried	4	249.900	87.400	162.400				0.100
	Disposed	4	249.900	87.400	162.400				0.100
Wakayama	Buried	1	14.569	6.049	5.920				2.600
	Disposed	1	14.569	6.049	5.920				2.600
Tottori	Buried	19	153.414						153.414
	Disposed	1	10.665						10.665
Okayama	Buried	1	454.800	343.300	92.200				19.300
	Disposed	1	454.800	343.300	92.200				19.300
Yamaguchi	Buried	3	162.230	162.200					0.030
	Disposed	3	162.230	162.200					0.030
Ehime	Buried	1	226.271	191.998	33.569	0.242	0.250	0.212	
	Disposed	1	226.271	191.998	33.569	0.242	0.250	0.212	
Fukuoka	Buried	1	434.420						434.420
	Disposed	1	434.420						434.420
Saga	Buried	2	28.196	19.940	8.214			0.042	
	Disposed	2	28.196	19.940	8.214			0.042	
Kumamoto	Buried	2	119.900	58.949	0.604	23.766		0.065	36.516
	Disposed	2	119.900	58.949	0.604	23.766		0.065	36.516
Kagoshima	Buried	1	63.549	54.776	8.773				
	Disposed	1	63.549	54.776	8.773				
Okinawa	Buried	2	27.000	11.000	5.940	0.048		10.012	
	Disposed	2	27.000	11.000	5.940	0.048		10.012	
Total	Buried	159	4,374.007	2,202.792	912.069	68.346	18.789	39.076	1,132.936
	Disposed	77	4,056.693	2,061.515	898.447	64.621	17.790	38.951	975.368

2. Other agricultural chemicals

Under the Chemical Substances Evaluation Law, chlordanes and endosulfan were designated as Class I specified chemical substances in 1986 and 2014, respectively. Currently the production, import and use of chlordanes and endosulfan are virtually prohibited.

Regarding the disposal of obsolete chlordanes, verification tests were conducted by business entities, and they have been properly disposed of by confirmed disposal methods. The disposal is almost coming to completion.

Regarding the disposal of obsolete endosulfan, according to surveys conducted in FY 2015, approximately 6 tons (equivalent to approximately 6 tons of endosulfan) was found to be stored. Verification tests were conducted by business entities, and the obsolete endosulfan is being properly disposed of by confirmed disposal methods.

3. Dioxin-contaminated wastes

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

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

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

From April 2001, the PRTR system under the PRTR Law has started and the amount of dioxins transferred or buried have been recorded. In FY2014, 1,554 g-TEQ of dioxins were transferred or buried in wastes, such as particulates and burnt residues nationwide.

Under this law, the amount of dioxins transferred or buried is collected annually to forward the disposal of dioxin-contaminated wastes.

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

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

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

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

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

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

4. Dioxin-containing agricultural chemicals

Chloronitrophene (CNP), pentachlorophenol (PCP) and pentachloronitrophenol (PCNB) are agricultural chemicals which were registered in the past but were found to contain dioxins. Manufacturers of these agricultural chemicals are ordered to collect those stored by farmers along with those which were at the manufacture and distribution stage, and store them under stringent control.

Of the collected agricultural chemicals, pentachlorophenol (PCP) and pentachloronitrophenol (PCNB) are been detoxified by the agricultural chemical manufacturers in accordance with the "Technical Documents on Treatment of Agricultural Chemicals containing POPs."

As for chloronitrophene (CNP), the manufacturers are keeping them under stringent control in ways that would not pollute the surrounding environment. When detoxification becomes possible, they will be detoxified by the manufacturers in accordance with the "Technical Documents on Treatment of Agricultural Chemicals containing POPs" and other relevant guidelines.

5. Industrial products containing PFOS or its salts

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

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

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

According to the survey conducted in FY2011, approximately 1.5 tons (approximately 30 kg in PFOS equivalent) of PFOS or its salts in stock were identified for use in the etching agent and photosensitive film of semiconductors. By FY2015, it was reported that all of identified PFOS or its salts were disposed by business entities and no stock is remaining.

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

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

(2) Foam extinguishing agents containing PFOS or its salts

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

According to the survey conducted by the relevant ministries, in March 2016, approximately 17 tons (amount of PFOS or its salts contained) of the foam extinguishing agents containing PFOS were identified.

Although it is desirable that the foam extinguishing agents containing PFOS will be replaced with alternative products immediately, it is extremely difficult to replace them with alternatives in the short-term given the large amounts which have already been distributed nationwide. For this reason, the technical standards and labeling matters at the time of transfer

were prepared based on the Chemical Substances Control Law to enable stringent control. Also, standards based on the Fire Defense Law have been established to prevent leakage of the foam extinguishing agents containing PFOS to the exterior at the time of inspection of fire defense equipment. The relevant ministries will continue with the survey and awareness raising activities regarding stringent control.

For the disposal of foam extinguishing agents containing PFOS, the proper disposal of these wastes by relevant business entities is promoted, based on the "Technical Documents on Treatment of Wastes containing PFOS" (Issued in September 2010 and revised in March 2011).

Survey results about foam extinguishing agents containing PFOS etc.

Prefecture	Amount (In PFOS or its salts equivalent *) Unit: kg					
	Total	Fire-fighting organizations	Airport	Self-Defense Forces facilities	Petrochemical complexes etc.	Others
Hokkaido	269.808	18.966	233.806	7.245	6.283	3.491
Aomori	161.023	30.149	0	130.874	0.025	0
Iwate	9.606	3.409	0	1.833	0.050	4.364
Miyagi	266.413	41.333	69.033	35.481	3.093	117.466
Akita	69.251	32.123	0	2.671	0.025	34.457
Yamagata	39.04	29.929	0	2.837	0	6.274
Fukushima	56.122	6.323	0	2.226	0.244	47.373
Ibaraki	211.117	33.657	0	52.309	1.568	123.551
Tochigi	21.105	0.289	0	2.243	0.137	18.473
Gunma	35.736	0	0	0.620	11.207	23.916
Saitama	517.56	40.072	0	53.680	30.262	393.508
Chiba	1,402.706	801.098	0	31.793	265.136	304.715
Tokyo	3014.81	42.367	96.039	8.807	5.783	2,861.797
Kanagawa	2,017.623	779.901	0	213.868	60.638	963.254
Niigata	969.801	700.683	35.911	12.661	108.155	112.346
Toyama	104.93	29.169	0	0.157	19.025	56.604
Ishikawa	201.94	1.309	0	63.211	1.560	135.820
Fukui	3.472	3.409	0	0	0.012	0.063
Yamanashi	13.146	7.472	0	0	1.762	3.874
Nagano	151.878	57.168	0	0.079	16.087	78.531
Gifu	156.191	3.336	0	87.503	10.648	54.752
Shizuoka	130.734	28.125	0	60.750	20.069	21.759
Aichi	2,124.573	303.105	0	22.834	16.643	1,782.034
Mie	199.693	29.106	0	11.199	132.154	27.234
Shiga	58.387	1.394	0	1.955	17.841	37.238
Kyoto	227.156	0.311	0	148.580	8.025	70.265
Osaka	1,306.431	232.220	9.021	0	765.816	299.390
Hyogo	282.62	48.341	0	2.165	67.303	164.814
Nara	24.14	1.859	0	1.012	0.112	21.169
Wakayama	32.521	8.729	0	1.248	10.422	12.144
Tottori	24.548	0.942	0	23.606	0.012	0
Shimane	30.051	0	0	3.134	0.012	26.917
Okayama	123.684	28.686	0	0.131	66.529	28.367

Hiroshima	531.276	29.498	33.042	273.811	34.161	160.725
Yamaguchi	108.933	63.075	0	33.430	1.913	10.528
Tokushima	24.2	0.382	0	23.218	0.556	0
Kagawa	34.336	0	34.184	0.052	0.112	0
Ehime	196.25	2.797	32.768	0.052	49.144	111.533
Kochi	73.341	0	73.289	0.052	0.025	0
Fukuoka	470.419	6.329	137.787	52.554	37.217	236.549
Saga	39.085	33.600	0	5.385	0.062	0
Nagasaki	211.979	0	24.853	103.126	84.037	0
Kumamoto	31.426	0	15.690	6.293	0.062	9.343
Oita	121.983	4.257	31.926	0.209	82.062	3.491
Miyagi	39.345	2.093	25.032	12.220	0.037	0
Kagoshima	153.359	16.038	49.469	84.797	0	3.055
Okinawa	271.859	15.082	32.400	217.831	0	6.546
Total	16,565.880	3,518.132	934.251	1,799.741	1,936.026	8,377.730

(Note)

Fire-fighting organizations: The Fire and Disaster Management Agency conducted the survey of every fire-fighting headquarters through the prefectures. As of the end of March 2016.

Airports: The Ministry of Land, Infrastructure, Transport and Tourism conducted the survey of airports under state control in particular. As of the end of March 2016.

The Self-Defense Forces facilities: The Ministry of Defense conducted the survey of the Self-Defense Forces camps, bases etc. As of the end of March 2016.

Petrochemical complexes etc.: The Ministry of Economy, Trade and Industry conducted the survey of relevant companies through industrial groups. As of the end of March 2016.

Others: The Ministry of the Environment conducted the survey to the extent possible with the help of the Japan Fire Extinguishing Systems Manufactures Association, General Incorporated Association. As of the end of December 2014. It is difficult to identify all foam extinguishing agents containing PFOS or its salts under the control of private companies, and possibilities remain that the numbers may change, from future planned surveys.

* In cases where types of foam extinguishing agents were evident, conversion was conducted based on the concentration of PFOS or its salts contained in the foams. When types were unclear, conversion was conducted to the extent possible using the average concentration etc.

6. Brominated flame retardants of plastics

Hexabromobiphenyl (HBB), Polybromodiphenyls (POP-BDEs (tetrabromodiphenyl ethers, pentabromodiphenyl ethers, hexabromodiphenyl ethers, heptabromodiphenyl ethers)) and hexabromocyclodecane (HBCD) are brominated flame retardants. These chemicals were designated as Class I Specified Chemical Substance under the Chemical Substances Control Law, and their manufacture, import and use are virtually prohibited. (HBB and POP-BDEs were designated in 2010, and HBCD was designated in 2014.)

Regarding HBB, there are no records of production or import, and there are no stocks as of February 2016.

POP-BDEs have been used in cathode ray tube monitor casings, phenolic paper laminated sheet, etc. The currently existing main stock is cathode ray tube monitor casings. When cathode ray tube monitor casings are discarded, the majority is sent to home appliance recycling plants and is dismantled manually, crushed and recycled as recycled pellet. Japan has registered this recycling as specific exemptions to the secretariat of the Stockholm Convention.

As for waste insulation materials containing HBCD, appropriate measures to promote proper disposal are currently under consideration, foreseeing their mass disposal in the future.

7. Chlorine agents

Hexachlorobenzene (HCB) and polychlorinated naphthalenes (PCNs) with three or more chlorines were designated as Class I specified chemical substances in 1979 under the Chemical Substances Control Law. Hexachlorobutadiene (HCBD), pentachlorophenol (PCP) or its salts or esters, and PCNs with two chlorines were also designated as Class I specified chemical substances in 2016 under the same law. The status of each agent's stockpile is as below. Survey will be done to identify the details of storage and the identified waste agents will be managed or disposed properly.

Regarding HCB, there is currently no stockpile excluding those from unintentional production.

As for PCNs, PCNs containing rubber products, adhesives, insulating oil in rectifiers and waste fluid from titanyl phthalocyanine production are being properly disposed by relevant business entities by methods which have been verified through verification tests done by the business entities.

As for HCBD, waste fluids from tetrachloroethylene and trichloroethylene production are being properly disposed by relevant business entities by methods which have been verified through verification tests done by the business entities.

Regarding PCNs and PCP, the major remaining stockpile is wood treated with PCNs or PCP. The amount of PCNs or PCP remaining is being investigated and measures to promote appropriate disposal is being considered.

Section 7 Strategy for Identification of contaminated sites

1. Dioxins

(1) Anti-pollution measures for soil

Dioxins have been under regular observation by local public authorities since FY2000 in accordance with the Dioxins Law. Surveys on dioxins in soil are categorized as follows to efficiently determine the state of pollution.

(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 facilities that generate and emit dioxins to soil around these sources.

(iii) Survey on target areas

This survey is carried out to determine dioxins concentrations in soil in areas that are under threat of dioxins contamination (target areas according to the result of study on available information).

If the soil is found to exceed the survey index value of 250 pg-TEQ/g in the general environment survey, the surrounding soil is analyzed for dioxins concentration. If the site exceeds the environmental quality standard for soil of 1,000 pg-TEQ/g, further survey is performed to determine the extent and depth of the contaminated soil.

Areas with dioxins levels exceeding the environmental quality standard for soil will be designated by the local public authority as the controlled areas against soil contamination in accordance with the Dioxins Law. The local public authority will then establish Plans of Measures and implement antipollution measures based on the plan, including removal and detoxification of the soil.

By March 2015, six areas have been designated as controlled areas. Out of these areas, three areas have already been delisted, and necessary measures were implemented for the remaining three areas.

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

(2) Antipollution measures for bottom sediment

(i) Contamination survey on dioxins in bottom sediment

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

In FY1998, local public authorities such as prefectures and municipalities nationwide carried out dioxins surveys on bottom sediment in public water bodies. Regular dioxins monitoring has been conducted since FY2000.

Also after FY1999, dioxins surveys to analyze the contamination of water and bottom sediment in first-class rivers etc. have been done continuously, and "The draft manual for constant monitoring of dioxins in rivers and lakes etc." was published. This manual describes the methods for constant monitoring, for example, the selection of survey areas, sampling sites, and the observation and measurement items. In FY2002, dioxin surveys were conducted on ports and harbours being developed under government-sponsored projects, as well as on waterways to be developed and preserved. This aims to ensure safe, smooth implementation of dredging operations. In addition, a survey was carried out in Tokyo Bay on POPs, including dioxins, in marine sediment as part of a marine reclamation project.

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

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

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

(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 "Manual for measures against dioxins in bottom sediment in rivers and lakes" has been drafted in cooperation with academic experts. Based on this manual, anti-pollution measures are being implemented to address dioxins in bottom sediment in public water bodies.

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

(b) Ports and Harbours

To implement necessary measures safely and consistently against dioxins found in ports and harbours during dredging operation, the government compiled the "Technical Guidelines on Measures against Dioxins in Bottom Sediment of Ports and Harbours" in March 2003 (revised in December 2003 and April 2008) and the "Data Book on Dioxin Decomposition and Detoxification Technology for Bottom Sediment in Ports and Harbours" in March 2005 in cooperation with professional experts. These were distributed to relevant organizations.

Measures against dioxin in bottom sediment of ports and harbours are promoted on the basis of the Technical Guidelines and the Data Book.

2. Polychlorinated biphenyls (PCB)

(1) Antipollution measures for soil

PCB is designated as a specified hazardous chemical under the Soil Contamination Countermeasures Act (Act No.53 of 2002). Surveys are to be conducted, for example, when facilities that manufacture, use or dispose of PCB have closed down, and the form or nature of land changes in ways that could lead to soil contamination. If the survey results reveal that standards stipulated under the law were not met, measures would be implemented including removal of contaminated soil as necessary.

(2) Antipollution measures for bottom sediment

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

A nationwide survey was conducted in FY1972 on PCB-contaminated bottom sediment. A total of 79 water areas were found to require antipollution measures, including removal of PCBs. By November 2004, antipollution measures for PCB-contaminated bottom sediment were completed for all of the 79 areas.

3. Others

The Waste Management Law and the Dioxins Law require that burnt residues and dusts containing dioxins be buried in Landfill Site for Domestic Wastes and Industrial Wastes (Leachate-Controlled Type), while those exceeding the standard must be taken to Landfill Site for Hazardous Industrial Wastes (Isolated Type), in order to prevent environmental pollution.

In addition, sites where 2,4,5-T (a herbicide which contains dioxins as contaminants), were buried in an appropriate manner that prevents polluting, are managed properly.

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

In Japan, 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. are assessed before production or distribution. If they are inadequate as drugs etc., production or sale permission is not issued.

Under the Chemical Substances Control Law, new industrial chemical substances are prior reviewed for degradability, accumulation, long-term toxicity on humans and toxicity to plants and animals. If a chemical is found to be highly persistent, accumulative and possess long-term toxicity 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, registrations of those chemicals will be withheld. These conditions include fabrication of information in the registration form, when the chemical's value as an agricultural chemical is not accepted, and when the chemical may pose harm to human or livestock. In addition, if a registered agricultural chemical was found to cause damage under the condition met in item 2 to 7 of paragraph 1 of Article 3 (e.g. when agricultural chemicals cause soil pollution and the contaminated crops may cause harm to human or livestock), the distribution shall be prohibited on the basis of the stipulation of paragraph 2 of Article 9 to prevent adverse effects on human health and environment. Moreover, the use of such agricultural chemicals can also be prohibited following Article 11. At

present, it is prohibited to distribute or use agricultural chemicals containing 27 chemicals as active ingredients, including the 15 chemicals designated under the Stockholm Convention and pentachlorophenol.

As for pharmaceuticals etc., item 3 of paragraph 2 of Article 14, item 3 of paragraph 2 of Article 23.2.5, and item 3 of paragraph 2 of Article 23.25 of the Pharmaceuticals and Medical Devices Law (including cases where it shall read and apply pursuant to the provisions of the Article 83) stipulates that pharmaceuticals etc. may be approved for marketing only after evaluation of their name, ingredients, composition, structure, dosage and administration, indications and usage, performance, side-effects etc,. based on the toxicity, absorption and metabolism of new substances. If they are inadequate for drugs etc., production or sale permission is not issued.

Thus, in Japan, the above laws are applied to chemicals that have similar properties to those of POPs.

Section 9 Measures for monitoring POPs in the environment

(1) Summary of activities for environmental monitoring of POPs

The Ministry of the Environment established an expert group to discuss measures to be taken for environmental monitoring of chemicals designated under the Stockholm Convention. The group deliberated on how to determine the state of environmental contamination and how to evaluate the effects of measures currently being taken. The monitoring policy and monitoring method for POPs was developed utilizing high-resolution gas chromatography/high-resolution mass spectrometry. The monitoring policy and the monitoring method will be revised as necessary and the government will continue to carry out nationwide surveys on water, bottom sediment, air and wildlife for 21 groups of POPs and newly designated POPs, excluding dioxins.

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

As for Dioxins, local public authorities implement large-scale nationwide surveys under the Dioxins Law, which also requires regular observation, in public water, bottom sediment, ambient air and soil; this survey will continue. The government will also continue to implement surveys on human biological samples.

In addition, 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 on chemicals designated under the Stockholm Convention will be carried out as follows:

(2) 21 groups of chemicals other than dioxins and newly designated chemical substances

(i) Chemicals surveyed

- PCBs (total PCBs and total for each number of 1 to 10 chlorides)
- DDTs (o,p'-DDT, p,p'-DDT, o,p'-DDE, p,p'-DDE, o,p'-DDD and p,p'-DDD)
- Chlordanes (trans-chlordane, cis-chlordane, trans-nonachlor, cis-nonachlor and oxychlordane)
- Dieldrin, aldrin, endrin, mirex and toxaphenes
- HCB
- Heptachlors (Heptachlor, cis-heptachlor epoxide, trans-heptachlor epoxide)
- HCHs (α-HCH, β-HCH, γ-HCH, δ-HCH)
- Chlordecone
- Hexabromobiphenyls
- Polybromodiphenyl ethers (number of bromine: 4 to 10)
- PFOS or its salts, perfluorooctane sulfonyl fluoride (PFOSF)
- Pentachlorobenzene
- Endosulfan
- Hexabromocyclododecanes

(Newly designated chemicals)

- Polychlorinated Naphthalenes (total PCN and total for each number of 1 to 8 chlorides)
- Hexachlorobutadiene
- Pentachlorophenol and its salts and esters

(ii) Media and sites of survey (Results of FY2014 survey)

- Water (48 sites including major rivers, major lakes, ports and harbours.)
- Water (monitoring sites in rivers, lakes and seas under the Water Pollution Control Law)
- Bottom sediment (63 sites including major rivers, major lakes, ports and harbours.)
- Air (36 sites selected from 100-km^2 gridded area nationwide)
- Wildlife (Total of 22 sites for sea bass, greenling, rock greenling, Okinawa seabeam, dace, blue mussel, Pacific saury, chum salmon, striped mullet and Great Cormorant)

(3) Dioxins

(i) Chemicals surveyed

PCDDs, PCDFs and coplanar PCBs

(ii) Media and sites of survey (Results of FY2014 survey)

- Water (major rivers, major lakes, reservoirs, ports and harbours: 1,480 sites)
- Bottom sediment (major rivers, major lakes, reservoirs, ports and harbours: 1,197 sites)
- Air (general environment, areas surrounding sources of emission, roadsides: 645 sites)
- Soil (general environment, areas surrounding sources of emission: 872 sites)
- Groundwater (530 sites)
- Human biological samples (blood)

Section 10 International measures

1. Measures in responses to the Stockholm Convention

(1) Assistance to developing countries etc.

In many cases, developing countries do not have regulatory framework for hazardous substances, which may result 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 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, is to provide financial and technical assistance to the parties to the convention which are developing countries and countries with economies in transition. Japan has cooperated actively with these arrangements, taking into account the concerns and needs of these countries in the area of finance and technology.

(i) Technical cooperation

Japan has provided technical cooperation to developing countries in the field of environment management technology for the chemical industry, technology for the analysis and risk assessment of the environmental load of chemical substances, technology for the microanalysis of chemical substances etc. by dispatching experts to and receiving trainees from these countries. As regards the bilateral ODA projects, more than 150 trainees participated in "Training Course for Chemical Management Policy" as International Training and Dialogue since 2005, and "Chemical Management Policy: Reflecting International Discussion" as

regional training courses for Asian countries on management and reduction of chemical substances from 2011. Also, from 2011 to 2015, international training courses for capacity building in POPs management were provided in cooperation with Brazil to 10 Latin American countries, to help them achieve the targets under the Stockholm Convention. In addition, the Project of Capacity Building for Analysis and Reduction Measures of Persistent Organic Pollutants in Serbia has started from 2014. Such cooperation will be continued upon requests from developing countries.

(ii) Financial assistance

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

In the sixth replenishment of GEF (from July 2014 to June 2018), a new focal area titled "Chemicals & Waste" was established combining the previously separate focal areas of POPs and ozone-depleting substances (ODS), and included mercury and Strategic Approach to International Chemicals Management (SAICM). This allowed the government to provide finance for a more integrated management of chemicals. In the sixth replenishment of GEF, Japan has contributed 607 million dollars representing 16.39% of the Fund's total of 4.43 billion dollars on a pledging basis.

(iii) Regional arrangements

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

Results of the surveys done in eight countries in the East Asia region till FY2006 were compiled in the "Asia Pacific Monitoring Report (December 2008)" which were submitted to the Secretariat of the Stockholm Convention. In addition, the result of the surveys done in six countries in the East Asia region till FY2012 was submitted as the "Second Asia Pacific Monitoring Report (March 2015)" to the Secretariat of the Stockholm Convention.

In the future, Japan, in cooperation with neighboring areas such as East Asia, will

conduct POPs Monitoring providing technical assistance, and contribute to the evaluation of the effectiveness of the Stockholm Convention based on Article 16.

(2) Exchange of information

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

2. Coordination with other related international conventions

In addition to the Stockholm Convention, the Basel Convention 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) are also international conventions related to chemical substances management. Japan has been cooperating actively to these Conventions and recognizes that the Stockholm Convention and these Conventions in the field of trade and the environment are mutually supportive.

The Basel Convention, which aims to regulate the transboundary movement and disposal of hazardous wastes, was adopted in March 1989 and entered into force in May 1992. Japan acceded to the Convention in September 1993 and the Convention came into effect in Japan in December 1993. Paragraph 2 of Article 6 of the Stockholm Convention stipulates that the Conference of Parties to the Convention shall cooperate closely with appropriate bodies of the Basel Convention. Japan was the lead country in the update of technical guideline on the environmentally sound management of PCB wastes (adopted in the twelfth meeting of the Conference of the Parties to the Basel Convention in May 2015) which was established under the Basel Convention, as stipulated under Paragraph 1 (d) (ii) of Article 6 of the Stockholm Convention. Japan is also the lead country in the revision project to add PCN waste in the same guideline. In addition, Paragraph 1 (d) (iv) of Article 6 of the Stockholm Convention 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 also requires waste management in an environmentally sound manner. In Japan, the Basel Law and the Waste Management Law have been properly enforced to regulate the import and export of hazardous wastes. Wastes that contain POPs and are designated as specific hazardous wastes under the Basel Law are required to be properly managed from the perspective of the environment under the Basel Law. To publicize the scope of the Basel Convention and the regulations under the Basel Law to prevent

illegal export of wastes, the government, in cooperation with Customs Offices, has organized briefing meetings on the Basel Law etc. across the country. The Ministry of the Environment and the Ministry of Economy, Trade and Industry have also conducted prior consultation services on matters relating to the export and import of hazardous wastes.

The PIC Convention stipulates prior informed consent (PIC: Prior Informed Consent) procedure for certain hazardous chemical substances and pesticides in international trade. The PIC Convention was adopted at the Diplomatic Conference held in September 1998, and entered into force in February 2004. Japan lodged with the depository instrument of acceptance in June 2004 and the PIC Convention entered into force in Japan in September 2004.

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

The government will continue to actively cooperate under these Conventions related to chemical management.

Activities to enhance cooperation and coordination (synergy) among the three Conventions are occurring. For example, the Stockholm, Basel and PIC Conventions have established a joint secretariat, and the regional centers established under the Stockholm and Basel Convention are used to provide technical assistance in capacity building to enhance the ability of developing countries to implement their obligations under the three Conventions. Further cooperation and coordination among the three Conventions is expected to raise awareness of the importance of chemical substance and waste management and further promote the enhancement of the implementation of each convention. Japan will be engaged properly in international activities to strengthen synergy among the three Conventions through collaboration among the relevant ministries and agencies.

Section 11 Provision of information

1. Compilation of information

The government has taken various measures for providing information on POPs. For example, it has made efforts for raising awareness and promoting understanding of POPs issues through the provision of information on POPs such as webpage and pamphlets on POPs, as well

as on dioxins and PCB (table below).

The government will continue to actively provide information on POPs.

Pamphlets and brochures	POPs - Persistent Organic Pollutants -
	Dioxins 2012 (Japanese version)
	Dioxins 2012 (English version)
	Toward the Sound Disposal of Polychlorinated Biphenyls(PCB) Wastes Within the Designated Timeframe
Webpages	POPs ・http://www.meti.go.jp/policy/chemical_management/int/pops.html ・http://www.env.go.jp/chemi/pops/treaty.html
	Chemical Substances Control Law ・http://www.nihs.go.jp/mhlw/chemical/kashin/kashin.html ・http://www.meti.go.jp/policy/chemical_management/kasinhou/index.html ・http://www.env.go.jp/chemi/kagaku/index.html
	Measures against Dioxins (Japanese) ・http://www.env.go.jp/chemi/dioxin/index.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 to exchange opinions with NGOs etc. Furthermore, in the development and revision of the national implementation plan, the government has published the document for public comments at the drafting stage.

The government will continue to communicate with the relevant 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 and distribution of pamphlets in occasions such as the agreement to the draft Convention text at the fifth Inter-Governmental

Negotiating Committee, the adoption of the Convention at the Diplomatic Conference, Japan's accession to the Convention and the results of the meeting of the Conference of the Parties.

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

Section 12 Promotion of research and technological development

1. Overall policy

The Science and Technology Basic Plan (decided by the Government of Japan in January 2016) describing the basic policy for the promotion of science and technology for a period of 5 years from FY 2016, prescribes the "Target National Image" as "Ensure safety and security for our nation and its citizens and a high-quality, prosperous way of life" one of its targets. And to ensure a safe and secure living environment, the plan prescribes to promote development of evaluation and management technologies to protect sound water cycle, soil and ecosystem, and furthermore, utilize study results on rapid or sophisticated evaluation of chemicals as basic data for chemical safety assessment and promote them from the standpoint of international contribution.

2. Individual research and technological development

In accordance with paragraph 1 (a) to (g) of Article 11 of the Stockholm Convention, the following comprehensive research and technological development shall be promoted, regarding (1) the environmental behavior including source, monitoring, analysis 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 are not limited to Japan.

(1) Environmental behavior including source, monitoring, analysis and modeling

Multimedia models for POPs on source, monitoring, analysis and modeling relevant to environmental behaviors was developed, taking into account environmental factors distinct to Japan and Asia.

A simple and rapid method for the extraction of POPs from soil was developed and studies to ascertain physiological mechanism regarding absorption and transportation of POPs in various crop plants were conducted. A study to develop a method to predict residual concentrations in cucurbitaceous vegetable based on POPs concentrations in agricultural soil is being conducted.

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

For brominated dioxins, assessment was done on the status of emissions from sources.

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

Chemical substance specific prediction system, which estimates the chemical's degradability and accumulation, were developed by adopting evaluation methods using structure-activity relationship (SAR) based on chemical structure and empirical rules. Degradability and accumulation are items that are evaluated for POPs.

(3) Technologies for release reduction and detoxification

Basic studies were carried out including chemical degradation technologies using iron, soil decontamination technologies using complex degrading bacteria and wood based carbonization material, search of degrading bacteria, soil cleansing utilizing highly absorbent plants, and development of technologies to restrain absorption by crops through the application of absorption materials (activated carbon) to soil.

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 on reporting the implementation status of the Convention decided by the Conference of the Parties at its first meeting, and 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 response to cases such as the addition of the chemicals to the Stockholm Convention, the revision of related domestic plans and various changes in the environment and the economy.

The national implementation plan will undergo public commenting for its revision, including the outcomes of the review.

Appendix

1. Status of general environment (Tables and Figures)

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

1. Status of general environment (Tables and Figures)

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

		74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Wildlife	Dioxins												O	O	O	O	B1	B1	B1	B1	B1	B1	B1	B1	B1	O	O	O,E	O	O	O	O	O	O	O							
	PCBs					B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB	B1	B1			B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1,E		B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1					E				B2	B2	B2	B2	B2	B2	B2	B2					B2
	Endrin	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1					E				B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	Dieldrin	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1,E		B1,E		B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	DDTs	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2			B2	
	Chlordanes								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Heptachlors								B1																					B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Toxaphenes																														B2	B2	B2	B2	B2	B2	B2					
	Mirex																														B2	B2	B2	B2	B2	B2	B2		B2			
	HCHs	B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1		B1		B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2		B2	
	Hexabromobiphenyls																B1																			B2	B2	B2				
	Polybromodiphenyl ethers (Br_4–Br_{10})														B1	B1														B2	B2					B2		B2	B2	B2		B2
	Perfluorooctane sulfonic acid (PFOS)																														B2		B2				B2	B2	B2	B2		B2
	Pentachlorobenzene		B1				B1	B1	B1	B1	B1	B1	B1	B1		B1		B1		B1		B1		B1			B1								B2			B2	B2	B2	B2	B2
	Chlordecone																																		B2		B2	B2				
	Endosulfan																																					B2	B2		B2	
	1,2,5,6,9,10-Hexabromocyclododecane																																					B2	B2		B2	
Air	Dioxins													O	O	O	O	O	O	O	O	O	O	O	A	A	A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A	D,A
	PCBs																								B1		B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB																					B1				E	B1			B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin																													B2	B2	B2	B2	B2	B2	B2	B2					B2
	Endrin																													B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	Dieldrin																													B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	DDTs																													B2	B2	B2	B2	B2	B2	B2	B2	B2			B2	
	Chlordanes													B1																B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Heptachlors													B1																B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Toxaphenes																														B2	B2	B2	B2	B2	B2	B2					
	Mirex																														B2	B2	B2	B2	B2	B2	B2		B2			
	HCHs																														(B2)	(B2)	(B2)	(B2)	(B2)	(B2)	B2	B2	B2	B2		B2
	Hexabromobiphenyls																B1															B2					B2	B2				
	Polybromodiphenyl ethers (Br_4–Br_{10})																											B1				B2				B2	B2	B2	B2		B2
	Perfluorooctane sulfonic acid (PFOS)																															B2					B2	B2	B2	B2	B2	B2
	Pentachlorobenzene																					B1					B1								B2		B2	B2	B2	B2	B2	B2
	Chlordecone																														B2							B2	B2			
	Endosulfan																																						B2	B2		B2	
	1,2,5,6,9,10-Hexabromocyclododecane																																						B2	B2		B2	

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

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

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

		74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14
Water	Dioxins																									O	O	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	PCBs		W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	B1, E, W	B1,W	B2, W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W	B2,W	B2	B2	B2	B2
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2					
	Endrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	Dieldrin	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2		B2			B2
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2				B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E				B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Heptachlors									B1																				B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2		B2
	Toxaphenes										B1																				B2	B2	B2	B2	B2	B2	B2					
	Mirex										B1																				B2	B2	B2	B2	B2	B2	B2		B2			
	HCHs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1				B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2		B2
	Hexabromobiphenyls																B1														B2						B2	B2	B2				
	Polybromodiphenyl ethers (Br_4-Br_{10})				B1										B1	B1								B1						B2	B2	B2					B2	B2	B2	B2		B2
	Perfluorooctane sulfonic acid (PFOS)																													B2			B2				B2	B2	B2	B2		B2
	Pentachlorobenzene		B1				B1																												B2			B2	B2	B2	B2	B2
	Chlordecone																																			B2		B2	B2			
	Endosulfan																																						B2	B2		
	1,2,5,6,9,10-Hexabromocyclododecane																																						B2			B2
Sediment	Dioxins												O	O	O	O	B1	B1	B1	B1	B1	B1	B1	B1	B1	O	O	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	PCBs																							B1	B1			B1,E	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	HCB	B1	B1			B1								B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
	Aldrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2					
	Endrin	B1																								E				B2	B2	B2	B2	B2	B2	B2	B2		B2			
	Dieldrin	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2		B2			
	DDTs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2				B2
	Chlordanes									B1				B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1,E	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	
	Heptachlors									B1																				B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2		B2
	Toxaphenes										B1																				B2	B2	B2	B2	B2	B2	B2					
	Mirex										B1																				B2	B2	B2	B2	B2	B2	B2		B2			
	HCHs	B1												B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2		B2
	Hexabromobiphenyls																B1														B2						B2	B2	B2				
	Polybromodiphenyl ethers (Br_4-Br_{10})				B1										B1	B1								B1						B2	B2	B2					B2	B2	B2	B2		B2
	Perfluorooctane sulfonic acid (PFOS)																														B2		B2				B2	B2	B2	B2		B2
	Pentachlorobenzene		B1				B1																												B2			B2	B2	B2	B2	B2
	Chlordecone																																			B2		B2	B2			
	Endosulfan																																						B2	B2		
	1,2,5,6,9,10-Hexabromocyclododecane																																							B2			
Soil	Dioxins																									O	O	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D

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

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

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

Compound	Wildlife	Air	Water	Sediment	Soil
Dioxins [1]	-	HRGC/HRMS	GC/MS	GC/HRMS	GC/HRMS
PCBs [2]	GC/HRMS (31pg/g-wet)	GC/HRMS (1.4pg/m^3)	GC/HRMS (2.9pg/L)	GC/HRMS (21pg/g-dry)	-
HCB	GC/HRMS (3pg/g-wet)	GC/HRMS (0.5pg/m^3)	GC/HRMS (0.4pg/L)	GC/HRMS (2pg/g-dry)	-
Drins	GC/HRMS (0.7 - 1pg/g-wet)	GC/HRMS (0.07 - 4pg/m^3)	GC/HRMS (0.2pg/L)	GC/HRMS (0.4 - 2pg/g-dry)*	-
DDTs	GC/HRMS (0.7 - 1.4pg/g-wet)*	GC/HRMS (0.007 - 0.04pg/m^3)*	GC/HRMS (0.08 - 0.4pg/L)	GC/HRMS (0.2 - 1.4pg/g-dry)	-
Chlordanes	GC/HRMS (0.7 - 5.2pg/g-wet)*	GC/HRMS (0.01 - 0.3pg/m^3)*	GC/HRMS (0.3 - 1pg/L)*	GC/HRMS (0.3 - 0.8pg/g-dry)*	-
Heptachlors	GC/HRMS (0.8 - 3pg/g-wet)*	GC/HRMS (0.01 - 0.05pg/m^3)*	GC/HRMS (0.2 - 0.3pg/L)	GC/HRMS (0.2 - 0.5pg/g-dry)	-
Toxaphenes	GC/HRMS (3 - 20pg/g-wet)*	GC/HRMS (0.09 - 0.6pg/m^3)*	GC/MS-NCI (2 - 20pg/L)*	GC/MS-NCI (4 - 30pg/g-dry)*	-
Mirex	GC/HRMS (0.8pg/g-wet)*	GC/HRMS (0.001pg/m^3)*	GC/HRMS (0.2pg/L)*	GC/HRMS (0.4pg/g-dry)*	-
HCHs	GC/HRMS (0.8 - 1pg/g-wet)	GC/HRMS (0.06 - 0.08pg/m^3)	GC/HRMS (0.2 - 1.5pg/L)	GC/HRMS (0.1 - 0.9pg/g-dry)	-
Hexabromobiphenyls [2]	GC/HRMS (1pg/g-wet)*	GC/HRMS (0.1pg/m^3)*	GC/HRMS (0.9pg/L)*	GC/HRMS (1.4 pg/g-dry)*	-
Polybromodiphenyl ethers (Br_4-Br_{10})	GC/HRMS-SIM-EI (4 - 60pg/g-wet)	GC/HRMS (0.09 - 3pg/m^3)	GC/HRMS (0.6 - 9pg/L)	GC/HRMS (2 - 20pg/g-dry)	-
Perfluorooctane sulfonic acid (PFOS)	LC/MS/MS-SRM-ESI-negative (2pg/g-wet)	LC/MS/MS-SRM-ESI-negative (0.06pg/m^3)	LC/MS/MS-SRM-ESI-negative (20pg/L)	LC/MS/MS-SRM-ESI-negative (2pg/g-dry)	-
Pentachlorobenzene	GC/HRMS (3.1pg/g-wet)	GC/HRMS (0.3pg/m^3)	GC/HRMS (0.3pg/L)	GC/HRMS (0.8pg/g-dry)	-
Chlordecone	LC/MS/MS-SRM-ESI-negative (0.2pg/g-wet)	GC/HRMS (0.02pg/m^3)	LC/MS/MS-SRM-ESI-negative (0.05pg/L)	LC/MS/MS-SRM-ESI-negative (0.2pg/g-dry)	-
Endosulfans	GC/HRMS (6 - 20 pg/g-wet)	GC/HRMS (0.3 - 0.4pg/m^3)	GC/HRMS (9 - 10pg/L)*	GC/HRMS (5 pg/g-dry)*	-
1,2,5,6,9,10-Hexabromocyclododecane	LC/MS/MS-SRM-ESI-negative (10 pg/g-wet)	LC/MS/MS-SRM-ESI-negative (0.3 - 0.6pg/m^3)	LC/MS/MS-SRM-ESI-negative (200-600pg/L)	LC/MS/MS-SRM-ESI-negative (60 - 100 pg/g-dry)*	-

*: No survey in FY 2014 (analytical method and minimum detectable concentration for FY 2013 or before) -: No survey in FY 2014

1 The nationwide monitoring of dioxins was started in 1985 with respect to bottom sediment in the rivers, lakes and sea waters and aquatic organisms, 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 analytical method for PCBs, HRGC/HRMS was introduced in 2000. Moreover, the government has carried out nationwide environmental monitoring of other POPs, changing the analytical methods from GC-ECD to GC/HRMS (high-resolution) on wildlife, and from GC/MS to GC/HRMS (high-resolution) on water and bottom sediment. Besides above surveys, local governments have been monitoring PCBs in rivers, lakes, marshes and sea waters as part of the regular-observation system under the Water Pollution Control Law.

2 For PCBs and Hexabromobiphenyls, minimum detectable concentrations shown in the table are the sum of the limits for each congener.

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

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

Environmental mediums	Type of survey or site category (water groups)			FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	EQSs
Air	all sites		average	0.55	0.23	0.18	0.15	0.13	0.093	0.068	0.059	0.052	0.050	0.041	0.036	0.032	0.032	0.028	0.027	0.023	0.021	
			range	0.01 -1.4	0 -0.96	0.0065 -1.1	0.0073 -1.0	0.009 -1.7	0.0066 -0.84	0.0066 -0.72	0.0083 -0.55	0.0039 -0.61	0.0053 -0.40	0.0042 -0.58	0.0032 -0.26	0.0049 -0.37	0.0054 -0.32	0.0051 -0.45	0.0047 -0.58	0.0029 -0.20	0.0036 -0.42	
			(no. of sites)	(68)	(458)	(463)	(920)	(979)	(966)	(913)	(892)	(825)	(763)	(740)	(721)	(712)	(691)	(689)	(676)	(666)	(645)	
		in general	average	0.55	0.23	0.18	0.14	0.14	0.093	0.064	0.058	0.051	0.051	0.041	0.035	0.031	0.031	0.028	0.025	0.022	0.02	0.6
			(no. of sites)	(63)	(381)	(353)	(705)	(762)	(731)	(691)	(694)	(628)	(577)	(565)	(538)	(536)	(530)	(522)	(520)	(508)	(497)	
		vicinity of sources	average	0.58	0.2	0.18	0.15	0.13	0.092	0.078	0.063	0.055	0.05	0.04	0.041	0.035	0.036	0.032	0.03	0.027	0.022	
			(no. of sites)	(2)	(61)	(96)	(189)	(190)	(206)	(188)	(161)	(165)	(158)	(148)	(156)	(147)	(133)	(142)	(132)	(135)	(122)	
		along roads	average	0.47	0.19	0.23	0.17	0.16	0.091	0.076	0.055	0.054	0.05	0.044	0.036	0.031	0.028	0.025	0.03	0.025	0.025	
			(no. of sites)	(3)	(16)	(14)	(26)	(27)	(29)	(34)	(37)	(32)	(28)	(27)	(27)	(29)	(28)	(25)	(24)	(23)	(26)	
Public Water	water	all sites	average	-	0.50	0.24	0.31	0.25	0.24	0.24	0.22	0.21	0.21	0.21	0.20	0.19	0.19	0.19	0.20	0.19	0.18	
			range	-	0.065 -13	0.054 -14	0.012 -48	0.0028 -27	0.01 -2.7	0.02 -11	0.0069 -4.6	0.007 -5.6	0.014 -3.2	0.0097 -3.0	0.013 -3.0	0.011 -3.1	0.01 -2.1	0.012 -3.4	0.0084 -2.6	0.013 -3.2	0.012 -2.1	
			(no. of sites)	-	(204)	(568)	(2,116)	(2,213)	(2,207)	(2,126)	(2,057)	(1,912)	(1,870)	(1,818)	(1,700)	(1,617)	(1,610)	(1,594)	(1,571)	1,537	(1,480)	
		River	average	-	-	0.40	0.36	0.28	0.29	0.27	0.25	0.24	0.23	0.25	0.23	0.22	0.21	0.22	0.23	0.22	0.20	1
			(no. of sites)	-	-	(186)	(1,612)	(1,674)	(1,663)	(1,615)	(1,591)	(1,464)	(1,454)	(1,408)	(1,319)	(1,223)	(1,244)	(1,229)	(1,207)	(1,189)	(1,149)	
		Lakes and Reservoirs	average	-	-	0.25	0.22	0.21	0.18	0.2	0.17	0.18	0.18	0.16	0.16	0.17	0.21	0.18	0.18	0.19	0.20	
			(no. of sites)	-	-	(63)	(104)	(95)	(102)	(99)	(100)	(89)	(91)	(91)	(87)	(91)	(86)	(79)	(87)	(83)	(75)	
		Sea area	average	-	-	0.14	0.13	0.13	0.092	0.094	0.095	0.082	0.096	0.072	0.078	0.073	0.077	0.065	0.069	0.070	0.070	
			(no. of sites)	-	-	(319)	(400)	(444)	(442)	(412)	(366)	(359)	(325)	(319)	(294)	(296)	(287)	(286)	(277)	(265)	(256)	
	Bottom Sediment	all sites	average	-	8.3	5.4	9.6	8.5	9.8	7.4	7.5	6.4	6.7	7.4	7.1	7.1	6.9	7.0	6.8	6.7	6.4	
			range	-	0.10 -260	0.066 -230	0.0011 -1,400	0.012 -540	0.0087 -640	0.057 -420	0.05 -1300	0.045 -510	0.056 -750	0.044 -290	0.067 -540	0.059 -390	0.054 -320	0.05 -640	0.042 -700	0.056 -640	0.068 -660	
			(no. of sites)	-	(205)	(542)	(1,836)	(1,813)	(1,784)	(1,825)	(1,740)	(1,623)	(1,548)	(1,505)	(1,384)	(1,316)	(1,328)	1,320	(1,296)	(1,247)	(1,197)	
		River	average	-	-	5.0	9.2	7.3	8.5	6.3	7.1	5.6	5.8	6.6	6.4	5.9	6.3	6.3	6.0	6.1	5.7	150
			(no. of sites)	-	-	(171)	(1,367)	(1,360)	(1,338)	(1,377)	(1,336)	(1,241)	(1,191)	(1,152)	(1,060)	(1,001)	(1,011)	(1,009)	(982)	(948)	(921)	
		Lakes and Reservoirs	average	-	-	9.8	11	18	13	11	9.4	8.4	9.2	10	9.2	9.1	10	9.0	8.8	8.5	8.9	
			(no. of sites)	-	-	(52)	(102)	(85)	(86)	(89)	(90)	(79)	(84)	(82)	(79)	(84)	(75)	(68)	(76)	(73)	(64)	
		Sea area	average	-	-	4.9	11	11	14	11	9.0	9.2	9.7	10	9.4	10	10	9.5	9.5	8.6	8.7	
			(no. of sites)	-	-	(319)	(367)	(368)	(360)	(359)	(314)	(303)	(273)	(271)	(245)	(243)	(230)	(243)	(238)	(226)	(212)	
Ground Water			average	-	0.17	0.096	0.092	0.074	0.066	0.059	0.063	0.047	0.056	0.055	0.048	0.055	0.048	0.047	0.049	0.26	0.05	
			range	-	0.046 -5.5	0.062 -0.55	0.00081 -0.89	0.0002 -0.92	0.011 -2.0	0.00032 -0.67	0.0079 -3.2	0.0088 -0.72	0.013 -2.2	0.0076 -2.4	0.01 -0.38	0.011 -0.88	0.0098 -0.44	0.0084 -0.62	0.0084 -1.6	0.011 -110	0.012 -1.0	1
			(no. of sites)	-	(188)	(296)	(1,479)	(1,473)	(1,310)	(1,200)	(1,101)	(922)	(878)	(759)	(634)	(608)	(590)	(538)	(546)	(556)	(530)	
Soil	Total		average	-	6.5	-	6.9	6.2	3.8	4.4	3.1	5.9	2.6	3.1	3.1	2.5	3	3.4	2.6	3.6	2.3	
			range	-	0.0015 -61	-	0 -1,200	0 -4,600	0 -250	0 -1,400	0 -250	0 -2,800	0 -330	0 -170	0 -190	0 -85	0 -94	0 -140	0 -150	0 -230	0 -100	
			(no. of sites)	-	(286)	-	(3,031)	(3,735)	(3,300)	(3,059)	(2,618)	(1,782)	(1,505)	(1,285)	(1,073)	(976)	(998)	(969)	(917)	(921)	(872)	
		in general	average	-	-	-	4.6	3.2	3.4	2.6	2.2	2	1.9	2.7	2.8	2.1	2.1	2.0	1.6	2.2	1.6	1,000
			(no. of sites)	-	-	-	(1,942)	(2,313)	(2,282)	(2,128)	(1,983)	(1,314)	(1,159)	(991)	(831)	(717)	(714)	(674)	(654)	(647)	(603)	
		vicinity of sources	average	-	-	-	11	11	4.7	8.4	6	17	5	4.3	4.1	3.5	5.4	6.7	5.0	7.0	4.0	
			(no. of sites)	-	-	-	(1,089)	(1,422)	(1,018)	(931)	(635)	(468)	(346)	(294)	(242)	(259)	(284)	(295)	(263)	(274)	(269)	

EQSs: Environmental quality standards

(Air)

Note 1: From FY1997 to FY 1999, the data is the results of environmental air monitor survey under the Air Pollution Control Law (The survey results of old Environment Agency are included).

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

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

Note 4:In principle, before FY 1998, when the concentration measurement of each isomer is less than minimum limit of determination, the toxicity equivalent has been calculated as zero.
After FY 1999, when the concentration measurement of each isomer is less than minimum limit of determination and it is more than the detection lower bound, toxicity equivalent is calculated as it is. When it is less than the detection lower bound, the toxicity equivalent has been calculated by using the value of 1/2 of the detection lower bound for each isomer.

(Water quality of public waters and groundwater)

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

(2006) has been used after FY 2008.
Note 2: When the concentration measurement of each isomer is less than minimum limit of determination and it is more than the detection lower bound, toxicity equivalent is calculated as it is. When it is less than the detection lower bound, the toxicity equivalent has been calculated by using the value of 1/2 of the detection lower bound for each isomer.

(Soil)
Note 1: WHO-TEF(1998) has been used for the calculation of toxicity equivalent before FY 2007, and WHO-TEF (2006) has been used after FY 2008.
Note 2: When the concentration measurement of each isomer is less than minimum limit of determination, the toxicity equivalent has been calculated as zero.
Note 3: After FY 2009, results of sites using simplified assay are not included in the table above, by reason that the results can not be used for calculation of average, concentration range, etc.
Note4: The survey has been conducting according to the annual plan by the local governments. Number of survey sites for each year is not same.

Table 5: Concentration distributions of PCBs in water (FY 2014)

Local communities	Monitored sites	Concentrations (pg/L)
Hokkaido	KitakyushuIshikari kakokyo Bridge, Mouth of Riv. Ishikari	68
	Suzuran-ohashi Bridge, Riv Tokachi	120
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	49
Miyagi Pref.	Sendai Bay	54
Akita Pref.	Lake Hachiro	92
Yamagata Pref.	Mouth of Riv. Mogami	60
Fukushima Pref.	Onahama Port	78
Ibaraki Pref.	Kamome-ohasi Bridge, Mouth of Riv. Tone	100
Tochigi Pref.	Riv. Tagawa	150
Saitama Pref.	Akigaseshusui of Riv. Arakawa	140
Chiba City	Mouth of Riv. Hanami	200
Tokyo Met.	Mouth of Riv. Arakawa	1,800
	Mouth of Riv. Sumida	4,800
Yokohama City	Yokohama Port	460
Kawasaki City	Keihin Canal, Port of Kawasaki	910
Niigata Pref.	Lower Riv. Shinano	130
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	140
Ishikawa Pref.	Mouth of Riv. Sai	290
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	520
Nagano Pref.	Lake Suwa (center)	88
Shizuoka Pref.	Riv. Tenryu	80
Aichi Pref.	Nagoya Port	540
Mie Pref.	Yokkaichi Port	1,000

Local communities	Monitored sites	Concentrations (pg/L)
Shiga Pref.	Lake Biwa(center, offshore of Karasaki)	53
Kyoto Pref.	Miyazu Port	27
Kyoto City	Miyamae Bridge, Riv. Katsura	1,100
Osaka Pref.	Mouth of Riv. Yamato	360
Osaka City	Osaka Port	2,800
Hyogo Pref.	Offshore of Himeji	180
Kobe City	Kobe Port (center)	1,200
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	210
Okayama Pref.	Offshore of Mizushima	66
Hiroshima Pref.	Kure Port	180
	Hiroshima Bay	61
Yamaguchi Pref.	Tokuyama Bay	31
	Offshore of Ube	48
	Offshore of Hagi	21
Tokushima Pref.	Mouth of Riv. Yoshino	77
Kagawa Pref.	Takamatsu Port	390
Kochi Pref.	Mouth of Riv. Shimanto	16
Kitakyushu City	Dokai Bay	1,300
Saga Pref.	Imari Bay	29
Nagasaki Pref.	Omura Bay	20
Kumamoto Pref.	Riv. Midori	120
Miyazaki Pref.	Mouth of Riv. Oyodo	34
Kagoshima Pref.	Riv. Amori	17
	Gotanda-bashi Bridge, Riv. Gotanda	31
Okinawa Pref.	Naha Port	300

Table 6: Concentration distributions of PCBs in sediment (FY 2014)

Local communities	Monitored sites	Concentrations (pg/g-dry)
Hokkaido	Tomakomai Port	6,800
	Kitakyushulshikarikakokyo Bridge, Mouth of Riv. Ishikari	1,600
	Onnenai-ohashi Bridge, Riv. Teshio	110
	Suzuran-ohashi Bridge, Riv Tokachi	45
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	110
Miyagi Pref.	Sendai Bay	5,100
Sendai City	Hirose-ohashi Bridge, Riv. Hirose	430
Akita Pref.	Lake Hachiro	410
Yamagata Pref.	Mouth of Riv. Mogami	1,400
Fukushima Pref.	Onahama Port	31,000
Ibaraki Pref.	Kamome-ohasi Bridge, Mouth of Riv. Tone	1,600
Tochigi Pref.	Riv. Tagawa	720
Chiba Pref.	Coast of Ichihara and Anegasaki	23,000
Chiba City	Mouth of Riv. Hanami	620
Tokyo Met.	Mouth of Riv. Arakawa	67,000
	Mouth of Riv. Sumida	380,000
Yokohama City	Yokohama Port	140,000
Kawasaki City	Mouth of Riv. Tama	160,000
	Keihin Canal, Port of Kawasaki	160,000
Niigata Pref.	Lower Riv. Shinano	770
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	1,500
Ishikawa Pref.	Mouth of Riv. Sai	6,300
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	120
Yamanashi Pref.	Senshu-bashi Bridge, Riv. Arakawa	110
Nagano Pref.	Lake Suwa (center)	8,800
Shizuoka Pref.	Shimizu Port	18,000
	Riv. Tenryu	260
Aichi Pref.	Kinuura Port	17,000
	Nagoya Port	39,000

Local communities	Monitored sites	Concentrations (pg/g-dry)
Mie Pref.	Yokkaichi Port	70,000
	Toba Port	13,000
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)	14,000
	Lake Biwa(center, offshore of Karasaki)	18,000
Kyoto Pref.	Miyazu Port	1,600
Kyoto City	Miyamae Bridge, Riv. Katsura	3,800
Osaka Pref.	Mouth of Riv. Yamato	12,000
Osaka City	Osaka Port	440,000
	Outside Osaka Port	140,000
	Mouth of Riv. Yodo	92,000
	Riv. Yodo	55,000
Hyogo Pref.	Offshore of Himeji	17,000
Kobe City	Kobe Port (center)	260,000
Nara Pref.	Riv. Yamato	820
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	1,600
Okayama Pref.	Offshore of Mizushima	2,400
Hiroshima Pref.	Kure Port	78,000
	Hiroshima Bay	23,000
Yamaguchi Pref.	Tokuyama Bay	4,900
	Offshore of Ube	5,500
	Offshore of Hagi	1,400
Tokushima Pref.	Mouth of Riv. Yoshino	390
Kagawa Pref.	Takamatsu Port	33,000
Ehime Pref.	Niihama Port	980
Kochi Pref.	Mouth of Riv. Shimanto	1,300
Kitakyushu City	Dokai Bay	230,000
Fukuoka City	Hakata Bay	8,800
Saga Pref.	Imari Bay	4,800
Nagasaki Pref.	Omura Bay	6,700
Oita Pref.	Mouth of Riv. Oita	470
Miyazaki Pref.	Mouth of Riv. Oyodo	38
Kagoshima Pref.	Riv. Amori	35
	Gotanda-bashi Bridge, Riv. Gotanda	120
Okinawa Pref.	Naha Port	120,000

Table 7: Measurement situation of PCBs in public water and groundwater (FY 2014)

	Public water									Ground water	
	River		Lakes and Reservoirs		Sea waters		All sites				
	a: no. of location exceeding EQSs	b: no. of location surveyed	a: no. of location exceeding EQSs	b: no. of location surveyed	a: no. of location exceeding EQSs	b: no. of location surveyed	a: no. of location exceeding EQSs	b: no. of location surveyed	a/b (%)	no. of wells exceeding EQSs	no. of wells surveyed
PCB	0	1,745	0	145	0	421	0	2,311	0	0	2,022

EQSs: Environmental quality standards

Table 8: Concentration distributions of Chlordanes in fish (FY 2013)

Local communities	Monitored sites	Wildlife species	Concentrations (pg/g-wet)
Hokkaido	Offshore of Kushiro	Rock greenling	350
	Offshore of Kushiro	Chum salmon	440
	Offshore of Japan Sea (offshore of Iwanai)	Greenling	950
Iwate Pref.	Yamada Bay	Greenling	1,700
Miyagi Pref.	Sendai Bay	Greenling	1,300
Ibaraki Pref.	Offshore of Joban	Pacific saury	1,500
Tokyo Met.	Tokyo Bay	Sea bass	5,500
Kawasaki City	Offshore of Ogishima Island, Port of Kawasaki	Sea bass	3,800
Nagoya City	Nagoya Port	Striped mullet	4,800
Shiga Pref.	Lake Biwa, Riv. Azumi	Dace	9,400
Osaka Pref.	Osaka Bay	Sea bass	20,000
Hyogo Pref.	Offshore of Himeji	Sea bass	6,700
Tottori Pref.	Nakaumi	Sea bass	1,900
Hiroshima City	Hiroshima Bay	Sea bass	2,200
Kagawa Pref.	Takamatsu Port	Striped mullet	5,400
Kochi Pref.	Mouth of Riv. Shimanto	Sea bass	1,000
Oita Pref.	Mouth of Riv. Oita	Sea bass	7,800
Kagoshima Pref.	West Coast of Satsuma Peninsula	Sea bass	590
Okinawa Pref.	Nakagusuku Bay	Okinawa seabeam	2,700

Table 9: Concentration distributions of Chlordanes in sediment (FY 2013)

Local communities	Monitored sites	Concentrations (pg/g-dry)
Hokkaido	Onnenai-ohashi Bridge, Riv. Teshio	180
	Suzuran-ohashi Bridge, Riv Tokachi	24
	KitakyushuIshikarikakokyo Bridge, Mouth of Riv. Ishikari	300
	Tomakomai Port	73
Iwate Pref.	Riv. Toyosawa	7.2
Miyagi Pref.	Sendai Bay	160
Sendai City	Hirose-ohashi Bridge, Riv. Hirose	62
Akita Pref.	Lake Hachiro	52
Yamagata Pref.	Mouth of Riv. Mogami	120
Fukushima Pref.	Onahama Port	790
Ibaraki Pref.	Kamome-ohasi Bridge, Mouth of Riv. Tone	170
Tochigi Pref.	Riv. Tagawa	250
Chiba Pref.	Coast of Ichihara and Anegasaki	590
Chiba City	Mouth of Riv. Hanami	330
Tokyo Met.	Mouth of Riv. Arakawa	4,300
	Mouth of Riv. Sumida	8,600
Yokohama City	Yokohama Port	790
Kawasaki City	Mouth of Riv. Tama	5,100
	Keihin Canal, Port of Kawasaki	940
Niigata Pref.	Lower Riv. Shinano	130
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu	240
Ishikawa Pref.	Mouth of Riv. Sai	1,200
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono	21
Yamanashi Pref.	Senshu-bashi Bridge, Riv. Arakawa	31
Nagano Pref.	Lake Suwa (center)	800
Shizuoka Pref.	Shimizu Port	160
	Riv. Tenryu	54
Aichi Pref.	Kinuura Port	240
	Nagoya Port	350
Mie Pref.	Yokkaichi Port	380
	Toba Port	140

Local communities	Monitored sites	Concentrations (pg/g-dry)
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)	1,400
	Lake Biwa (center, offshore of Karasaki)	280
Kyoto Pref.	Miyazu Port	19
Kyoto City	Miyamae Bridge, Riv. Katsura	45
Osaka Pref.	Mouth of Riv. Yamato	5,000
Osaka City	Kema-bashi Bridge, Riv. Oh-kawa	4,200
	Mouth of Riv. Yodo (Osaka City)	2,000
	Osaka Port	3,300
	Outside Osaka Port	330
Hyogo Pref.	Offshore of Himeji	390
Kobe City	Kobe Port (center)	360
Nara Pref.	Riv. Yamato	630
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa	26
Okayama Pref.	Offshore of Mizushima	37
Hiroshima Pref.	Kure Port	410
	Hiroshima Bay	260
Yamaguchi Pref.	Tokuyama Bay	85
	Offshore of Ube	110
	Offshore of Hagi	33
Tokushima Pref.	Mouth of Riv. Yoshino	37
Kagawa Pref.	Takamatsu Port	15,000
Ehime Pref.	Niihama Port	93
Kochi Pref.	Mouth of Riv. Shimanto	150
Kitakyushu City	Dokai Bay	490
Fukuoka City	Hakata Bay	210
Saga Pref.	Imari Bay	120
Nagasaki Pref.	Omura Bay	130
Oita Pref.	Mouth of Riv. Oita	200
Miyazaki Pref.	Mouth of Riv. Oyodo	33
Kagoshima Pref.	Riv. Amori	37
	Gotanda-bashi Bridge, Riv. Gotanda	390
Okinawa Pref.	Naha Port	19,000

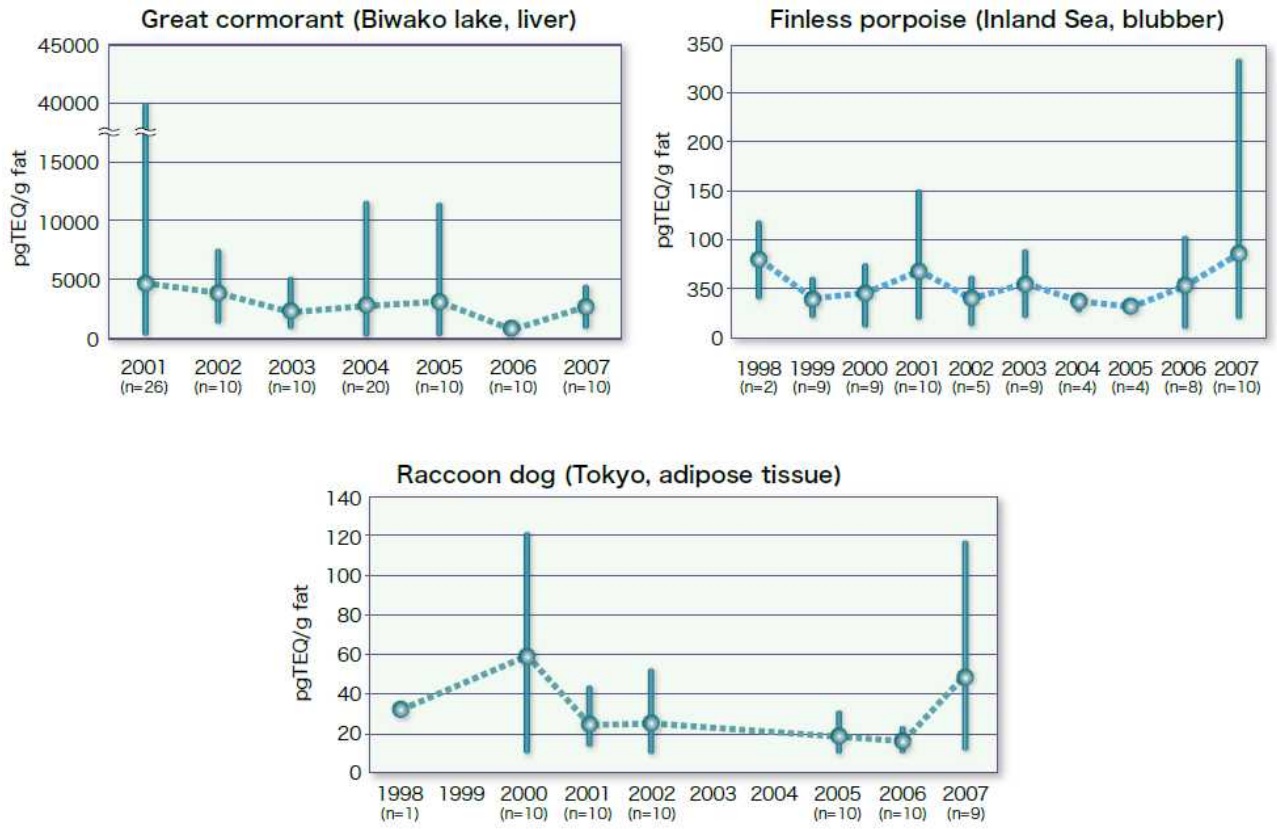


Figure 1: Temporal trends of dioxin concentrations in Japanese wildlife
(maximum – average – minimum)

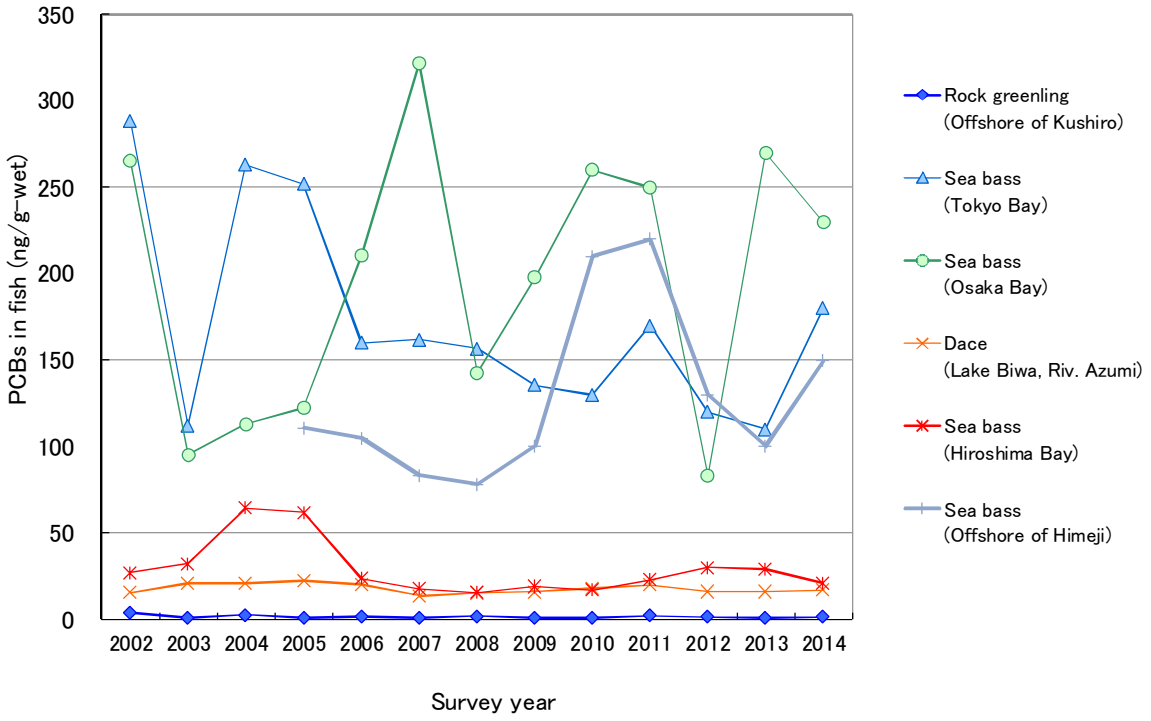


Figure 2: Temporal trends of PCBs concentrations in fish

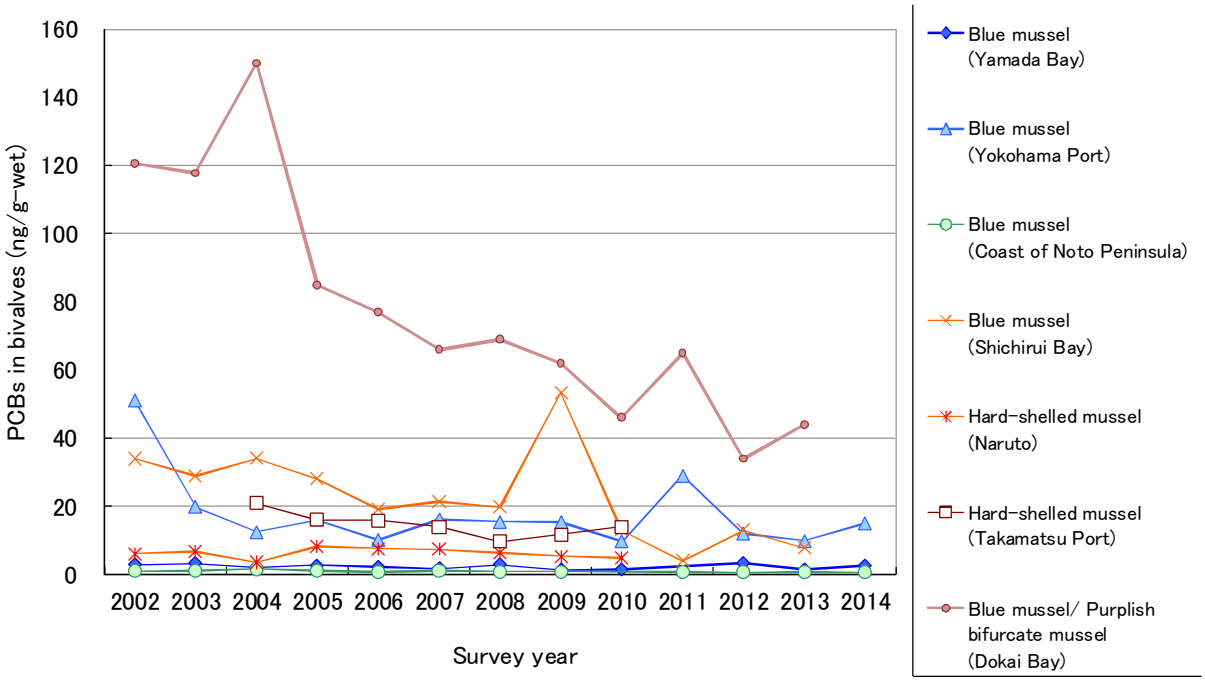
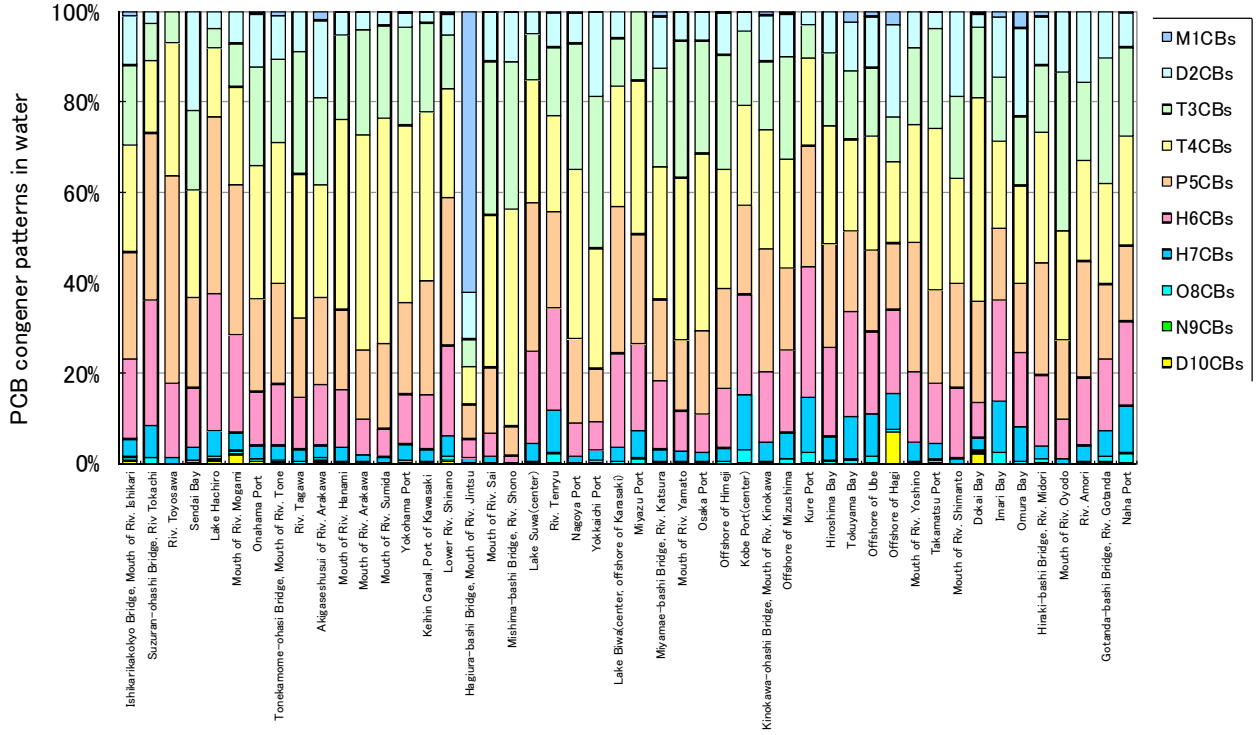


Figure 3: Temporal trends of PCBs concentrations in bivalves



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

Figure 4: Ratio by site of analogues in PCBs concentrations in water (FY 2014)

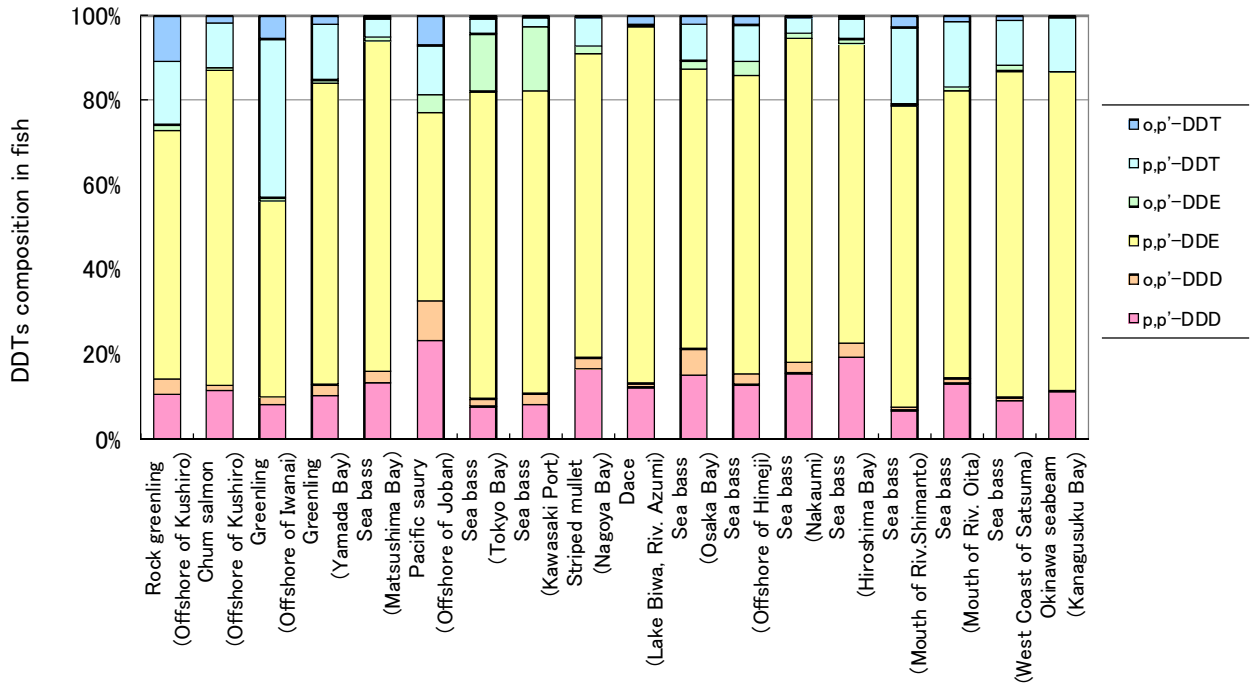


Figure 5: DDTs composition in fish (FY 2013)

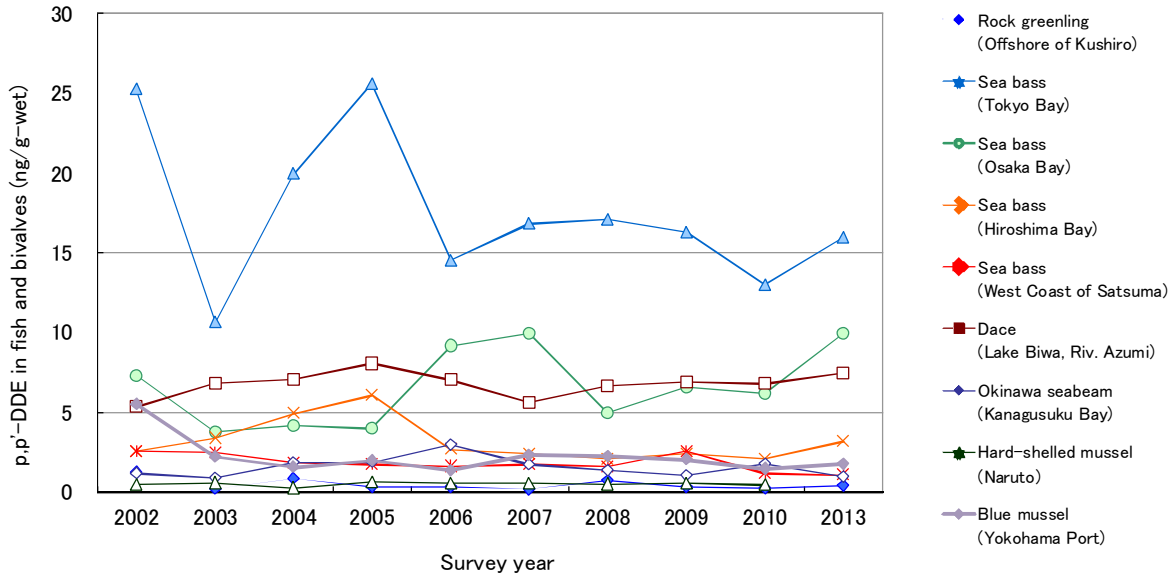


Figure 6: Temporal trends of p,p'-DDE concentrations in fish and bivalves

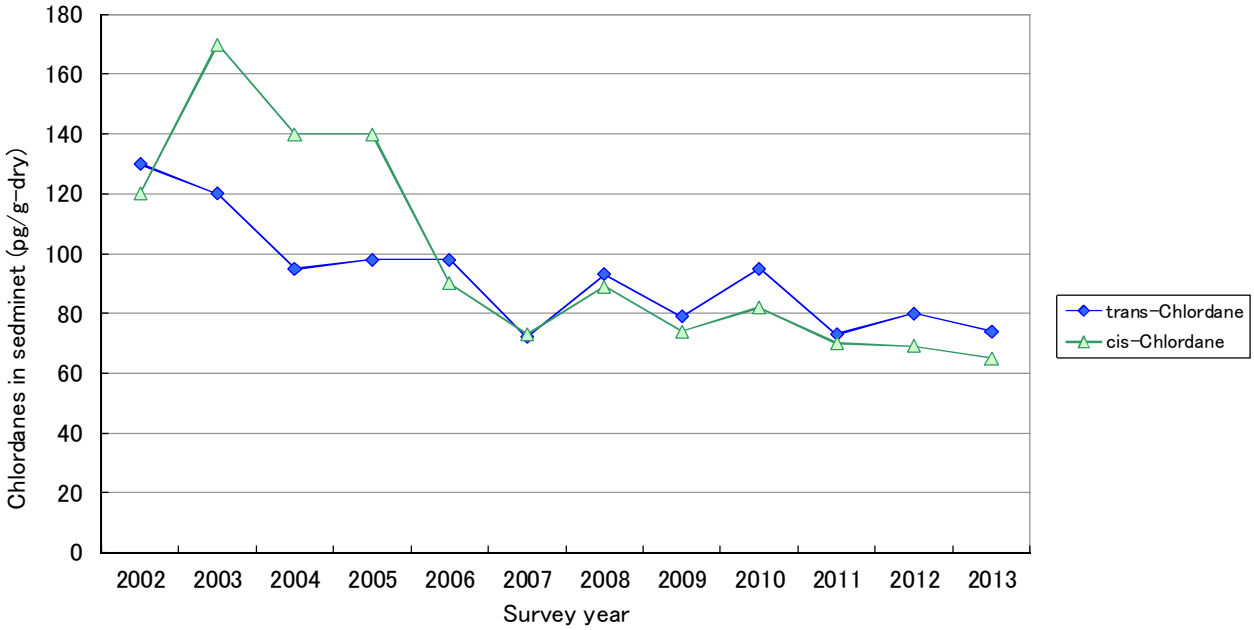


Figure 7: Temporal trends of Chlordanes concentrations in sediment

2. Government Plan to Reduce Dioxins Levels Resulting from Business Activities in Japan
(Modified in August 2012)

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 2 Measures for businesses in order to achieve reduction targets

1. Compliance with emission standards, etc.

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

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

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

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

(2) Prevention of environmental pollution by dioxins

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

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

(3) Measures in case of accidents

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

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

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

(5) Appointment of pollution control supervisors etc.

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

2. Report dioxins releases etc. by businesses

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

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

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

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

Recycling etc. of End-of-Life Motor Vehicles (Law No.78 of 2002), etc. and shall further promote minimizing waste as well as the cyclical use of recyclable resources through their voluntary and active endeavors.

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

1. Promotion of measures for waste reduction

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

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

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

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

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

In addition, by formulating a basic policy and taking necessary steps in compliance with the Law for Promotion of Effective Utilization of Resources, the Law for Promotion of Sorted Collection and Recycling of Containers and Packaging, the Specified Household Instruments Recycling Law, the Law Concerning the Recycling of Construction Materials, the Law for

Promoting the Recycling of Recyclable Food Resources, etc., the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and other Entities, the Law Concerning the Recycling etc. of End-of-Life Motor Vehicles, the national government and local public authorities shall promote waste reduction and the cyclical use of recyclable resources.

(3) Assistance to equipment investment required for waste reduction

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

2. Achievement of waste reduction targets

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

3. Others

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

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

(2) Enhancement of environmental education/learning

Under the Recycling Law, the national government shall promote a wide range of integrated environmental education/learning, designed for cutting back on the amount of waste etc., including promotion of reduction, reuse and recycling of wastes etc.. For this end, exchanges of personnel and information shall be promoted between the public sector and the private sector. The national government shall enhance the supply and diffusion of information,

personnel training, and educational programs etc., in order to ensure that environmental education/learning including that designed to reduce waste etc. discharges within the family, at schools, in workplaces, in local communities, and any other places. etc. under the Law for Enhancing Motivation on Environmental Conservation and Promoting Environmental Education (Law No.130 of 2003). The local public authorities shall endeavor to plan and implement measures regarding the promotion of environmental education.

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

1. Appropriate and smooth implementation of the Stockholm Convention

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

2. Promotion of measures for sources of dioxins

(1) Promotion of measures against waste

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

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

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

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

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

associated with waste disposal.

(2) Promotion of measures against unregulated sources etc.

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

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

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

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

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

3. Report of dioxins emissions etc.

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

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

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

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

The government shall annually and continuously monitor the status of dioxins in the environment, human bodies, waste incinerators and industries in a systematic manner, and

publish the results to the public in a way easy to understand.

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

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

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

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

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

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

The national government shall promote the analysis of the dioxins generation and emission mechanism, research on effects on organisms and behavior of dioxins in the environment, and development of technologies for appropriate incineration, detoxification, and decomposition of wastes, and also promote the introduction and diffusion of achievements of such technologies to push forward their use under appropriate circumstances.

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

(1) Enhancement of publication and disclosure of information

The national government shall disclose and publish to the public accurate information concerning the impacts of dioxins on the human health and the environment, the results of research and development and international trends, including the relevant statistical data and

their actual implications, in a prompt and easily understandable manner.

(2) Systematic activities designed to enhance public awareness

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

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

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

[Reference] Dioxins emissions inventory

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

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

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

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

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