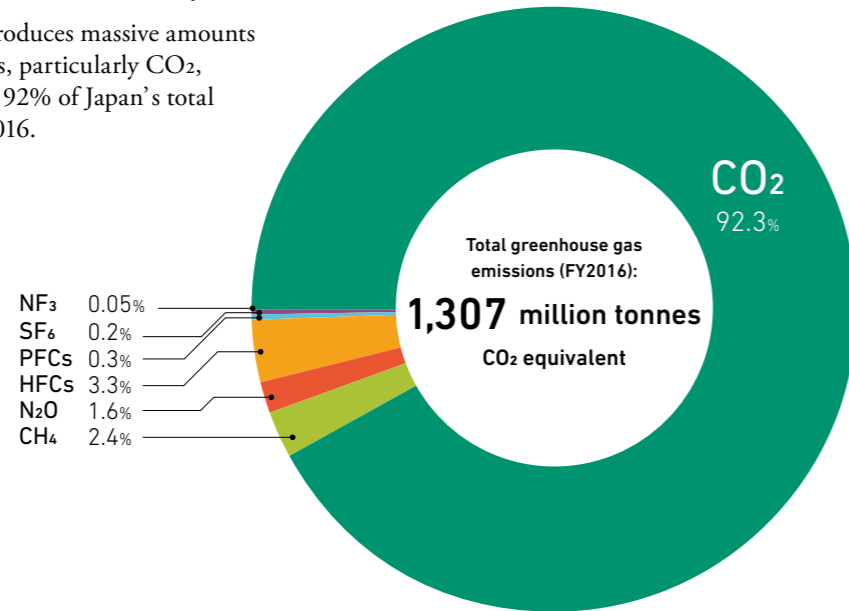


ADDITIONAL MATERIALS FROM THE 2018 ANNUAL REPORT ON THE ENVIRONMENT

Breakdown of Greenhouse Gas Emissions in Japan (FY2016)

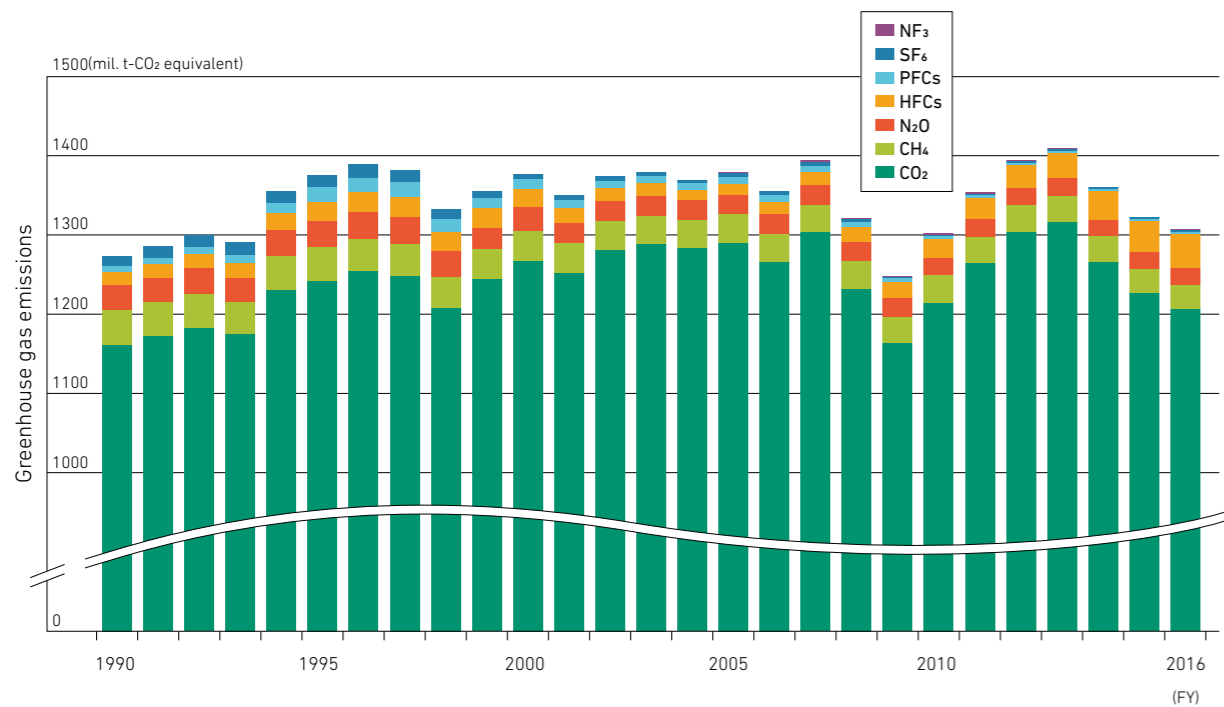
Globally, fossil fuel combustion produces massive amounts of anthropogenic greenhouse gases, particularly CO₂, which accounts for approximately 92% of Japan's total greenhouse gas emissions in FY 2016.



Source: Ministry of the Environment

Greenhouse Gas Emissions in Japan

Japan's total greenhouse gas emissions in FY 2016 were equivalent to approximately 1,307 million tonnes of CO₂, a 1.2% drop from the previous year. This was due to the decrease in energy consumption through energy conservation, and the increase in the share of non-fossil fuels within the domestic energy supply.



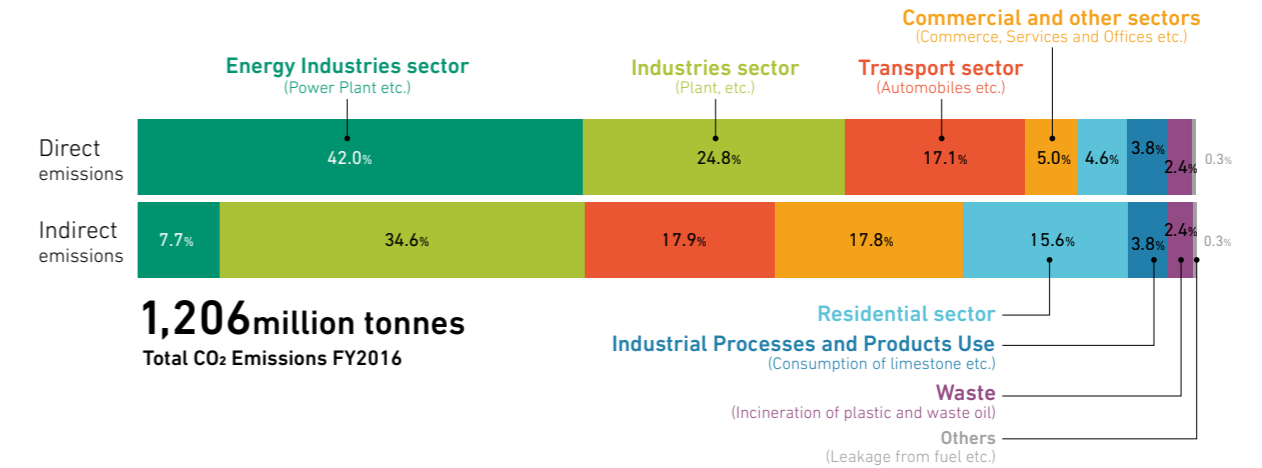
Source: Ministry of the Environment

Low-carbon society

Additional materials provide more details about the global warming issue.

Breakdown of CO₂ Emissions by Sector

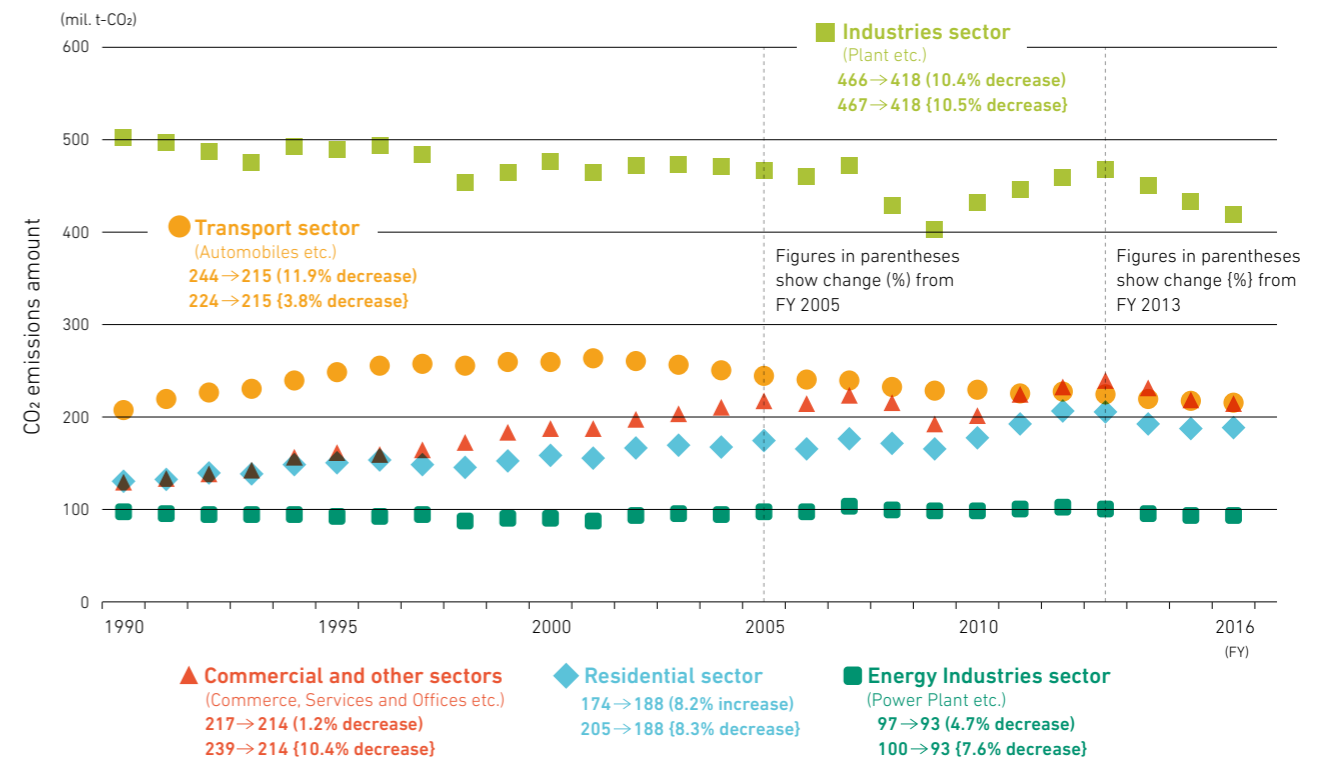
The sector with the largest CO₂ emissions in indirect emissions in FY 2016 was industries sector, accounting for approximately 34.6% of Japan's total.



Source: Ministry of the Environment

Energy originated CO₂ Emissions by Sector (Indirect Emissions)

Plotting energy originated CO₂ emissions by sector reveals that emissions in every sector decreased from FY 2013.



Source: Ministry of the Environment

ADDITIONAL MATERIALS FROM THE 2018 ANNUAL REPORT ON THE ENVIRONMENT

Biodiversity

Additional materials provide more details about biodiversity in Japan.

Threatened Species in Japan

With an increasing number of species being put on the Red List, which publicizes threatened species, it is clear that the circumstances of wild fauna and flora in Japan continue to be severe.

(Reported in May 2018)

Taxon	Species Targeted for Evaluation	Extinct EX	Extinct in the Wild EW	Threatened Species			Near Threatened NT	Data Deficient DD	Total of listed species	Endangered Local Population LP
				Endangered Class I		Endangered Class II VU				
				Class IA CR	Class IB EN					
Fauna										
Mammals	160 (160)	7 (7)	0 (0)	33(33) 24(24) / 12(12)		9(9)	18 (18)	5 (5)	63 (63)	23 (23)
Birds	Approx. 700 (Approx. 700)	15 (13)	1 (1)	97(97) 54(54) / 23(23)		43(43)	21 (21)	17 (19)	151 (151)	2 (2)
Reptiles	100 (100)	0 (0)	0 (0)	37(37) 14(13) / 5(4)		23(24)	17 (17)	4 (4)	58 (58)	5 (5)
Amphibians	77 (76)	0 (0)	0 (0)	29(28) 17(15) / 4(3)		12(13)	22 (22)	1 (1)	52 (51)	0 (0)
Brackish water and freshwater fish	Approx. 400 (Approx. 400)	3 (3)	1 (1)	169(169) 125(125) / 71(71)		44(44)	35 (34)	37 (35)	245 (242)	15 (15)
Insects	Approx. 32,000 (Approx. 32,000)	4 (4)	0 (0)	363(358) 177(173) / 71(68)		186(185)	350 (352)	153 (153)	870 (867)	2 (2)
Shellfish	Approx. 3,200 (Approx. 3,200)	19 (19)	0 (0)	616(587) 288(264) / 33(13)		328(323)	445 (446)	89 (89)	1169 (1141)	13 (13)
Other invertebrates	Approx. 5,300 (Approx. 5,300)	0 (0)	1 (1)	65(63) 22(21) / 0(0)		43(42)	42 (42)	43 (42)	151 (148)	0 (0)
Subtotal of Fauna		48 (46)	3 (3)	1409(1372) 721(689)		688(683)	950 (952)	349 (348)	2759 (2721)	60 (60)
Flora										
Vascular plants	Approx. 7,000 (Approx. 7,000)	28 (28)	11 (11)	1786(1782) 1045(1041) / 525(522)		741(741)	297 (297)	37 (37)	2159 (2155)	0 (0)
Bryophytes	Approx. 1,800 (Approx. 1,800)	0 (0)	0 (0)	241(241) 138(138)		103(103)	21 (21)	21 (21)	283 (283)	0 (0)
Algae	Approx. 3,000 (Approx. 3,000)	4 (4)	1 (1)	116(116) 95(95)		21(21)	41 (41)	40 (40)	202 (202)	0 (0)
Lichens	Approx. 1,600 (Approx. 1,600)	4 (4)	0 (0)	61(61) 41(41)		20(20)	41 (42)	46 (46)	152 (153)	0 (0)
Fungi	Approx. 3,000 (Approx. 3,000)	26 (26)	1 (1)	62(62) 39(39)		23(23)	21 (21)	50 (50)	160 (160)	0 (0)
Subtotal of Flora		62 (62)	13 (13)	2266(2262) 1358(1354)		908(908)	421 (422)	194 (194)	2956 (2953)	0 (0)
Total of thirteen taxonomic groups		110 (108)	16 (16)	3675(3634) 2079(2043)		1596(1591)	1371 (1374)	543 (542)	5715 (5674)	60 (60)

* Numerals within parentheses indicate the respective numbers of species (including subspecies, variety (only for flora) and form (only for algae and fungi)) from the Red List 2017. The numbers in the LP column are the numbers of local population. ** The number of species excluding those that cannot be evaluated by the naked eye.

The categories are considered as follows:

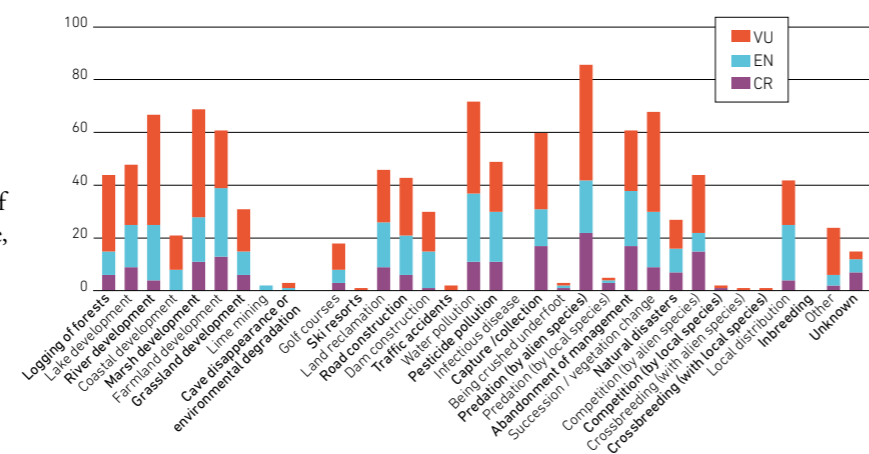
Extinct (EX): Species that are likely to already be extinct / Extinct in the Wild (EW): Species that exist only in captivity or as a naturalized population outside its natural habitat / Endangered Class I (Critically Endangered + Endangered) (CR+EN): Species that are threatened to extinction / Endangered Class IA (Critically Endangered) (CR): Species that are facing an extremely high risk of extinction in the wild in the near future / Endangered Class IB (Endangered) (EN): Species that are facing a high risk of extinction in the wild in the near future / Endangered Class II (Vulnerable) (VU): Species with an increasing risk of extinction / Near Threatened (NT): Species that are not currently endangered, but may possibly qualify for "endangered" status with changes in their habitat conditions / Data Deficient (DD): Species with data insufficient for adequate evaluation / Endangered Local Population (LP): Species with a population isolated regionally, and face a high risk of extinction

Source: Red List 2018 by the Ministry of the Environment

Drivers of Loss of Threatened Species (insects)

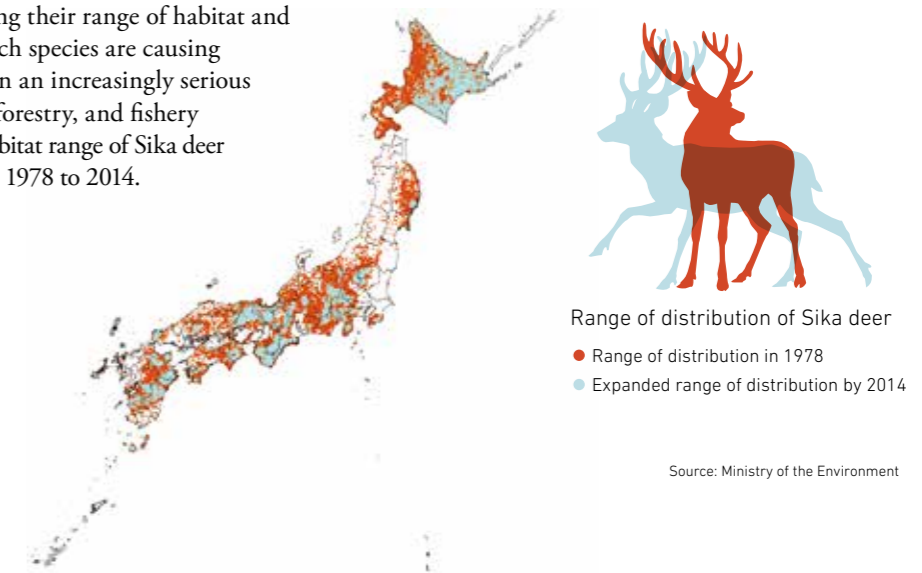
There are various drivers of loss of threatened species, but typical drivers include development, capture/collection, abandonment of management or succession, overuse, water pollution, and alien species.

Note: CR: Category IA, EN: Category IB, VU: Category II. Source: Ministry of the Environment



Growing Range of Sika Deer

While certain flora and fauna are endangered, there are also issues with other species, such as Sika deer and wild boar, that are rapidly expanding their range of habitat and growing their populations. Such species are causing increasing damage, resulting in an increasingly serious situation for the agricultural, forestry, and fishery industries. For example, the habitat range of Sika deer expanded approx. 2.5 fold from 1978 to 2014.

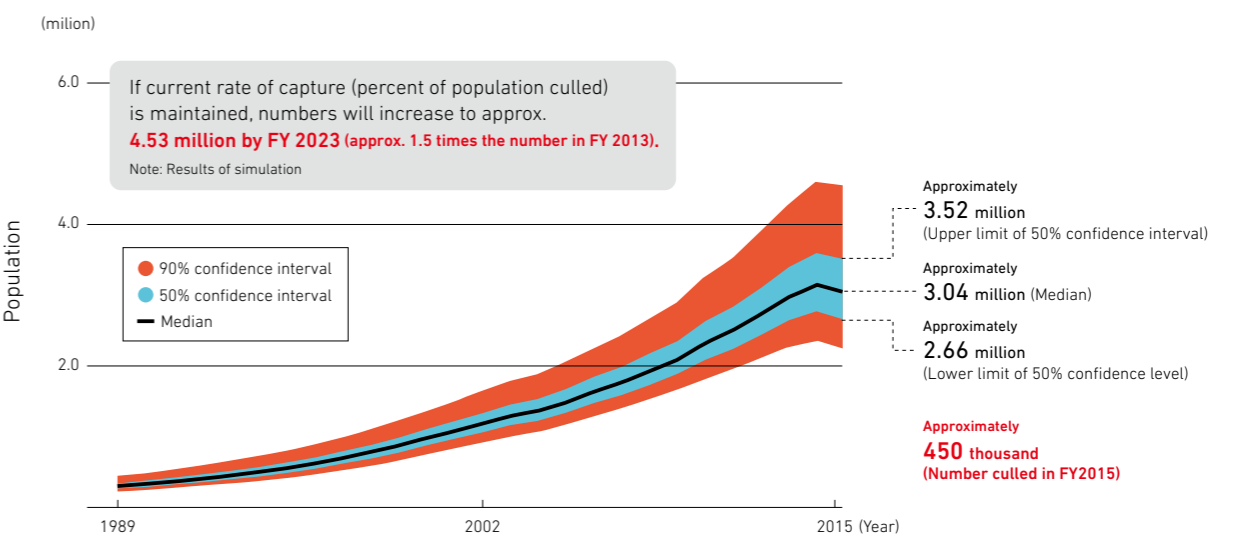


Range of distribution of Sika deer
● Range of distribution in 1978
● Expanded range of distribution by 2014

Source: Ministry of the Environment

Estimated Number of Sika Deer in Japan (excluding Hokkaido prefecture*)

Furthermore, the number of sika deer on the main Japanese island of Honshu and further south is forecast to increase to 1.4 times its 2011 level by 2023.

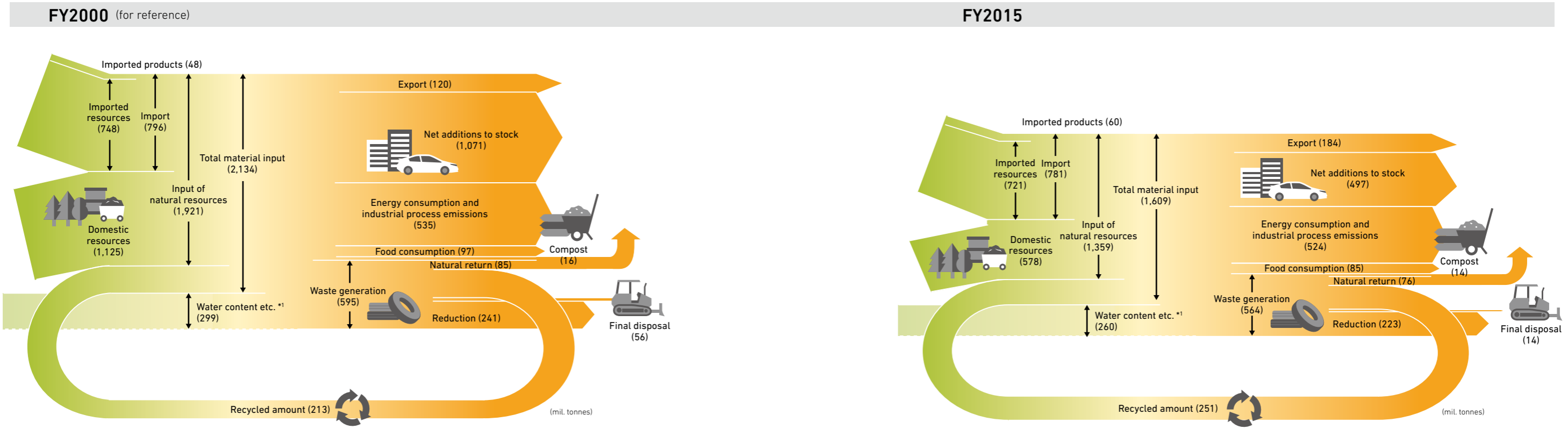


* In FY 2013, estimated number in Hokkaido was approx. 540,000, and number culled was approx. 130,000 (Hokkaido data).

Source: Ministry of the Environment

Material Flow in Japan

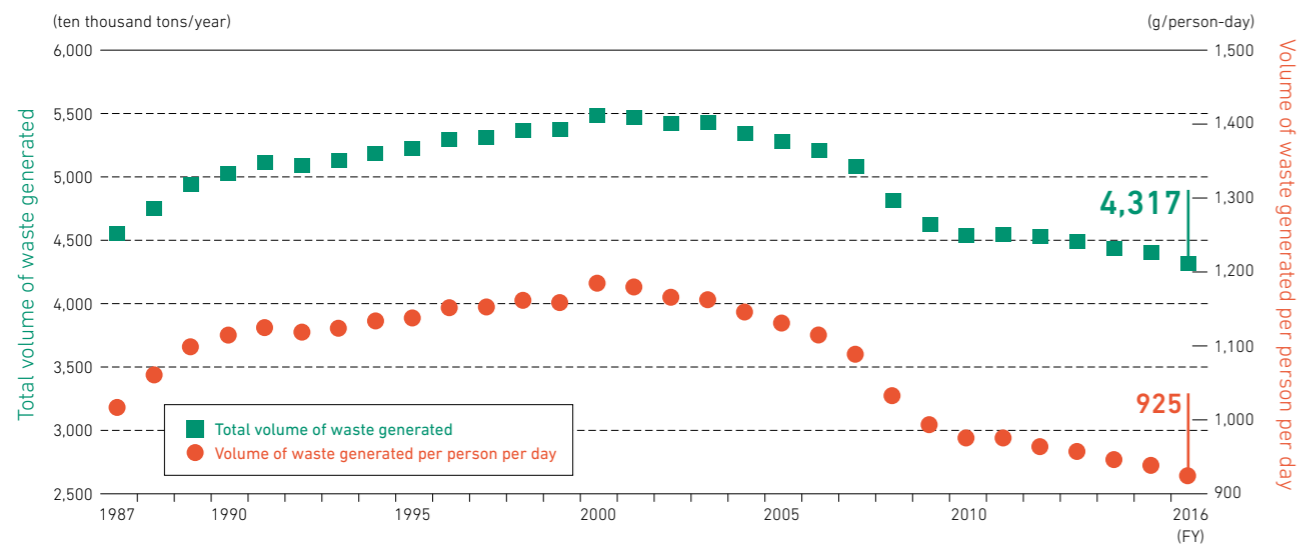
In order to establish a sound material-cycle society, it is necessary to comprehend material flows (or substance flows) to understand the extent of material extraction, consumption, and disposal in Japan. Japan uses material flows to determine targets for the three indicators of resource productivity, cyclical use rate, and final disposal amount.



*1 Water content: water contents of wastes (sludge, livestock waste, night soil, waste acid, waste alkali) and sediments dumped in association with the process of economic activities (sludge in mining, construction and in waterworks as well as slag)

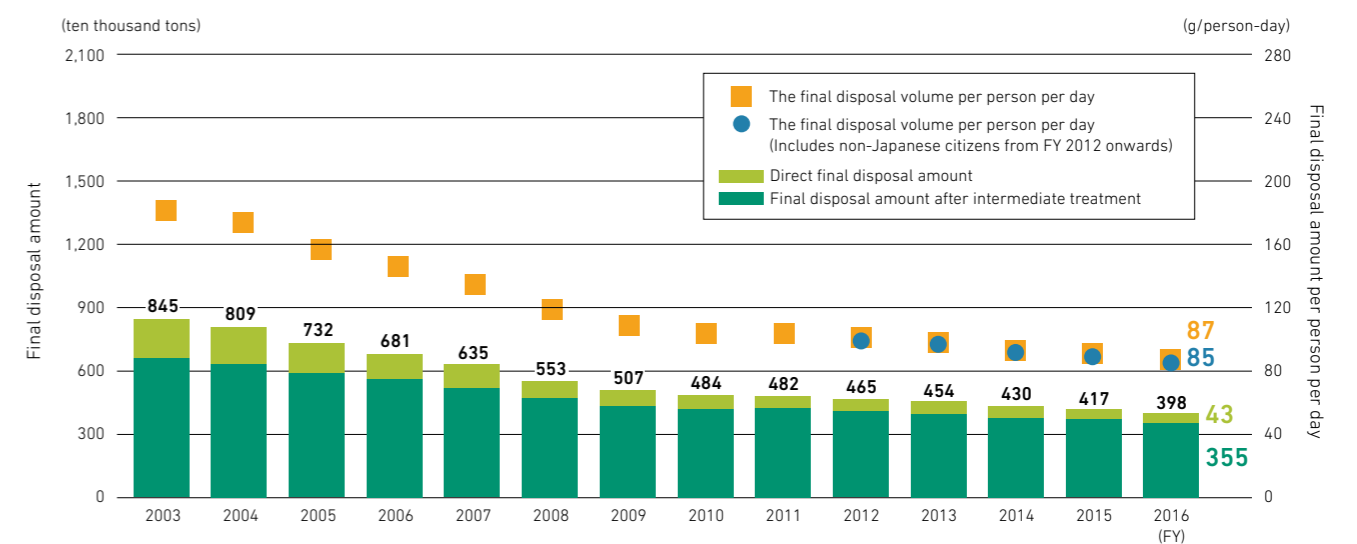
Total Volume of Waste Generation and Waste Volume Per Person Per Day

Total generated waste and waste generated per person per day are declining year by year.



Final Disposal Amount and Final Disposal Amount Per Person

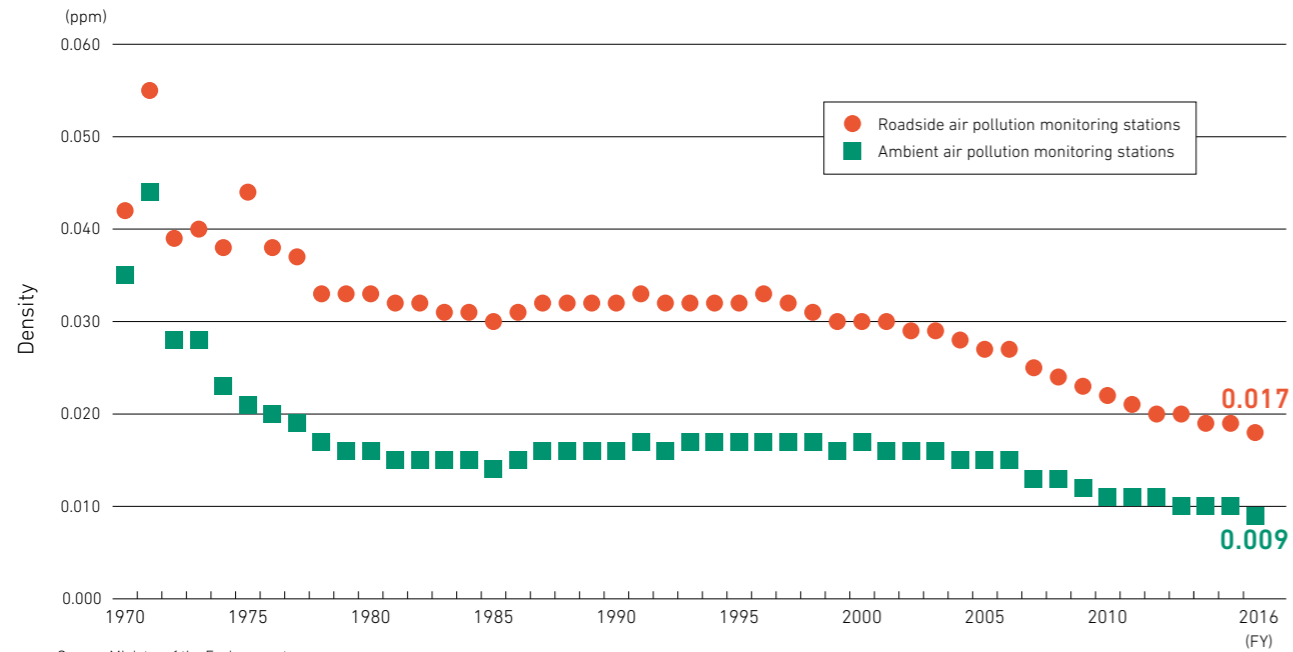
Final disposal amount of waste and final disposal amount per person per day are trending downwards.



Additional materials provide more information about atmospheric and water environments.

Annual Average Density of NO₂ (from FY1970 to FY2016)

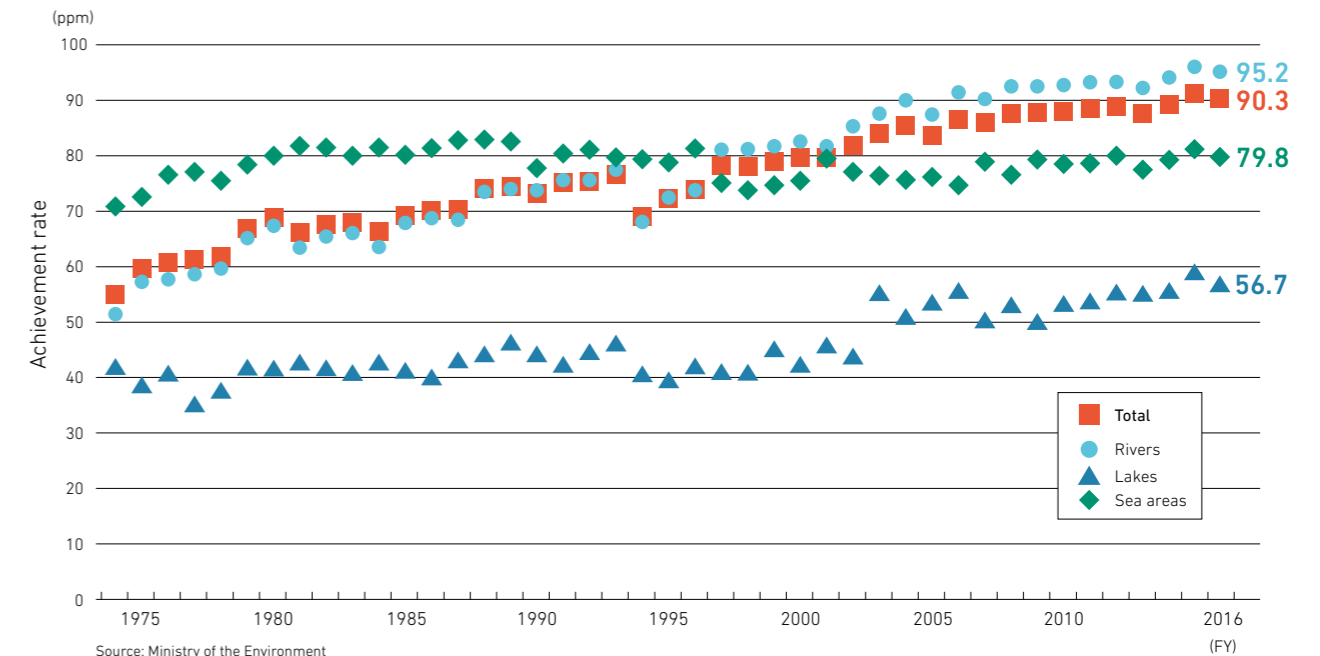
A gradual fall in mean nitrogen dioxide levels can be seen recently at both ambient air pollution monitoring stations and roadside air pollution monitoring stations.



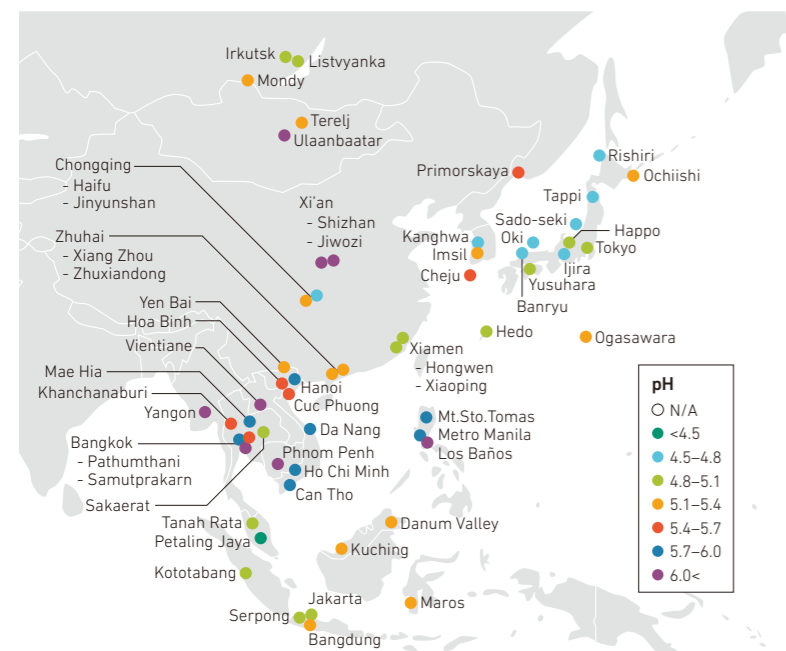
Source: Ministry of the Environment

Achievement of Environmental Standards (BOD or COD)

An overall level of 90.3% has been achieved for the biochemical oxygen demand (BOD) and chemical oxygen demand (COD) environmental standards relating to the maintenance of living environments. BOD and COD are leading indicators of water quality in respect of organic pollution.



Source: Ministry of the Environment



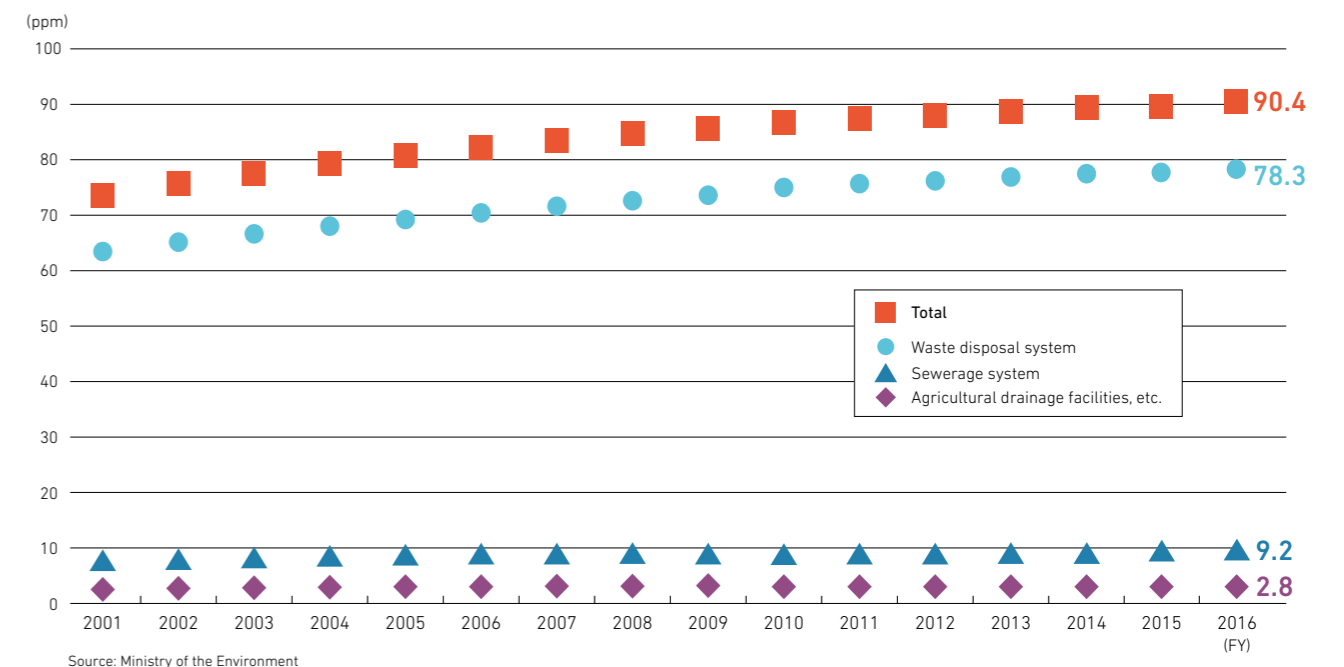
pH in Precipitation in EANET Region (Average pH 2013 - 2016)

The Acid Deposition Monitoring Network in East Asia (EANET) was established with the aim of establishing a regional cooperative framework regarding acid rain, and of making clear the state of the acid deposition issue and its impact in the East Asian region. Currently thirteen East Asia nations participate, collecting reliable data through acid deposition monitoring using the same methodology. The network will expand its range of operations to include PM_{2.5} and ozone monitoring.

Source: EANET "Data Report on the Acid Deposition in the East Asian Region 2016"

Coverage of Population Served by Waste Disposal System

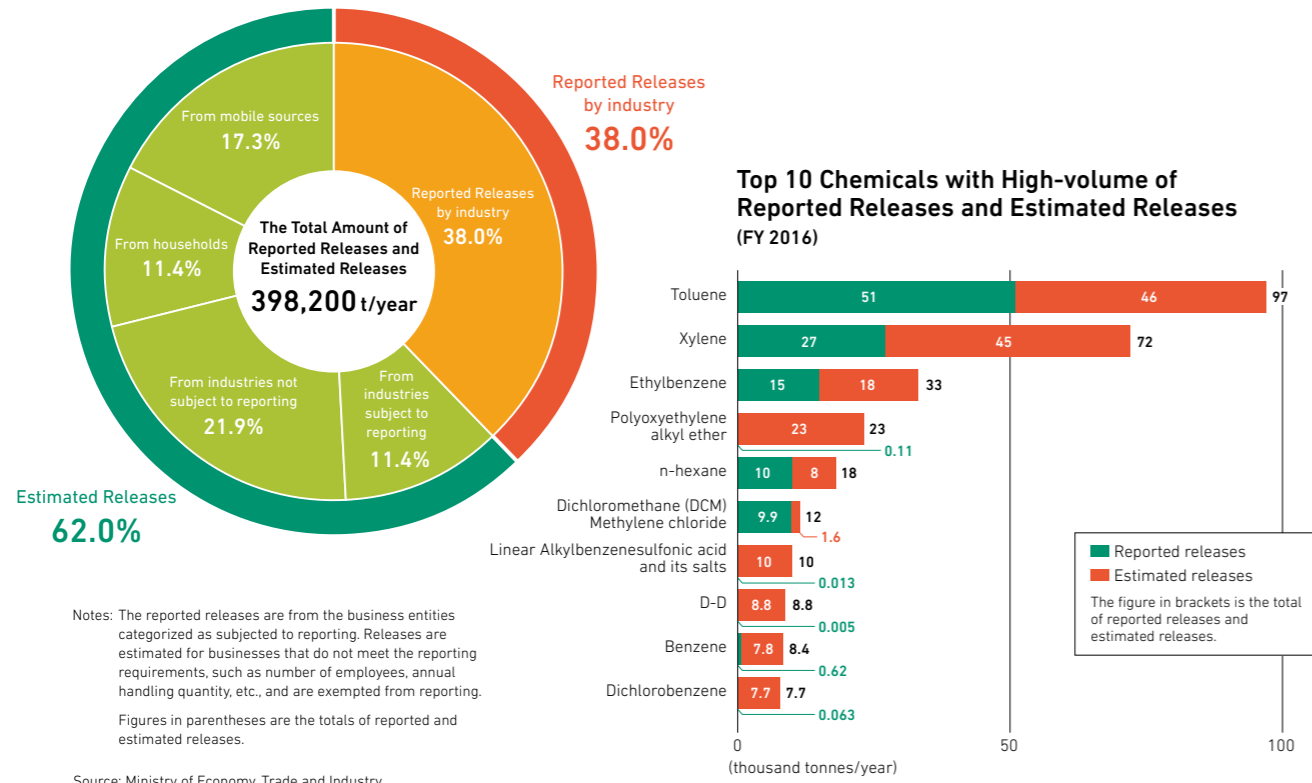
The population coverage of wastewater treatment systems in Japan is 90.4%. Wastewater treatment facilities are being installed to cover the population not yet served by the wastewater treatment systems.



Source: Ministry of the Environment

ADDITIONAL MATERIALS FROM THE 2018 ANNUAL REPORT ON THE ENVIRONMENT

Breakdown of Reported Releases by Industry and Estimated Releases of Chemical Substances in FY 2016



Notes: The reported releases are from the business entities categorized as subjected to reporting. Releases are estimated for businesses that do not meet the reporting requirements, such as number of employees, annual handling quantity, etc., and are exempted from reporting. Figures in parentheses are the totals of reported and estimated releases.

Source: Ministry of Economy, Trade and Industry and Ministry of the Environment

Source: Ministry of Economy, Trade and Industry and Ministry of the Environment

In March 2018, the government compiled data reported from businesses concerned on release and transfer of chemical substances complying with the Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (PRTR Law). Releases that were not subject to reporting were estimated.

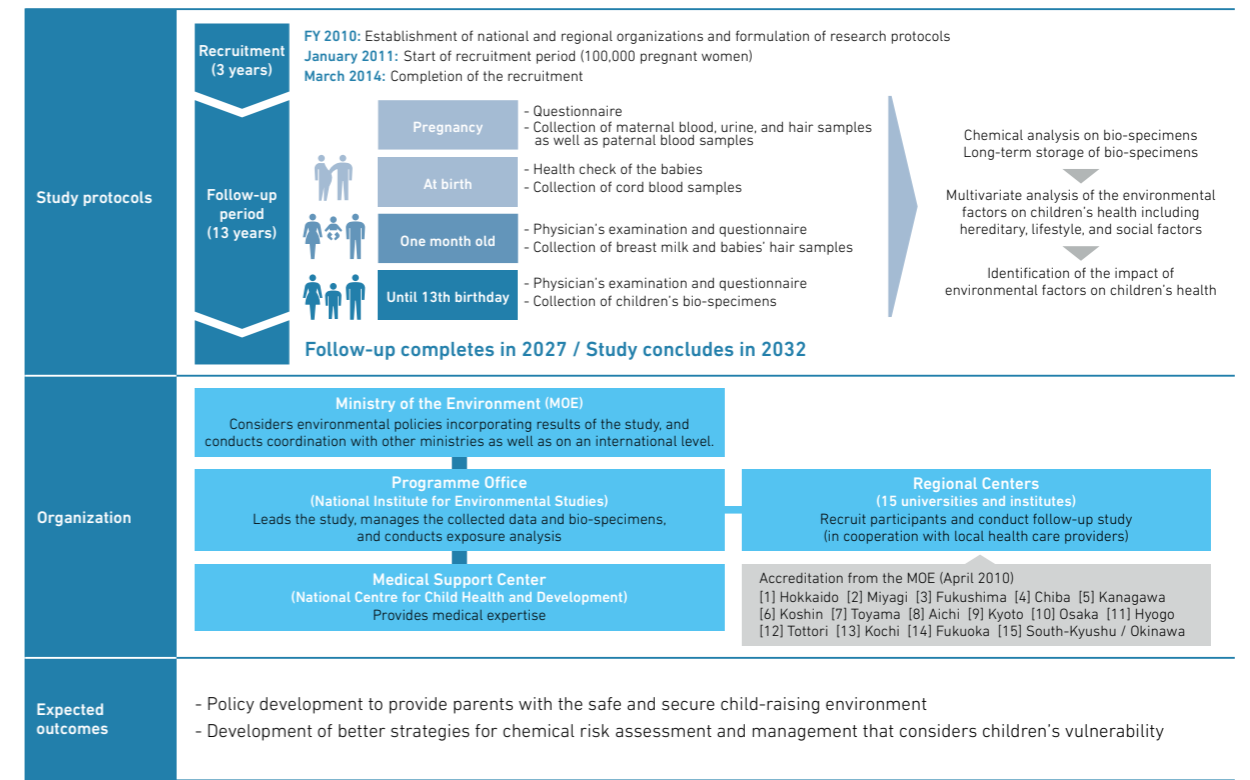
Environmental risks of chemical substances

The following data provides information on action regarding chemical substance emissions into the environment and initiatives for children's environmental health.

The Japan Environment and Children's Study (JECS)

The Japan Environment and Children's Study (JECS), a large-scale, long-term national birth cohort study involving 100,000 mother-child pairs, was launched in FY 2010. The Sub-cohort study, which includes home visits for environmental measurements, medical examinations and children's bio-specimen collection, began in November 2015, involving 5,000 participants selected from the Main Study.

JECS is a large-scale, long-term prospective cohort study to examine the impact of the exposure to chemical substances during pregnancy and childhood on children's health.



Source: Ministry of the Environment



Cover: Chubusangaku National Park

Chubusangaku National Park, established in December 1934 as one of the first national parks in Japan, is located in the region that spans Niigata, Toyama, Nagano and Gifu Prefectures. The park consists of mountains rising 3,000 meters above sea level and is rich in a spectacularly diverse landscape that fascinates visiting climbers. With the "Use Promotion Program 2020" developed in 2018 in the southern region, activities are conducted for a greater satisfaction of visitors from home and abroad.



Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2018

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