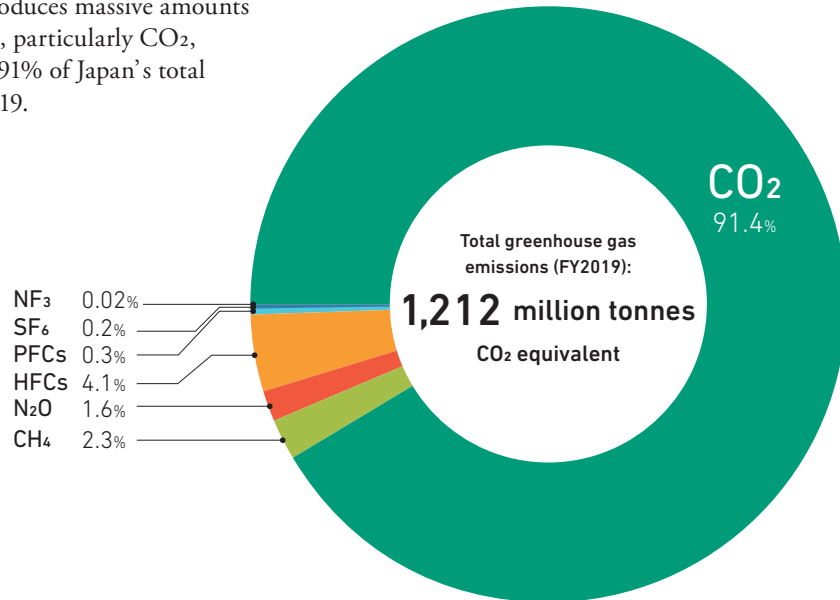


# ADDITIONAL MATERIALS FROM THE 2021 ANNUAL REPORT ON THE ENVIRONMENT

## Breakdown of Greenhouse Gas Emissions in Japan (FY2019)

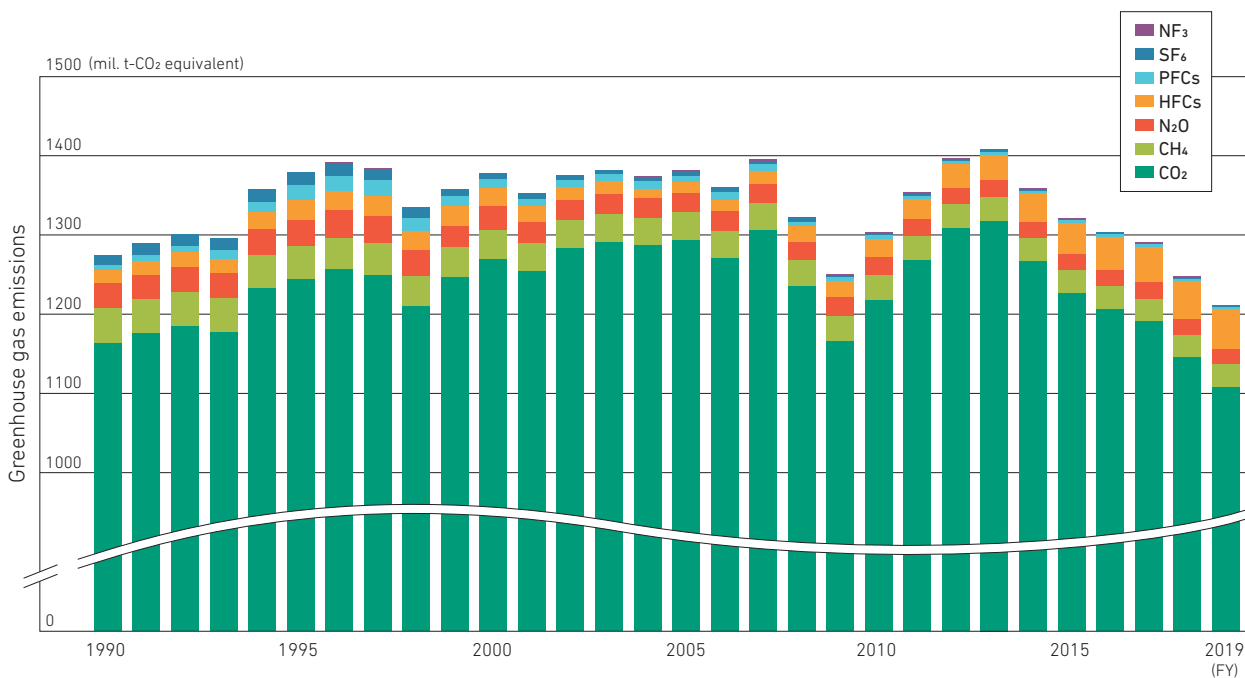
Globally, fossil fuel combustion produces massive amounts of anthropogenic greenhouse gases, particularly CO<sub>2</sub>, which accounts for approximately 91% of Japan's total greenhouse gas emissions in FY 2019.



Source: Ministry of the Environment

## Greenhouse Gas Emissions in Japan

Japan's total greenhouse gas emissions in FY 2019 were equivalent to approximately 1,212 million tonnes of CO<sub>2</sub>, a 2.9% drop from the previous year. Two main factors for the decrease are the decrease in energy consumption due to reduced production in manufacturing industries, and the increase in the share of renewable energy within electricity supply.



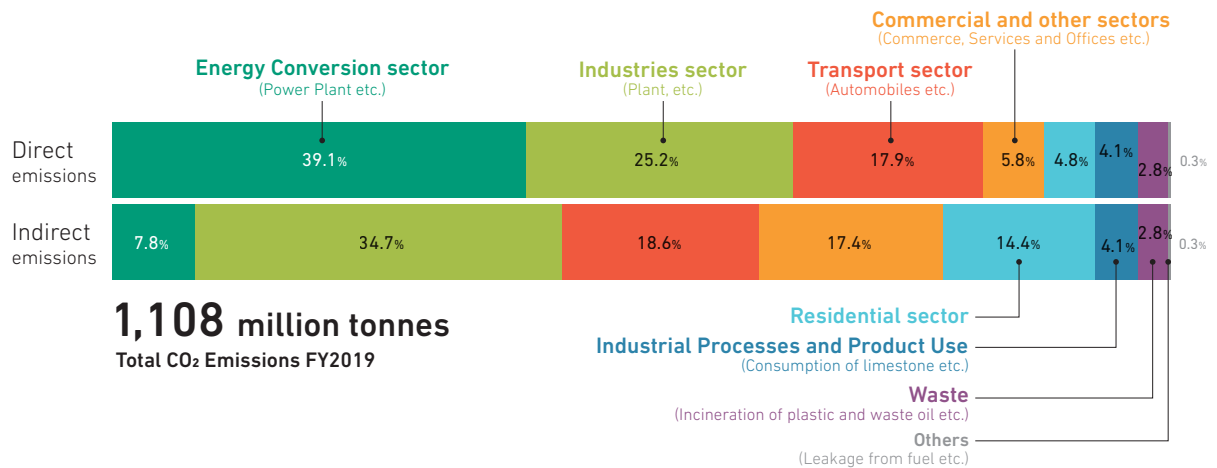
Source: Ministry of the Environment

# GHG Emissions in Japan

Additional materials provide more details about the GHG Emissions in Japan.

## Breakdown of CO<sub>2</sub> Emissions by Sector

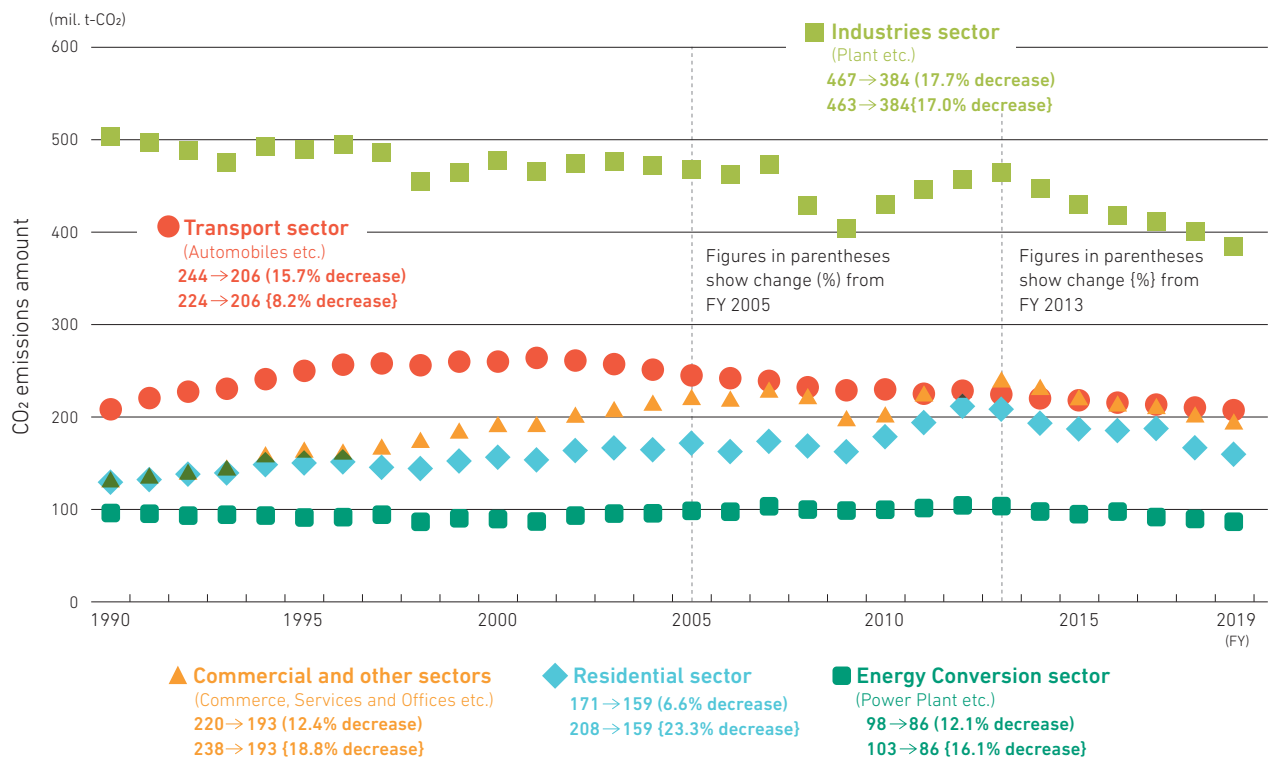
The sector with the largest CO<sub>2</sub> emissions in indirect emissions in FY 2019 was industries sector, accounting for approximately 34.7% of Japan's total.



Source: Ministry of the Environment

## Energy-related CO<sub>2</sub> Emissions by Sector (Indirect Emissions)

Plotting energy-related CO<sub>2</sub> emissions by sector reveals that emissions in every sector decreased from FY 2013.



Source: Ministry of the Environment

# ADDITIONAL MATERIALS FROM THE 2021 ANNUAL REPORT ON THE ENVIRONMENT

## 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 March 2020)

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)	34(33)			17 (18)	5 (5)	63 (63)	26 (23)
					25(24)		9(9)				
					12(12)	13(12)					
	Birds	Approx. 700 (Approx. 700)	15 (15)	0 (0)	98(98)			22 (21)	17 (17)	152 (151)	2 (2)
					55(55)		43(43)				
					24(24)	31(31)					
	Reptiles	100 (100)	0 (0)	0 (0)	37(37)			17 (17)	3 (4)	57 (58)	5 (5)
					14(14)		23(23)				
					5(5)	9(9)					
Amphibians	91 (76)	0 (0)	0 (0)	47(29)			19 (22)	1 (1)	67 (52)	0 (0)	
				25(17)		22(12)					
				5(4)	20(13)						
Brackish water and freshwater fish	Approx. 400 (Approx. 400)	3 (3)	1 (1)	169(169)			35 (35)	37 (37)	245 (245)	15 (15)	
				125(125)		44(44)					
				71(71)	54(54)						
Insects	Approx. 32,000 (Approx. 32,000)	4 (4)	0 (0)	367(363)			351 (350)	153 (153)	875 (870)	2 (2)	
				182(177)		185(186)					
				75(71)	107(106)						
Shellfish	Approx. 3,200 (Approx. 3,200)	19 (19)	0 (0)	629(616)			440 (445)	89 (89)	1177 (1169)	13 (13)	
				301(288)		328(328)					
				39(33)	28(16)						
Other invertebrates	Approx. 5,300 (Approx. 5,300)	1 (0)	0 (0)	65(65)			42 (42)	44 (44)	152 (151)	0 (0)	
				22(22)		43(43)					
				0(0)	2(2)						
<b>Subtotal of Fauna</b>		49 (48)	1 (1)	<b>1446(1410)</b>			943 (950)	349 (350)	2787 (2759)	63 (60)	
				749(722)		697(688)					
Flora	Vascular plants	Approx. 7,000 (Approx. 7,000)	28 (28)	11 (11)	1790(1786)			297 (297)	37 (37)	2163 (2159)	0 (0)
					1049(1045)		741(741)				
					529(525)	520(520)					
	Bryophytes	Approx. 1,800 (Approx. 1,800)	0 (0)	0 (0)	240(241)			21 (21)	21 (21)	282 (283)	0 (0)
					137(138)		103(103)				
	Algae	Approx. 3,000 (Approx. 3,000)	4 (4)	1 (1)	116(116)			41 (41)	40 (40)	202 (202)	0 (0)
					95(95)		21(21)				
Lichens	Approx. 1,600 (Approx. 1,600)	4 (4)	0 (0)	63(61)			41 (41)	46 (46)	154 (152)	0 (0)	
				43(41)		20(20)					
Fungi	Approx. 3,000 (Approx. 3,000)	25 (26)	1 (1)	61(62)			21 (21)	51 (50)	159 (160)	0 (0)	
				37(39)		24(23)					
<b>Subtotal of Flora</b>		61 (62)	13 (13)	<b>2270(2266)</b>			421 (421)	195 (194)	2961 (2956)	0 (0)	
				1361(1358)		909(908)					
<b>Total of thirteen taxonomic groups</b>		110 (110)	14 (14)	<b>3716(3676)</b>			1364 (1371)	544 (544)	5748 (5715)	63 (60)	
				2110(2080)		1606(1596)					

\* 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 2019. 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:

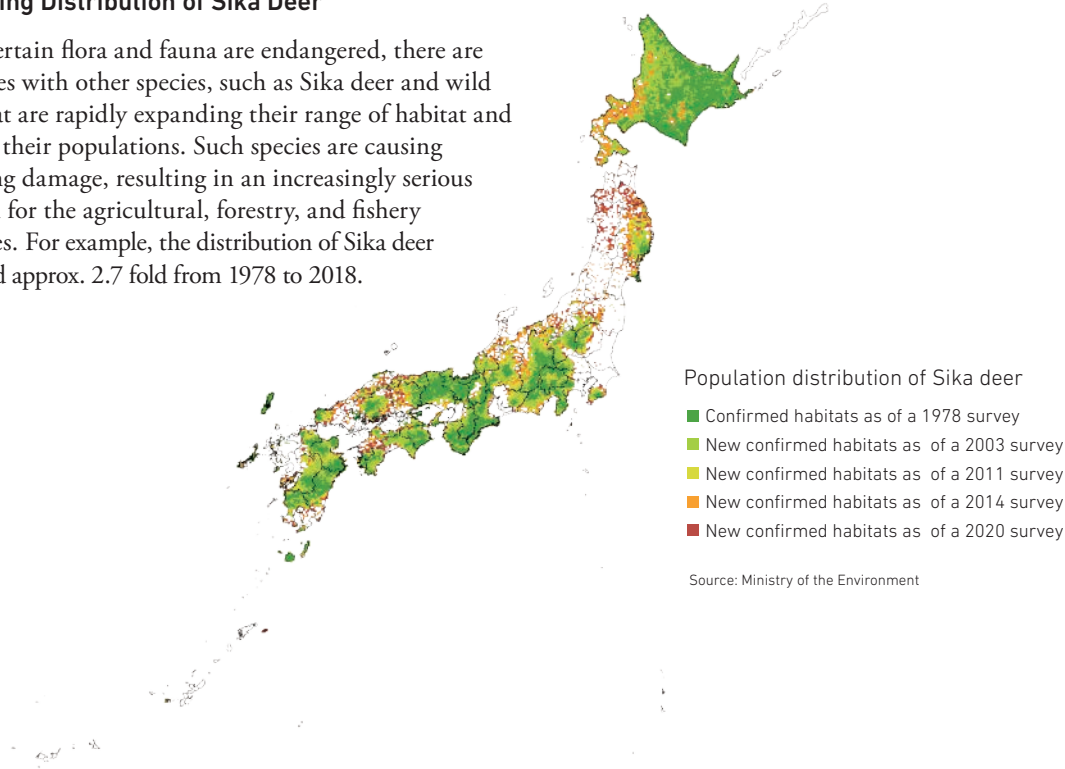
Extinct [EX]: Species that are likely to already be extinct / Extinct in the Wild [EW]: Species that exist only in captivity or as a naturalized population outside its natural habitat / Endangered Class I (Critically Endangered + Endangered) [CR+EN]: Species that are threatened to extinction / Endangered Class I A (Critically Endangered) [CR]: Species that are facing an extremely high risk of extinction in the wild in the near future / Endangered Class I B (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 and 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

# Biodiversity

Additional materials provide more details about biodiversity in Japan.

## Expanding Distribution 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 distribution of Sika deer expanded approx. 2.7 fold from 1978 to 2018.



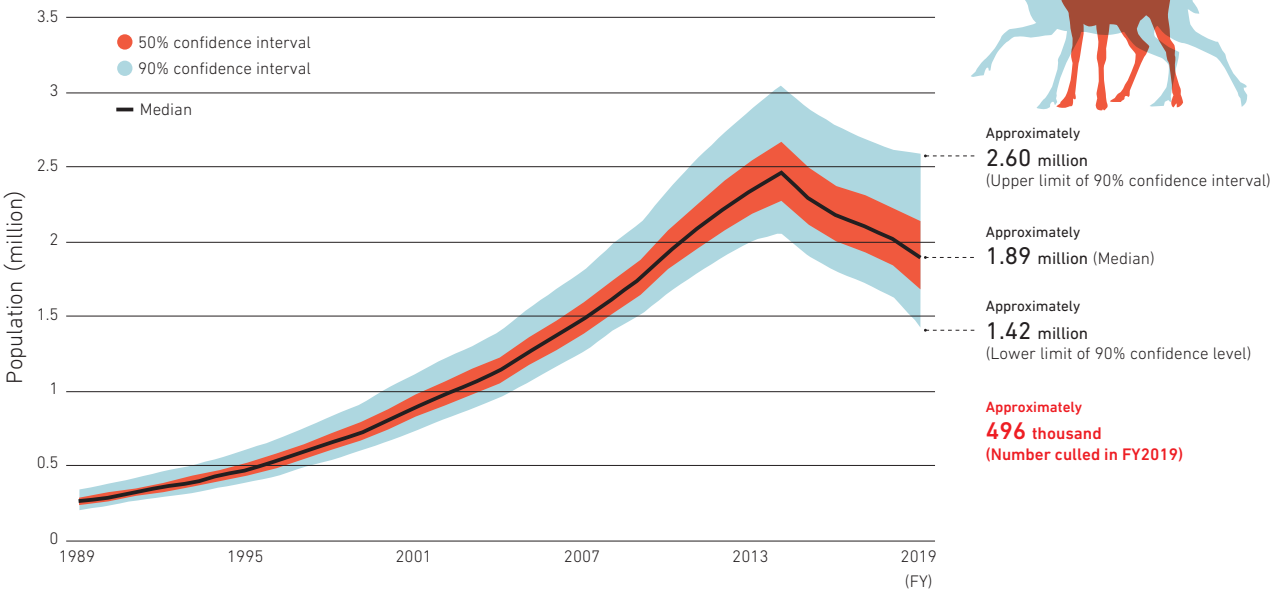
Population distribution of Sika deer

- Confirmed habitats as of a 1978 survey
- New confirmed habitats as of a 2003 survey
- New confirmed habitats as of a 2011 survey
- New confirmed habitats as of a 2014 survey
- New confirmed habitats as of a 2020 survey

Source: Ministry of the Environment

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

By implementation of various approaches, the number of capturing of sika deer increases, and the estimated number of individuals tends to decrease.



\*: In FY 2019, estimated number in Hokkaido was approx. 670,000, and number culled was approx. 107,000 (Hokkaido data).

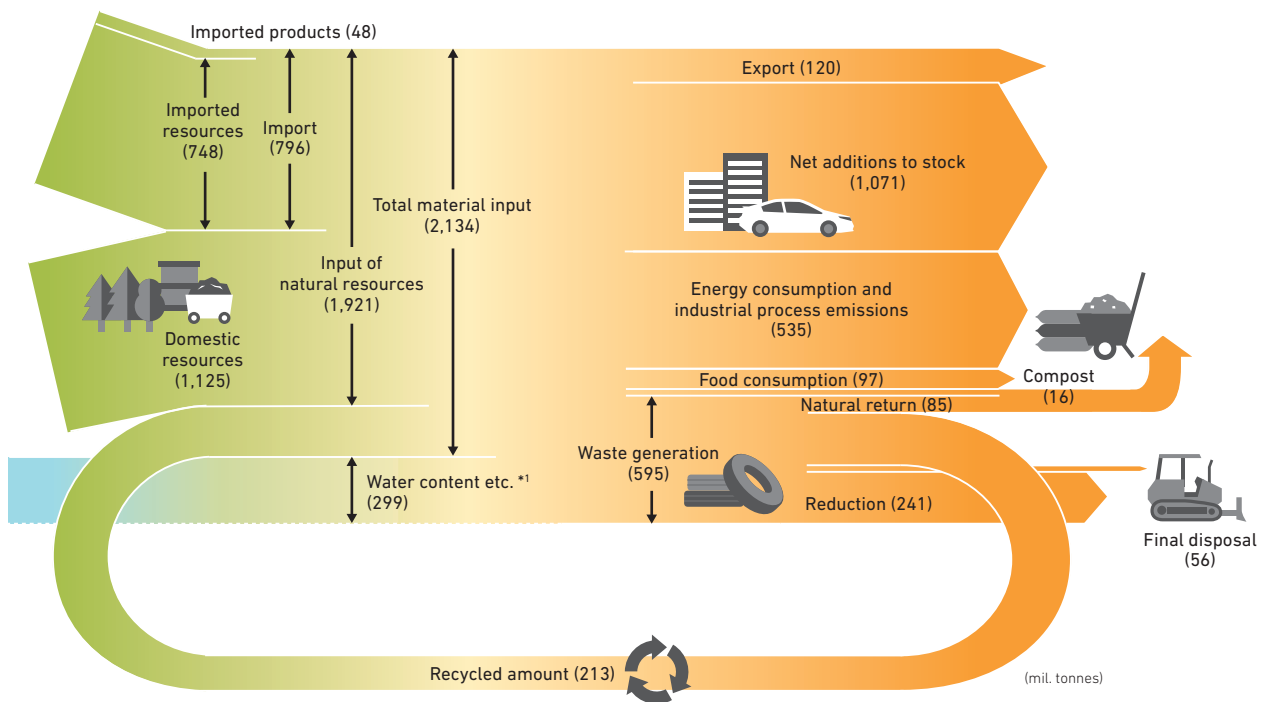
Source: Ministry of the Environment

# ADDITIONAL MATERIALS FROM THE 2021 ANNUAL REPORT ON THE ENVIRONMENT

## Material Flow in Japan

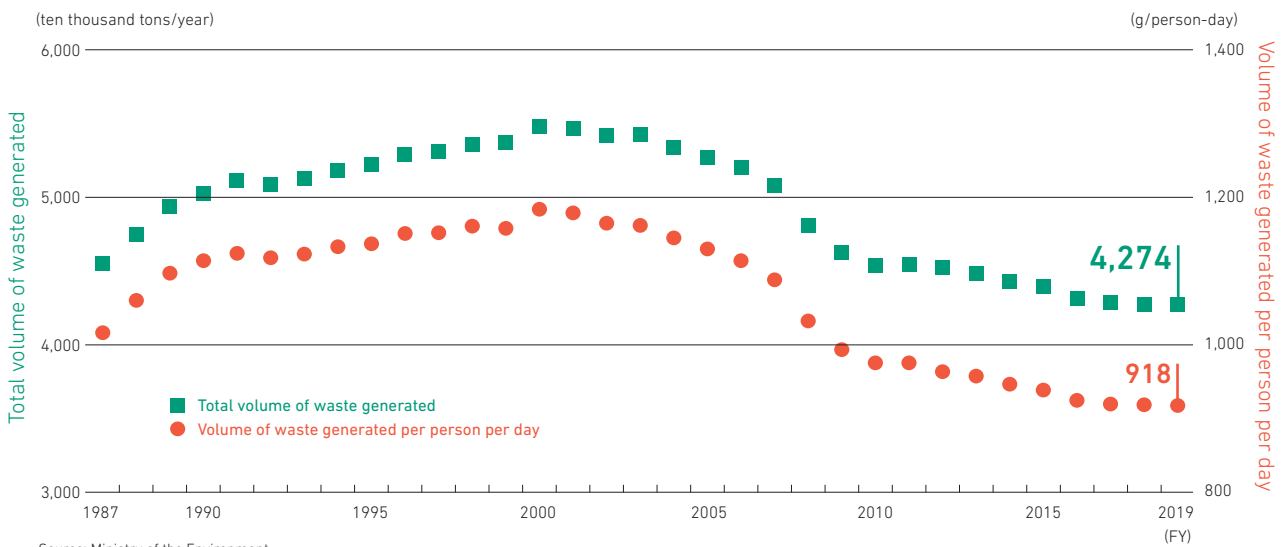
In order to establish a sound material-cycle society, it is necessary to comprehend material flows (or substance flows) to understand the extent of material extraction, consumption, and disposal in Japan. Japan uses material flows to determine targets for the four indicators of resource productivity,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

**FY2000** (for reference)



## 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.

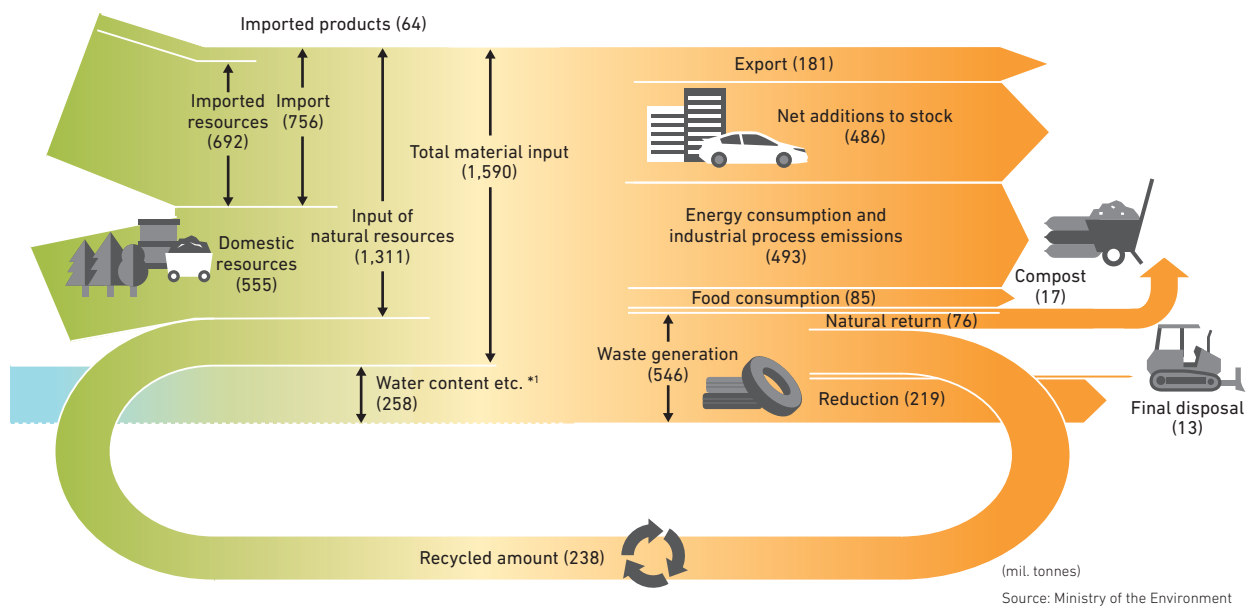


# Sound material-cycle society

Additional materials provide more information about current efforts to form a sound material-cycle society.

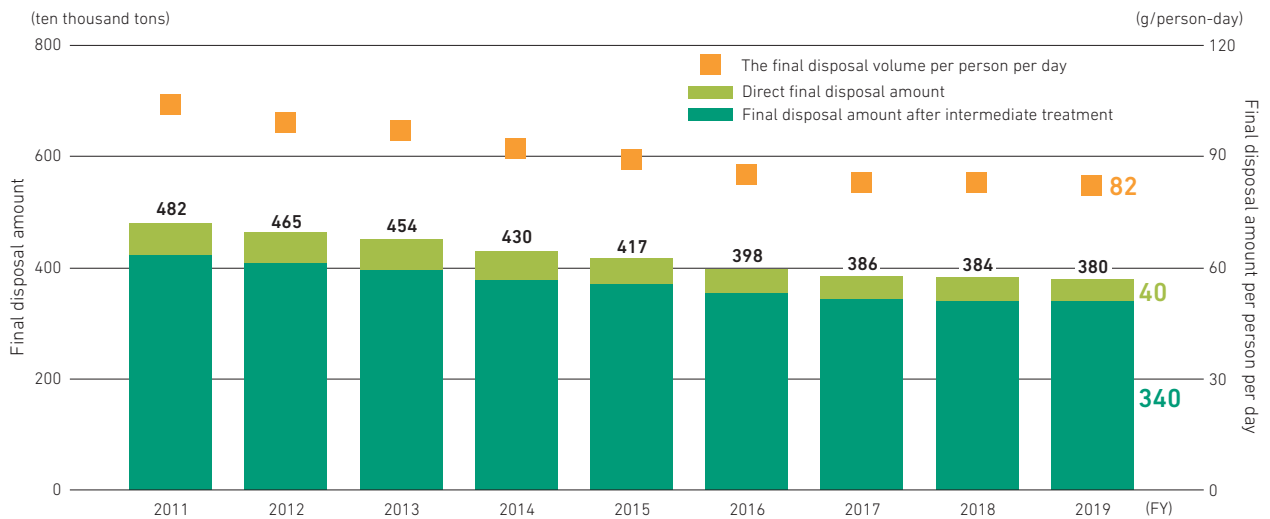
\*1 Water content: water contents of wastes (sludge, livestock waste, night soil, waste acid, waste alkali) and sediments dumped in association with the process of economic activities (sludge in mining, construction and in waterworks as well as slag)

## FY2018



## 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.



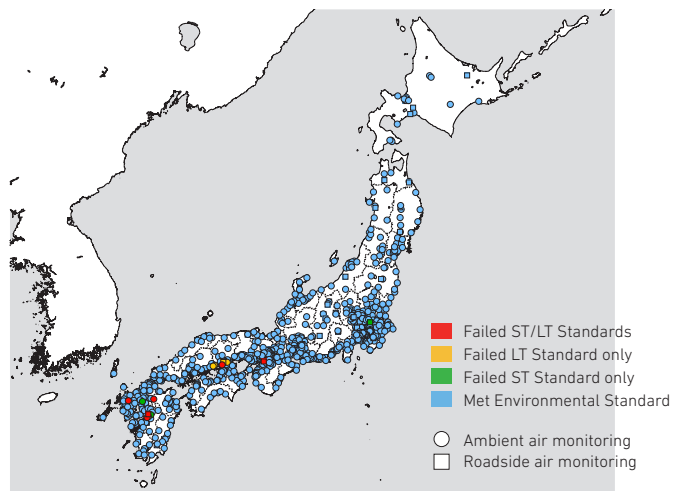
# ADDITIONAL MATERIALS FROM THE 2021 ANNUAL REPORT ON THE ENVIRONMENT

## Fine particulate matter

In FY2019, the rate of compliance with ambient air quality standards for fine particulate matter (PM 2.5) was 98.7% for ambient air pollution monitoring stations and 98.3% for roadside air pollution monitoring stations throughout Japan. The annual average was 9.8  $\mu\text{g}/\text{m}^3$  for ambient air pollution monitoring stations and 10.4  $\mu\text{g}/\text{m}^3$  for roadside air pollution monitoring stations. By region, the rate of compliance with environmental standards remains lower in mainly urban areas of the Kanto and Kansai regions, in parts of the Chugoku and Shikoku regions that face the Inland Sea, and in Kyushu.

Fiscal year	2014	2015	2016	2017	2018	2019
No. of vaild stations						
Ambient	672	765	785	814	818	835
Roadside	198	219	223	224	232	238
No. of vaild stations compliant with ambient air quality standards						
Ambient	254	570	696	732	765	824
	37.8%	74.5%	88.7%	89.9%	93.5%	98.7%
Roadside	51	128	197	193	216	234
	25.8%	58.4%	88.3%	86.2%	93.1%	98.3%

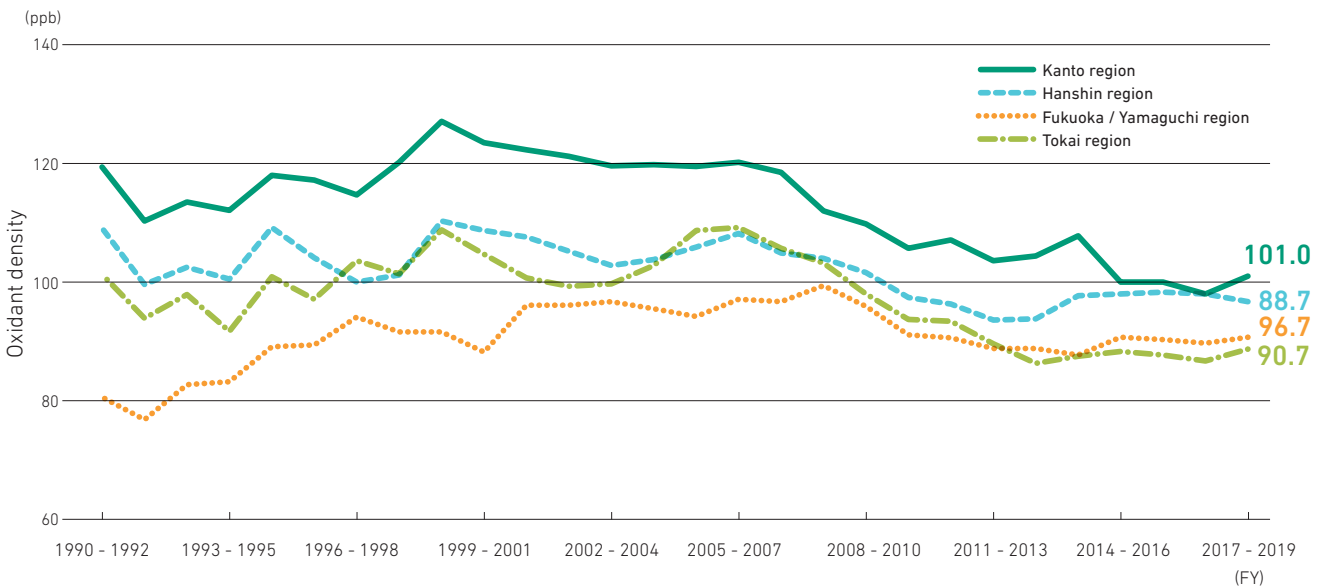
Source: Ministry of the Environment



Source: Ministry of the Environment

## Photochemical oxidants

Photochemical oxidant densities (the highest value within a region of the 3-year average of the 99th percentile values of highest 8-hour daily values) had been tending to decline since around FY2006 to FY2008, but in recent years they have tended to be almost flat.



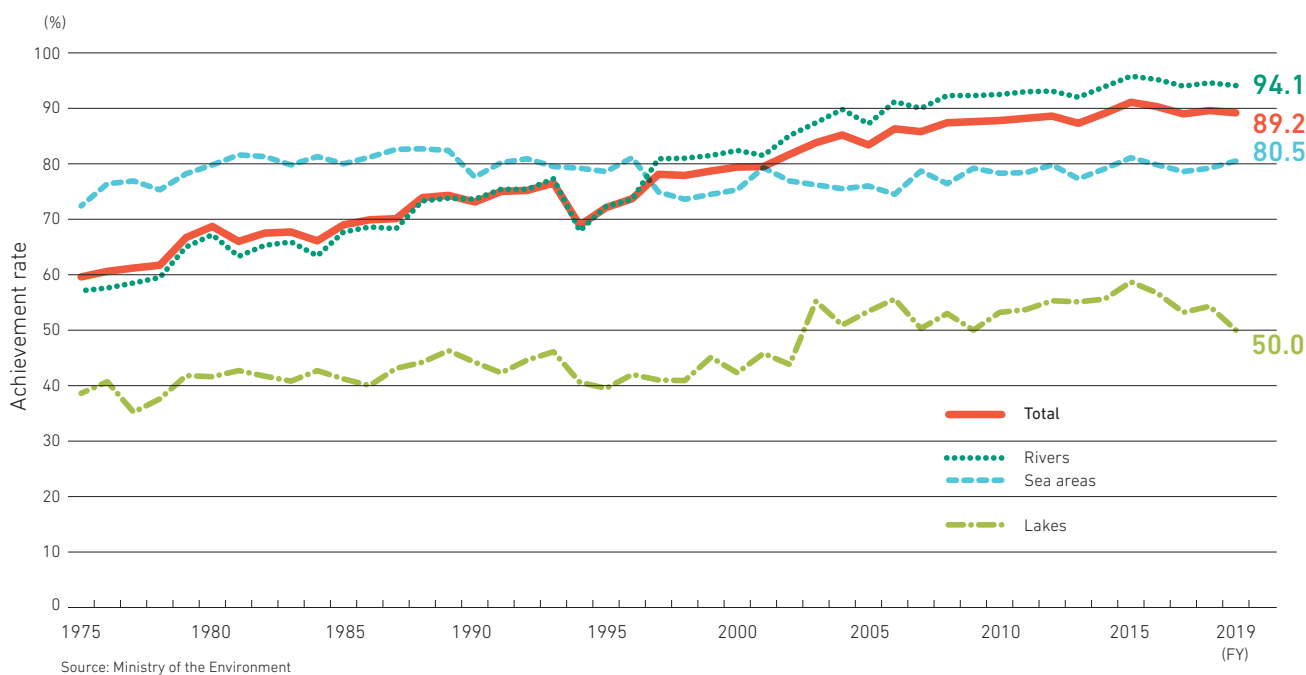
Source: Ministry of the Environment

# Atmospheric and water environments

Additional materials provide more information about atmospheric and water environments.

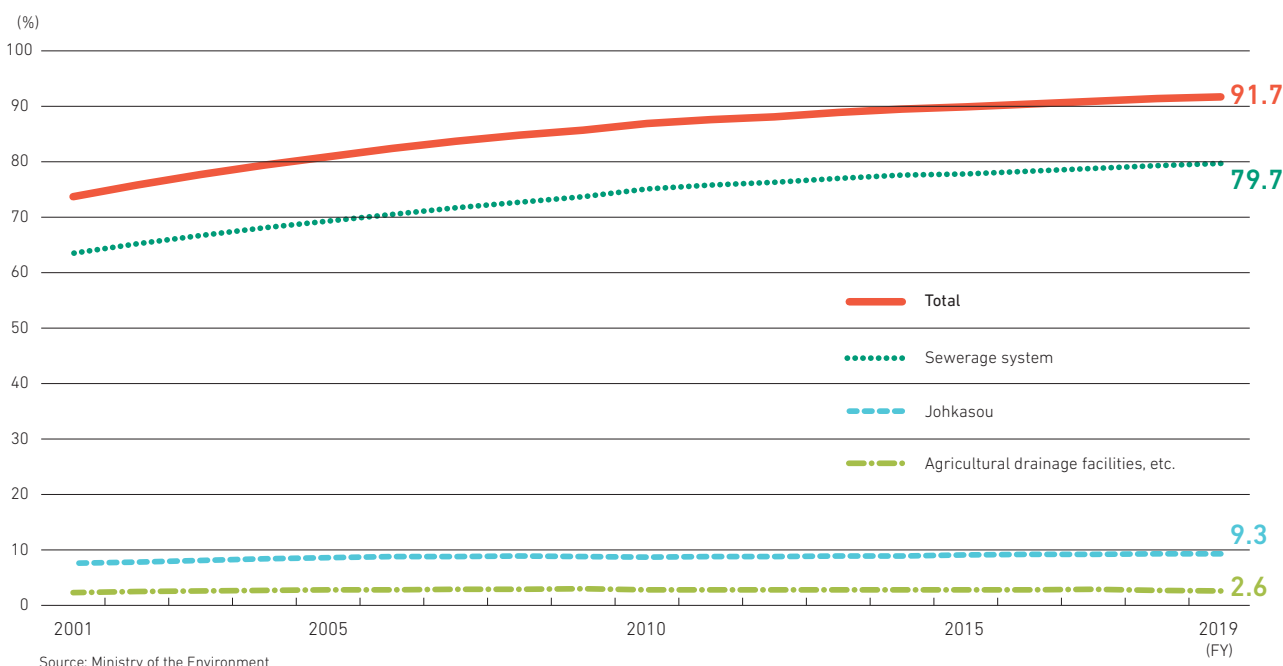
## Achievement of Environmental Standards (BOD or COD)

An overall level of 89.2% 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.



## Coverage of Population Served by Wastewater Treatment System

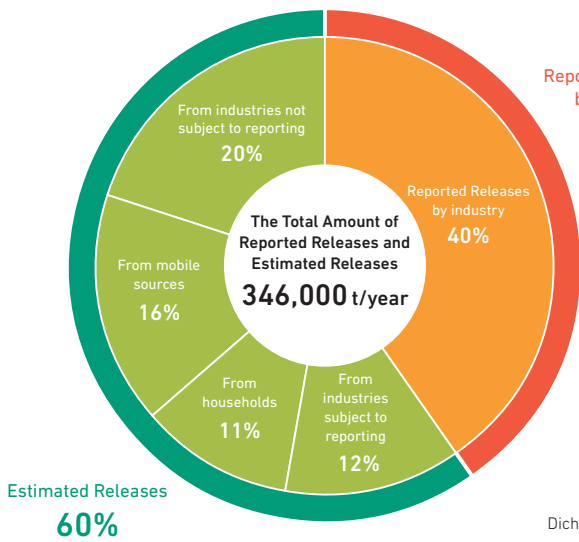
The population coverage of wastewater treatment systems in Japan is 91.7%. Wastewater treatment facilities are being installed to cover the population not yet served by the wastewater treatment systems.





# ADDITIONAL MATERIALS FROM THE 2021 ANNUAL REPORT ON THE ENVIRONMENT

## Breakdown of Reported Releases by Industry and Estimated Releases of Chemical Substances in FY 2019

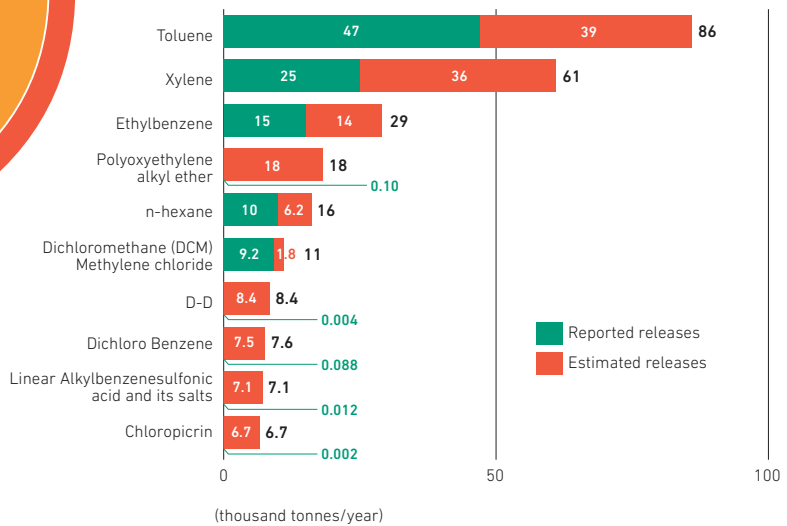


Notes: The reported releases are from the business entities categorized as subjected to reporting. Releases are estimated for businesses that do not meet the reporting requirements, such as number of employees, annual handling quantity, etc., and are exempted from reporting.

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

Reported Releases by industry  
40%

### Top 10 Chemicals with High-volume of Reported Releases and Estimated Releases (FY 2019)



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

In March 2021, 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.



## Sanriku Fukko (Reconstruction) National Park

The Sanriku Fukko (Reconstruction) National Park was created in May 2013 to contribute to the reconstruction of the Sanriku coastal region that was devastated by the Great East Japan Earthquake of March 11, 2011. The park extends approximately 250 km in the north-south direction. Its northern portion is known as “Alps by the Sea” because of its dynamic cliffs, while the southern portion is topographically characterized by an elegant ria coastline formed by numerous capes and bays.

The coast is home to a diverse collection of maritime plants that have adapted to the unique environment; moreover, visitors can observe wildlife up-close. In the shallow waters, eelgrass beds and seaweed beds have formed, supporting the area’s biological diversity. The cover photo shows the precipitous cliffs of Kitayamazaki area in Tanohata Village, Iwate Prefecture, a leading dynamic scenic spot of the park. The dense fog is a result of Yamase, the cool and humid easterly wind typical of Tohoku Region in summer.

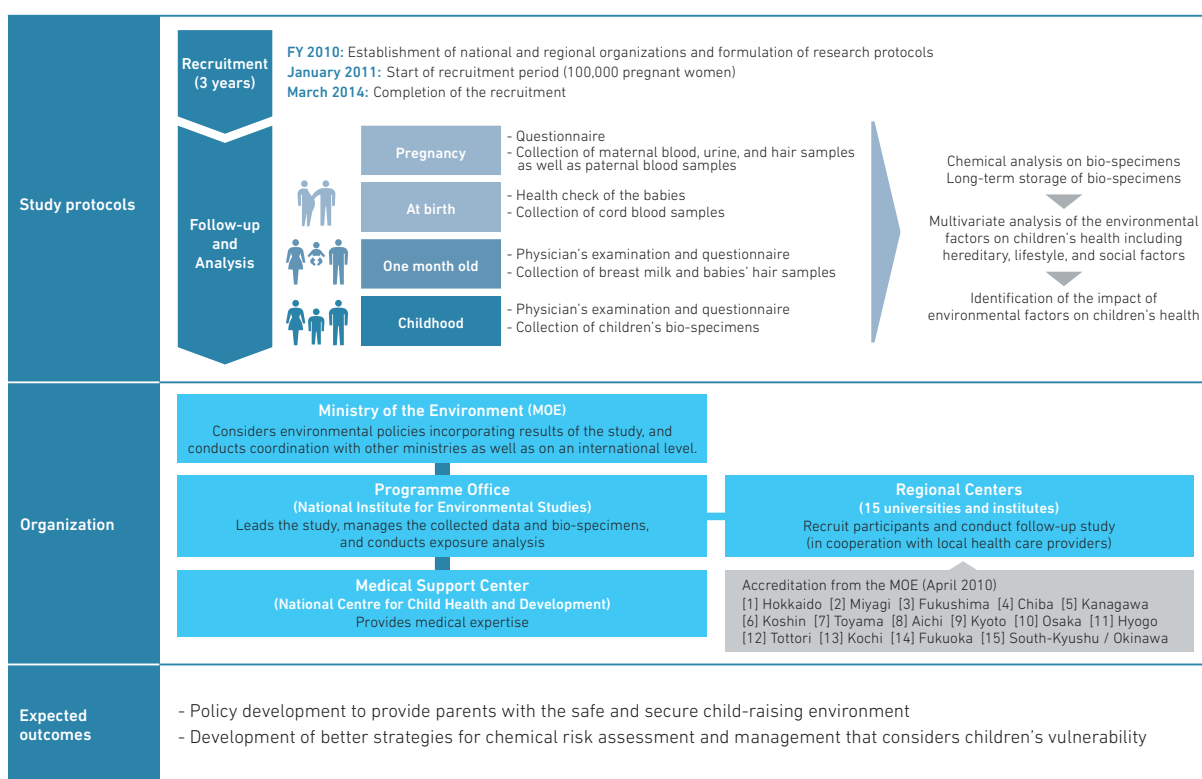
# Environmental risks of chemicals

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 2014, 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



Black-tailed gull

## Annual Report on the Environment, the Sound Material-Cycle Society and Biodiversity in Japan 2021

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