

2.01 Trends in emission amounts of greenhouse gasses in Japan

(Unit: million t-CO2)

	Carbon dioxide (CO2)	Methane (CH4)	Nitrous oxide (N2O)	Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Sulfur hexafluoride (SF6)	Nitrogen trifluoride (NF3)	Total
GWP	1	25	298	HFC-134a : 1,430 and the like	PFC-14 : 7,390 and the like	22,800	17,200	
1990	1,162	44	32	16	7	13	0.03	1,274
1991	1,171	43	31	17	8	14	0.03	1,284
1992	1,181	44	31	18	8	16	0.03	1,297
1993	1,174	40	31	18	11	16	0.04	1,289
1994	1,235	43	33	21	13	15	0.08	1,360
1995	1,248	42	33	25	18	16	0.20	1,382
1996	1,261	40	34	25	18	17	0.19	1,396
1997	1,259	40	35	24	20	15	0.17	1,393
1998	1,224	38	33	24	17	13	0.19	1,348
1999	1,259	38	27	24	13	9	0.32	1,370
2000	1,280	38	30	23	12	7	0.29	1,389
2001	1,263	37	26	19	10	6	0.29	1,361
2002	1,299	36	25	16	9	6	0.37	1,392
2003	1,304	34	25	16	9	5	0.42	1,395
2004	1,303	35	25	12	9	5	0.49	1,391
2005	1,311	35	25	13	9	5	1.47	1,399
2006	1,290	35	25	15	9	5	1.40	1,380
2007	1,325	35	24	17	8	5	1.59	1,415
2008	1,240	35	23	19	6	4	1.48	1,329
2009	1,167	34	23	21	4	2	1.35	1,252
2010	1,217	35	22	23	4	2	1.54	1,306
2011	1,266	34	22	26	4	2	1.80	1,356
2012	1,300	33	21	29	3	2	1.51	1,391
2013	1,316	33	21	32	3	2	1.62	1,409
2014	1,269	32	21	36	3	2	1.12	1,364
2015	1,227	31	21	39	3	2	0.57	1,325

Note:

•GWP: Global Warming Potential: a coefficient to indicate the extent that a GHG in question brings a greenhouse gas effect. It is expressed by a ratio of the effect caused by the GHG to that caused by CO2. The values are from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007).

•Non-energy related CO2 emissions include Indirect CO2 emission

Source: "National Greenhouse Gas Inventory Report of JAPAN," Ministry of the Environment

2.02 Trends in Carbon Dioxide Emissions by Sectors in Japan

CO2 emissions from energy sources

(Unit: million t-CO2, % increase/decrease compared with 1990)

	Total ①		Industry		Transport		Commercial and other		Households		Energy conversion	
1990	1,066.8		501.9		206.2		137.0		130.6		91.1	
1991	1,074.0	0.7%	491.0	-2.2%	218.7	6.0%	140.4	2.5%	132.5	1.5%	91.5	0.4%
1992	1,082.5	1.5%	480.7	-4.2%	225.1	9.2%	145.0	5.9%	139.8	7.0%	91.8	0.8%
1993	1,077.8	1.0%	466.8	-7.0%	228.4	10.7%	151.3	10.4%	141.0	7.9%	90.4	-0.8%
1994	1,134.2	6.3%	483.7	-3.6%	238.0	15.4%	166.6	21.6%	148.4	13.6%	97.6	7.1%
1995	1,146.7	7.5%	477.8	-4.8%	246.5	19.5%	170.2	24.3%	151.8	16.3%	100.3	10.0%
1996	1,158.4	8.6%	482.1	-3.9%	252.8	22.6%	175.2	27.8%	151.4	15.9%	97.0	6.4%
1997	1,157.2	8.5%	473.4	-5.7%	253.9	23.1%	180.5	31.8%	147.8	13.1%	101.6	11.5%
1998	1,128.1	5.7%	443.2	-11.7%	251.9	22.1%	193.4	41.2%	147.8	13.2%	91.7	0.7%
1999	1,162.8	9.0%	454.7	-9.4%	256.0	24.1%	203.4	48.5%	156.3	19.6%	92.4	1.4%
2000	1,182.1	10.8%	465.9	-7.2%	254.8	23.6%	210.3	53.5%	161.3	23.5%	89.8	-1.4%
2001	1,167.0	9.4%	453.3	-9.7%	258.9	25.5%	210.0	53.3%	157.6	20.6%	87.2	-4.2%
2002	1,206.5	13.1%	467.8	-6.8%	255.1	23.7%	221.4	61.6%	169.0	29.4%	93.3	2.4%
2003	1,211.6	13.6%	470.8	-6.2%	251.3	21.8%	225.7	64.8%	171.0	31.0%	92.7	1.8%
2004	1,211.6	13.6%	468.2	-6.7%	245.2	18.9%	238.8	74.3%	170.1	30.2%	89.2	-2.0%
2005	1,219.0	14.3%	456.9	-9.0%	239.7	16.2%	238.9	74.4%	179.9	37.7%	103.7	13.8%
2006	1,199.9	12.5%	471.8	-6.0%	236.1	14.5%	235.7	72.0%	168.3	28.8%	88.0	-3.4%
2007	1,234.6	15.7%	472.0	-6.0%	234.0	13.5%	237.3	73.2%	183.7	40.7%	107.6	18.1%
2008	1,153.2	8.1%	417.0	-16.9%	225.3	9.2%	231.5	69.0%	173.7	33.0%	105.8	16.1%
2009	1,090.0	2.2%	382.1	-23.9%	221.4	7.4%	219.9	60.5%	163.4	25.1%	103.2	13.3%
2010	1,138.8	6.7%	413.5	-17.6%	222.1	7.7%	218.8	59.7%	174.1	33.3%	110.2	21.0%
2011	1,188.4	11.4%	429.0	-14.5%	220.5	6.9%	235.9	72.2%	191.8	46.8%	111.3	22.1%
2012	1,220.7	14.4%	432.2	-13.9%	226.1	9.6%	253.6	85.1%	204.2	56.3%	104.6	14.8%
2013	1,235.0	15.8%	431.9	-14.0%	224.7	8.9%	278.3	103.1%	201.3	54.2%	98.9	8.5%
2014	1,189.4	11.5%	424.1	-15.5%	217.1	5.3%	274.0	100.0%	189.1	44.8%	85.0	-6.7%
2015	1,149.0	7.7%	411.2	-18.1%	213.3	3.4%	265.4	93.7%	179.5	37.4%	79.5	-12.7%

CO2 emissions from non-energy sources

	Total ②		Industrial processes		Agriculture		Waste		Leakage from fuel		total ((①+②))	
1990	95.6		65.1		0.6		24.0		5.9		1,162.5	
1991	96.7	1.1%	66.2	1.7%	0.5	-10.0%	24.2	0.8%	5.7	-2.5%	1,170.7	0.7%
1992	98.2	2.7%	66.1	1.6%	0.5	-19.0%	26.0	8.3%	5.5	-5.9%	1,180.6	1.6%
1993	95.7	0.1%	64.9	-0.4%	0.5	-14.0%	25.0	4.2%	5.3	-10.2%	1,173.5	1.0%
1994	100.6	5.2%	66.4	2.0%	0.3	-43.7%	28.6	19.1%	5.3	-10.6%	1,234.8	6.2%
1995	101.7	6.4%	66.8	2.5%	0.4	-41.0%	29.1	21.4%	5.4	-7.6%	1,248.4	7.4%
1996	102.9	7.6%	67.3	3.3%	0.3	-42.6%	29.6	23.5%	5.6	-5.6%	1,261.2	8.5%
1997	101.8	6.4%	64.7	-0.7%	0.4	-39.0%	31.2	30.0%	5.5	-6.6%	1,258.9	8.3%
1998	95.5	-0.1%	58.6	-10.0%	0.4	-38.1%	31.4	31.0%	5.1	-13.9%	1,223.6	5.3%
1999	95.7	0.1%	58.9	-9.6%	0.4	-39.2%	31.4	30.7%	5.1	-13.4%	1,258.6	8.3%
2000	97.7	2.2%	59.4	-8.9%	0.4	-27.3%	32.9	36.9%	5.1	-13.5%	1,279.8	10.1%
2001	95.6	0.0%	58.0	-10.9%	0.4	-39.6%	32.5	35.5%	4.7	-19.9%	1,262.6	8.6%
2002	93.0	-2.8%	55.3	-15.0%	0.4	-33.0%	32.8	36.5%	4.4	-24.7%	1,299.5	11.8%
2003	92.7	-3.0%	54.6	-16.2%	0.4	-29.3%	33.5	39.6%	4.2	-27.9%	1,304.4	12.2%
2004	91.8	-4.0%	54.5	-16.2%	0.4	-33.9%	32.7	36.2%	4.1	-29.9%	1,303.4	12.1%
2005	91.8	-4.0%	55.6	-14.6%	0.4	-32.6%	31.7	31.9%	4.1	-31.1%	1,310.8	12.8%
2006	90.2	-5.7%	55.9	-14.2%	0.4	-37.0%	29.9	24.6%	4.0	-31.7%	1,290.1	11.0%
2007	90.0	-5.9%	55.1	-15.4%	0.5	-17.9%	30.5	27.0%	3.9	-33.3%	1,324.6	13.9%
2008	86.7	-9.4%	50.8	-22.0%	0.4	-27.7%	31.9	32.7%	3.6	-39.4%	1,239.9	6.7%
2009	77.1	-19.4%	45.2	-30.5%	0.4	-35.9%	28.2	17.5%	3.3	-44.3%	1,167.1	0.4%
2010	78.6	-17.8%	46.3	-28.9%	0.4	-33.8%	28.7	19.6%	3.2	-46.3%	1,217.4	4.7%
2011	77.7	-18.7%	46.2	-29.0%	0.4	-31.9%	28.0	16.8%	3.0	-48.4%	1,266.1	8.9%
2012	79.6	-16.8%	46.3	-28.9%	0.5	-14.6%	29.8	24.3%	2.9	-50.0%	1,300.3	11.9%
2013	80.8	-15.5%	48.0	-26.2%	0.6	-5.1%	29.3	22.2%	2.9	-50.9%	1,315.9	13.2%
2014	79.3	-17.0%	47.4	-27.2%	0.6	-8.2%	28.5	18.8%	2.8	-52.2%	1,268.7	9.1%
2015	78.4	-18.0%	46.2	-29.1%	0.6	-8.2%	28.9	20.3%	2.9	-51.5%	1,227.4	5.6%

Note:

The emissions from energy sources by sector are the amount that CO2 emissions caused by power and heat generation are allocated to each of the final consumption sectors.

Source: "National Greenhouse Gas Inventory Report of JAPAN, " Ministry of the Environment

2.03 Trend in Major Socioeconomic Activities and Carbon Dioxide emissions (1)

	FY1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total CO ₂ emissions (M Mt-CO ₂)	1,162.5	1,248.4	1,261.2	1,258.9	1,223.6	1,258.6	1,279.8	1,262.6	1,299.5	1,304.4	1,303.4	1,310.8
(vs. the previous year)		1.1%	1.0%	-0.2%	-2.8%	2.9%	1.7%	-1.3%	2.9%	0.4%	-0.1%	0.6%
(vs. 1990)		7.4%	8.5%	8.3%	5.3%	8.3%	10.1%	8.6%	11.8%	12.2%	12.1%	12.8%
Emissions from energy sources	1,066.8	1,146.7	1,158.4	1,157.2	1,128.1	1,162.8	1,182.1	1,167.0	1,206.5	1,211.6	1,211.6	1,219.0
(vs. the previous year)		1.1%	1.0%	-0.1%	-2.5%	3.1%	1.7%	-1.3%	3.4%	0.4%	0.0%	0.6%
(vs. 1990)		7.5%	8.6%	8.5%	5.7%	9.0%	10.8%	9.4%	13.1%	13.6%	13.6%	14.3%
Emissions from non-energy sources	95.6	101.7	102.9	101.8	95.5	95.7	97.7	95.6	93.0	92.7	91.8	91.8
(vs. the previous year)		1.1%	1.1%	-1.1%	-6.2%	0.2%	2.1%	-2.2%	-2.8%	-0.2%	-1.1%	0.0%
(vs. 1990)		6.4%	7.6%	6.4%	-0.1%	0.1%	2.2%	0.0%	-2.8%	-3.0%	-4.0%	-4.0%
Electric energy generation of electric companies (in MM kWh)	757,593	868,027	884,574	904,935	909,150	921,062	940,687	921,997	935,807	920,134	946,756	969,135
(vs. the previous year)		2.2%	1.9%	2.3%	0.5%	1.3%	2.1%	-2.0%	1.5%	-1.7%	2.9%	2.4%
(vs. 1990)		14.6%	16.8%	19.4%	20.0%	21.6%	24.2%	21.7%	23.5%	21.5%	25.0%	27.9%
Components of power supply by source	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Thermal power	61.5%	56.5%	56.2%	54.1%	52.7%	55.8%	56.0%	55.6%	59.2%	63.1%	59.7%	60.0%
Hydro power	11.7%	9.7%	9.4%	10.3%	10.5%	9.6%	9.5%	9.4%	9.0%	10.4%	10.1%	8.2%
Nuclear power	26.6%	33.4%	34.0%	35.2%	36.4%	34.3%	34.2%	34.7%	31.4%	26.1%	29.8%	31.4%
New energy	0.2%	0.3%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%
Industrial Production Index (IPI : in 2005 = 100)	107.4	101.7	105.1	106.3	99.0	101.6	106.0	96.3	99.0	102.0	105.9	107.6
(vs. the previous year)		2.1	3.4	1.2	-7.3	2.6	4.3	-9.7	2.8	2.9	3.9	1.7
Crude steel production (in 1,000 t)	111,710	100,023	100,793	102,800	90,979	97,999	106,901	102,064	109,786	110,998	112,897	112,718
(vs. the previous year)		-1.3%	0.8%	2.0%	-11.5%	7.7%	9.1%	-4.5%	7.6%	1.1%	1.7%	-0.2%
(vs. 1990)		-10.5%	-9.8%	-8.0%	-18.6%	-12.3%	-4.3%	-8.6%	-1.7%	-0.6%	1.1%	0.9%
Ethylene production (in 1,000 t)	5,810	6,944	7,138	7,338	7,223	7,721	7,566	7,206	7,283	7,419	7,555	7,549
(vs. the previous year)		13.4%	2.8%	2.8%	-1.6%	6.9%	-2.0%	-4.8%	1.1%	1.9%	1.8%	-0.1%
(vs. 1990)		19.5%	22.9%	26.3%	24.3%	32.9%	30.2%	24.0%	25.4%	27.7%	30.0%	130593.9%
Cement production (in 1,000 t)	86,893	91,645	94,363	89,446	80,794	80,494	80,068	75,722	70,819	68,253	67,046	70,127
(vs. the previous year)		0.0%	3.0%	-5.2%	-9.7%	-0.4%	-0.5%	-5.4%	-6.5%	-3.6%	-1.8%	4.6%
(vs. 1990)		5.5%	8.6%	2.9%	-7.0%	-7.4%	-7.9%	-12.9%	-18.5%	-21.5%	-22.8%	-19.3%
Paper, paperboard and pulp production (in 1,000 t)	39,227	40,637	41,068	42,414	40,507	42,086	43,008	40,942	41,415	41,149	41,550	41,832
(vs. the previous year)		4.3%	1.1%	3.3%	-4.5%	3.9%	2.2%	-4.8%	1.2%	-0.6%	1.0%	0.7%
(vs. 1990)		3.6%	4.7%	8.1%	3.3%	7.3%	9.6%	4.4%	5.6%	4.9%	5.9%	6.6%
Number of households (in 1,000)	41,156	44,236	44,831	45,498	46,157	46,812	47,420	48,015	48,638	49,261	49,838	50,382
(vs. the previous year)		1.3%	1.3%	1.5%	1.4%	1.4%	1.3%	1.3%	1.3%	1.3%	1.2%	1.1%
(vs. 1990)		7.5%	8.9%	10.5%	12.1%	13.7%	15.2%	16.7%	18.2%	19.7%	21.1%	22.4%
Commercial sector's floor area (in M m ²)	1,285	1,498	1,530	1,564	1,601	1,631	1,656	1,686	1,702	1,722	1,739	1,759
(vs. the previous year)		3.0%	2.1%	2.2%	2.4%	1.9%	1.5%	1.8%	0.9%	1.2%	1.0%	1.2%
(vs. 1990)		16.6%	19.1%	21.7%	24.6%	26.9%	28.9%	31.2%	32.5%	34.0%	35.3%	36.9%
Transport volume in passenger sector (in M persons / km)	1,295,356	1,385,408	1,405,948	1,416,287	1,421,926	1,422,105	1,417,323	1,422,857	1,423,180	1,424,193	1,416,130	1,409,239
(vs. the previous year)		1.5%	1.5%	0.7%	0.4%	0.0%	-0.3%	0.4%	0.0%	0.1%	-0.6%	-0.5%
(vs. 1990)		7.0%	8.5%	9.3%	9.8%	9.8%	9.4%	9.8%	9.9%	9.9%	9.3%	8.8%
Private vehicles	727,049	806,336	823,552	839,254	852,031	854,762	851,893	856,140	857,330	855,827	849,692	833,455
Business vehicles	12,558	11,078	10,661	10,293	9,912	9,728	9,678	9,477	9,557	9,610	9,303	9,222
Bus	110,972	97,287	94,891	92,900	90,433	88,686	87,306	86,350	86,181	86,391	86,286	88,066
Railway	387,478	400,056	402,156	395,239	388,938	385,101	384,441	385,421	382,236	384,958	385,163	391,228
Navigation	6,274	5,637	5,634	5,351	4,620	4,479	4,304	4,006	3,893	4,024	3,869	4,025
Aviation	51,624	65,014	69,053	73,250	75,992	79,349	79,700	81,463	83,982	83,382	81,816	83,242
Transport volume in cargo sector (in M tons / km)	461,127	466,837	477,615	472,844	457,134	463,584	479,072	481,592	471,895	461,655	465,892	463,815
(vs. the previous year)		1.7%	2.3%	-1.0%	-3.3%	1.4%	3.3%	0.5%	-2.0%	-2.2%	0.9%	-0.4%
(vs. 1990)		1.2%	3.6%	2.5%	-0.9%	0.5%	3.9%	4.4%	2.3%	0.1%	1.0%	0.6%
Truck	188,586	202,482	209,929	210,226	206,250	210,572	214,190	213,954	213,190	219,643	223,525	228,351
Railway	27,196	25,101	24,968	24,618	22,920	22,541	22,136	22,193	22,131	22,794	22,476	22,813
Navigation	244,546	238,330	241,756	237,018	226,980	229,432	241,671	244,451	235,582	218,191	218,833	211,576
Aviation	799	924	963	981	985	1,039	1,075	994	991	1,027	1,059	1,076

2.03 Trend in Major Socioeconomic Activities and Carbon Dioxide emissions (2)

	2006	FY2007	2008	2009	2010	2011	2012	2013	2014	2015	Source
Total CO ₂ emissions (M Mt-CO ₂)	1,290.1	1,324.6	1,239.9	1,167.1	1,217.4	1,266.1	1,300.3	1,315.9	1,268.7	1,227.4	Greenhouse Gas emissions/removals listings
(vs. the previous year)	-1.6%	2.7%	-6.4%	-5.9%	4.3%	4.0%	2.7%	1.2%	-3.6%	-3.3%	
(vs. 1990)	11.0%	13.9%	6.7%	0.4%	4.7%	8.9%	11.9%	13.2%	9.1%	5.6%	
Emissions from energy sources	1,199.9	1,234.6	1,153.2	1,090.0	1,138.8	1,188.4	1,220.7	1,235.0	1,189.4	1,149.0	
(vs. the previous year)	-1.6%	2.9%	-6.6%	-5.5%	4.5%	4.4%	2.7%	1.2%	-3.7%	-3.4%	
(vs. 1990)	12.5%	15.7%	8.1%	2.2%	6.7%	11.4%	14.4%	15.8%	11.5%	7.7%	
Emissions from non-energy sources	90.2	90.0	86.7	77.1	78.6	77.7	79.6	80.8	79.3	78.4	The Electric Power Companies Handbook(Component ratio of electric power supply is based on electric-generating capacity.)
(vs. the previous year)	-1.7%	-0.2%	-3.7%	-11.0%	1.9%	-1.1%	2.4%	1.6%	-1.9%	-1.1%	
(vs. 1990)	-5.7%	-5.9%	-9.4%	-19.4%	-17.8%	-18.7%	-16.8%	-15.5%	-17.0%	-18.0%	
Electric energy generation of electric companies (in MM kWh)	972,883	1,004,622	957,889	925,392	918,239	857,405	821,955	823,668	790,561	762,551	
(vs. the previous year)	0.4%	3.3%	-4.7%	-3.4%	-0.8%	-6.6%	-4.1%	0.2%	-4.0%	-3.5%	
(vs. 1990)	28.4%	32.6%	26.4%	22.1%	21.2%	13.2%	8.5%	8.7%	4.4%	0.7%	
Components of power supply by source	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	The comprehensive list of Production Index(Indices of Industrial Production, Producer's Shipment and Producer's Inventory) —Base year 2005—
Thermal power	59.4%	65.8%	64.9%	61.4%	62.2%	80.1%	89.8%	90.2%	90.6%	88.6%	
Hydro power	9.1%	7.6%	7.9%	8.1%	8.3%	8.7%	8.2%	8.3%	8.8%	9.7%	
Nuclear power	31.2%	26.3%	26.9%	30.2%	29.3%	10.9%	1.8%	1.0%	0.0%	1.1%	
New energy	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.5%	0.5%	0.6%	
Industrial Production Index (IPI : in 2005 = 100)	112.5	115.6	101.0	91.3	99.4	98.8	95.8	99.0	98.4	97.4	Current Survey of Production, Ministry of Economy, Trade, and Industry (For 1990-2010, the Annual Report of Statistics for Metals, Non-metals, and Metal products. For 1990~2000, cf. The Annual Report of Statistics for steel)
(vs. the previous year)	4.9	3.1	-14.6	-9.7	8.1	-0.6	-3.0	3.2	-0.6	-1.0	
Crude steel production (in 1,000 t)	117,745	121,511	105,500	96,448	110,793	106,462	107,305	111,524	109,844	104,229	
(vs. the previous year)	4.5%	3.2%	-13.2%	-8.6%	14.9%	-3.9%	0.8%	3.9%	-1.5%	-5.1%	
(vs. 1990)	5.4%	8.8%	-5.6%	-13.7%	-0.8%	-4.7%	-3.9%	-0.2%	-1.7%	-6.7%	
Ethylene production (in 1,000 t)	7,661	7,559	6,520	7,219	6,999	6,474	6,261	6,764	6,687	6,780	Current Survey of Production, Ministry of Economy, Trade, and Industry (For 1990 - 2010, the Annual Report of Statistics for Chemical industries)
(vs. the previous year)	1.5%	-1.3%	-13.7%	10.7%	-3.0%	-7.5%	-3.3%	8.0%	-1.1%	1.4%	
(vs. 1990)	31.9%	30.1%	12.2%	24.3%	20.5%	11.4%	7.8%	16.4%	15.1%	16.7%	
Cement production (in 1,000 t)	70,145	66,477	61,295	53,195	50,901	52,641	55,072	58,827	56,882	54,242	
(vs. the previous year)	0.0%	-5.2%	-7.8%	-13.2%	-4.3%	3.4%	4.6%	6.8%	-3.3%	-4.6%	
(vs. 1990)	-19.3%	-23.5%	-29.5%	-38.8%	-41.4%	-39.4%	-36.6%	-32.3%	-34.5%	-37.6%	
Paper, paperboard and pulp production (in 1,000 t)	41,910	42,304	38,620	35,782	36,754	35,543	34,275	35,618	35,118	34,986	Current Survey of Production, Ministry of Economy, Trade, and Industry (For 1990-2001, the Annual Report for Paper, Pulp; For 2002-2003, the Annual Report for Paper, Pulp, Plastics, Rubber products, For 2004 - 2010, the Annual Report of Statistics for Paper, Printing, Plastics, Rubber products) For 1990-1996, the data are taken by the calendar year.
(vs. the previous year)	0.2%	0.9%	-8.7%	-7.4%	2.7%	-3.3%	-3.6%	3.9%	-1.4%	-0.4%	
(vs. 1990)	6.8%	7.8%	-1.5%	-8.8%	-6.3%	-9.4%	-12.6%	-9.2%	-10.5%	-10.8%	
Number of households (in 1,000)	51,102	51,713	52,325	52,878	53,363	53,783	54,171	54,595	54,952	55,364	
(vs. the previous year)	1.4%	1.2%	1.2%	1.1%	0.9%	0.8%	0.7%	0.8%	0.7%	0.8%	
(vs. 1990)	24.2%	25.6%	27.1%	28.5%	29.7%	30.7%	31.6%	32.7%	33.5%	34.5%	
Commercial sector's floor area (in M m ²)	1,776	1,791	1,812	1,821	1,830	1,827	1,838	1,850	1,859	1,869	The Energy Data and Modelling Center (EDMC, 2017)
(vs. the previous year)	1.0%	0.8%	1.2%	0.5%	0.5%	-0.2%	0.6%	0.7%	0.5%	0.5%	
(vs. 1990)	38.2%	39.4%	41.0%	41.7%	42.4%	42.2%	43.0%	44.0%	44.7%	45.4%	
Transport volume in passenger sector (in M persons / km)	1,401,124	1,410,596	1,392,870	1,368,794	1,347,201	1,336,914	1,377,576	1,379,556	1,375,033	1,382,774	
(vs. the previous year)	-0.6%	0.7%	-1.3%	-1.7%	-1.6%	-0.8%	3.0%	0.1%	-0.3%	0.6%	
(vs. 1990)	8.2%	8.9%	7.5%	5.7%	4.0%	3.2%	6.3%	6.5%	6.2%	6.7%	
Private vehicles	817,785	818,993	805,415	801,163	783,502	777,931	800,584	787,855	783,770	780,749	The Energy Data and Modelling Center (EDMC, 2017)
Business vehicles	9,198	8,913	8,489	8,155	7,796	7,292	7,210	7,044	6,930	6,508	
Bus	88,699	88,969	89,921	87,402	85,654	82,351	84,363	82,835	80,571	79,750	
Railway	395,908	405,544	404,585	393,765	393,466	395,067	404,396	414,387	413,970	427,486	
Navigation	3,783	3,834	3,510	3,073	3,004	3,047	3,092	3,265	2,986	N.A.	
Aviation	85,752	84,343	80,950	75,235	73,779	71,226	77,931	84,169	86,807	88,280	
Transport volume in cargo sector (in M tons / km)	468,498	469,200	447,518	417,214	449,151	431,482	410,925	422,861	417,026	409,044	The Energy Data and Modelling Center (EDMC, 2017)
(vs. the previous year)	1.0%	0.1%	-4.6%	-6.8%	7.7%	-3.9%	-4.8%	2.9%	-1.4%	-1.9%	
(vs. 1990)	1.6%	1.8%	-3.0%	-9.5%	-2.6%	-6.4%	-10.9%	-8.3%	-9.6%	-11.3%	
Trucks	239,363	241,758	236,324	228,293	247,821	235,590	211,644	215,830	211,753	206,025	
Railway	23,192	23,334	22,256	20,562	20,398	19,998	20,471	21,071	21,029	21,519	
Navigation	207,849	202,962	187,859	167,315	179,898	174,900	177,791	184,860	183,120	180,381	
Aviation	1,095	1,146	1,080	1,044	1,033	993	1,018	1,100	1,125	1,120	

Source: Ministry of the Environment

2.04 Trends in carbon dioxide emissions by energy use in major countries and regions (1)

CO₂ emissions in the world(Unit: million t-CO₂)

	1971	1973	1980	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012	2013	2014
North America	4,628	5,066	5,017	5,222	5,522	6,159	6,237	6,242	6,054	5,634	5,873	5,747	5,568	5,653	5,731
USA	4,288	4,690	4,595	4,802	5,073	5,643	5,702	5,686	5,512	5,120	5,347	5,211	5,031	5,103	5,176
Canada	340	376	422	420	449	516	535	556	543	514	526	536	537	550	555
Latin America	452	528	732	840	981	1,189	1,320	1,399	1,465	1,434	1,529	1,573	1,637	1,654	1,681
Mexico	93.7	118	205	257	291	360	411	432	432	423	438	455	458	448	431
Brazil	87.5	112	168	184	228	292	311	330	348	324	371	390	422	451	476
Chile	21.0	20.0	21.4	29.4	37.1	48.6	54.4	63.1	66.5	64.2	68.6	75.3	77.2	82.0	75.8
Peru	15.4	16.3	20.4	19.1	23.3	26.4	28.6	30.9	35.2	37.7	41.1	44.2	44.0	44.8	47.8
Europe	5,813	6,389	7,394	7,841	6,459	6,270	6,498	6,608	6,584	6,076	6,330	6,321	6,244	6,129	5,838
Europe OECD	3,625	3,929	4,101	3,901	3,824	3,893	4,028	4,018	3,943	3,672	3,793	3,649	3,639	3,560	3,392
UK	621	634	570	548	514	521	531	521	508	459	477	438	462	450	408
Germany	978	1,052	1,048	940	857	812	787	767	775	720	759	731	745	764	723
France	423	474	455	346	344	365	370	353	349	333	340	310	312	317	286
Italy	289	328	355	389	401	420	456	441	429	384	392	384	367	337	320
Europe non-OECD	2,188	2,460	3,293	3,940	2,635	2,377	2,471	2,590	2,641	2,404	2,537	2,672	2,605	2,569	2,446
Former Soviet Union	1,942	2,189	2,936	3,606	2,400	2,164	2,232	2,344	2,397	2,181	2,318	2,434	2,384	2,366	2,249
Russia	N.A.	N.A.	N.A.	2,163	1,548	1,474	1,482	1,533	1,554	1,440	1,529	1,604	1,551	1,535	1,468
Africa	249	285	398	529	576	658	857	909	967	956	996	1,002	1,056	1,072	1,105
South Africa	157	178	208	244	260	281	372	391	423	399	407	395	408	423	437
Middle East	96	124	303	536	744	880	1,148	1,281	1,366	1,433	1,490	1,540	1,609	1,654	1,728
Iran	39	52	88	171	244	312	418	480	487	504	498	508	512	535	556
Saudi Arabia	13	18	99	151	192	235	298	333	364	379	419	435	463	471	507
Asia	2,014	2,303	3,065	4,590	6,016	6,732	9,533	10,988	11,155	11,686	12,645	13,562	13,927	14,402	14,715
China	780	864	1,364	2,076	2,887	3,086	5,358	6,469	6,608	7,026	7,707	8,465	8,621	8,980	9,087
Japan	751	897	870	1,041	1,108	1,141	1,178	1,206	1,121	1,060	1,112	1,166	1,209	1,230	1,189
Hong Kong	9.2	9.6	14.6	33.3	36.5	40.3	41.3	44.0	42.9	46.2	42.0	45.6	45.1	46.1	47.9
Taiwan	29.8	38.1	71.4	111	154	214	254	264	253	240	256	255	247	248	250
South Korea	52.9	68.2	126	232	357	432	458	477	489	502	551	574	575	572	568
Singapore	6.06	8.12	12.65	28.96	37.57	42.12	37.86	39.42	39.35	40.33	44.28	46.74	45.96	46.24	45.32
Brunei	0.400	0.680	2.64	3.26	4.50	4.42	4.82	6.84	7.22	7.43	6.86	7.01	6.97	6.85	6.70
Indonesia	25.2	32.1	67.6	134	204	255	319	354	350	365	377	385	392	400	437
Malaysia	12.8	13.0	23.7	49.6	79.6	115	156	178	190	170	190	191	193	209	221
Philippines	23.0	27.3	33.3	38.0	57.2	68.1	71.5	69.0	71.2	71.5	77.1	77.7	80.4	89.6	95.7
Thailand	16.2	20.7	33.7	80.9	140	152	200	209	215	207	223	222	239	247	244
India	181	188	262	530	708	890	1,080	1,265	1,345	1,513	1,594	1,674	1,791	1,852	2,020
Vietnam	16.3	17.6	14.9	17.4	27.5	44.2	79.1	89.8	101	112	126	126	125	130	143
Oceania	157	174	223	281	309	364	406	420	423	426	420	417	418	414	405
Australia	143	158	207	260	285	335	372	387	390	396	390	387	387	383	374
New Zealand	13.5	16.7	16.5	21.7	23.9	29.0	33.7	32.6	33.5	30.5	30.4	29.7	31.2	31.0	31.2
OECD 34	9,342	10,288	10,582	10,996	11,494	12,452	12,830	12,923	12,593	11,846	12,323	12,150	12,018	12,027	11,856
Non-OECD	4,077	4,590	6,565	8,877	9,150	9,840	13,211	14,968	15,464	15,846	17,001	18,057	18,486	18,997	19,395
EU 28	N.A.	N.A.	N.A.	4,024	3,812	3,787	3,920	3,868	3,788	3,504	3,612	3,463	3,425	3,348	3,160
EU 15	N.A.	N.A.	N.A.	3,038	3,013	3,086	3,192	3,121	3,058	2,826	2,910	2,761	2,751	2,699	2,534
Euro zone 19	N.A.	N.A.	N.A.	2,549	2,485	2,553	2,662	2,605	2,559	2,370	2,438	2,333	2,303	2,264	2,139
APEC 20	N.A.	N.A.	N.A.	11,817	12,824	14,027	16,774	18,128	18,053	17,873	19,082	19,903	19,895	20,381	20,491
ASEAN 9	105	123	194	356	559	693	881	960	986	984	1,057	1,068	1,098	1,147	1,217
Bunker	523	579	559	630	718	853	997	1,099	1,108	1,057	1,126	1,147	1,089	1,105	1,130
World	13,942	15,458	17,706	20,503	21,362	23,144	27,038	28,990	29,165	28,749	30,450	31,354	31,593	32,129	32,381

Note:

For the figures in the shadowed columns, the values are calculated by summing CO₂ emissions of each country in the group, as the source data do not pertain the same group.Source: CO₂ Emissions from Fuel Combustion Highlights 2016

2.04 Trends in carbon dioxide emissions by energy use in major countries and regions (2)

CO₂ emissions per person in the world(Unit: t-CO₂ / person)

	1971	1973	1980	1990	1995	2000	2005	2007	2008	2009	2010	2011	2012	2013	2014
North America	20.2	21.6	19.9	18.8	18.7	19.7	19.0	18.7	17.9	16.5	17.1	16.6	15.9	16.1	16.2
USA	20.7	22.1	20.2	19.2	19.0	20.0	19.3	18.9	18.1	16.7	17.3	16.7	16.0	16.1	16.2
Canada	15.5	16.7	17.2	15.2	15.3	16.8	16.6	16.9	16.3	15.3	15.5	15.6	15.5	15.6	15.6
Latin America	1.55	1.72	2.02	1.89	2.03	2.28	2.37	2.45	2.54	2.45	2.59	2.63	2.71	2.71	2.72
Mexico	1.75	2.06	2.91	2.95	3.08	3.56	3.83	3.93	3.88	3.75	3.83	3.94	3.91	3.78	3.60
Brazil	0.89	1.08	1.37	1.23	1.40	1.66	1.65	1.71	1.79	1.65	1.87	1.94	2.09	2.21	2.31
Chile	2.16	1.99	1.92	2.23	2.57	3.16	3.35	3.80	3.97	3.79	4.01	4.36	4.43	4.65	4.25
Peru	1.12	1.12	1.17	0.88	0.97	1.02	1.04	1.09	1.23	1.30	1.40	1.49	1.46	1.47	1.54
Europe	7.81	8.44	9.30	9.29	7.54	7.27	7.45	7.53	7.47	6.86	7.12	7.08	6.96	6.81	6.46
Europe OECD	8.08	8.63	8.65	7.80	7.47	7.47	7.52	7.41	7.23	6.70	6.88	6.59	6.54	6.38	6.05
UK	11.1	11.3	10.1	9.57	8.85	8.85	8.79	8.50	8.22	7.38	7.60	6.93	7.25	7.02	6.31
Germany	12.5	13.3	13.4	11.9	10.5	10.0	9.67	9.47	9.60	8.95	9.45	9.11	9.26	9.47	8.93
France	8.07	8.89	8.25	5.93	5.77	5.99	5.87	5.52	5.43	5.16	5.23	4.75	4.75	4.81	4.32
Italy	5.35	5.99	6.29	6.86	7.05	7.38	7.84	7.51	7.24	6.44	6.55	6.39	6.08	5.56	5.26
Europe non-OECD	7.40	8.16	10.3	11.5	7.64	6.97	7.34	7.71	7.85	7.13	7.50	7.88	7.66	7.52	7.14
Former Soviet Union	7.98	8.83	11.1	12.5	8.27	7.53	7.84	8.23	8.40	7.61	8.06	8.42	8.21	8.11	7.68
Russia	N.A.	N.A.	N.A.	14.59	10.43	10.06	10.32	10.74	10.88	10.09	10.70	11.22	10.83	10.69	10.20
Africa	0.67	0.73	0.84	0.84	0.80	0.81	0.93	0.94	0.98	0.94	0.96	0.94	0.96	0.95	0.96
South Africa	6.95	7.54	7.56	6.93	6.64	6.38	7.86	8.04	8.58	7.98	8.01	7.65	7.79	7.96	8.10
Middle East	1.49	1.80	3.44	4.22	5.18	5.45	6.35	6.72	6.98	7.15	7.26	7.33	7.49	7.54	7.72
Iran	1.33	1.68	2.29	3.05	4.05	4.74	5.96	6.69	6.72	6.87	6.71	6.75	6.73	6.94	7.12
Saudi Arabia	2.08	2.62	10.03	9.23	10.2	11.0	12.0	12.8	13.6	13.8	14.9	15.1	15.7	15.6	16.4
Asia	0.99	1.08	1.26	1.57	1.89	1.98	2.64	2.97	2.99	3.10	3.32	3.53	3.59	3.67	3.72
China	0.93	0.98	1.39	1.83	2.40	2.44	4.11	4.91	4.99	5.28	5.76	6.30	6.38	6.62	6.66
Japan	7.15	8.24	7.43	8.42	8.83	9.00	9.22	9.43	8.75	8.28	8.68	9.12	9.48	9.66	9.35
Hong Kong	2.28	2.27	2.88	5.84	5.93	6.05	6.07	6.37	6.16	6.63	5.98	6.45	6.30	6.41	6.62
Taiwan	2.00	2.46	4.01	5.49	7.28	9.77	11.2	11.5	11.0	10.4	11.1	11.0	10.6	10.6	10.7
South Korea	1.61	2.00	3.29	5.41	7.92	9.18	9.50	9.8	10.0	10.2	11.2	11.5	11.5	11.4	11.3
Singapore	2.87	3.70	5.24	9.50	10.66	10.46	8.87	8.59	8.13	8.09	8.72	9.02	8.65	8.57	8.29
Brunei	2.93	4.63	13.67	12.68	15.26	13.37	13.32	18.29	18.95	19.20	17.46	17.57	17.16	16.67	16.06
Indonesia	0.21	0.26	0.46	0.74	1.04	1.21	1.41	1.52	1.49	1.53	1.56	1.57	1.58	1.59	1.72
Malaysia	1.14	1.11	1.71	2.72	3.84	4.91	6.04	6.66	7.00	6.14	6.75	6.70	6.65	7.09	7.37
Philippines	0.62	0.70	0.70	0.61	0.82	0.87	0.83	0.78	0.79	0.78	0.83	0.82	0.84	0.92	0.97
Thailand	0.43	0.52	0.71	1.43	2.36	2.43	3.04	3.16	3.24	3.11	3.35	3.31	3.56	3.67	3.60
India	0.32	0.32	0.38	0.61	0.74	0.85	0.94	1.07	1.12	1.25	1.30	1.34	1.42	1.45	1.56
Vietnam	0.37	0.38	0.28	0.26	0.38	0.57	0.96	1.07	1.19	1.30	1.45	1.43	1.41	1.45	1.58
Oceania	9.77	10.5	12.4	13.7	14.2	15.8	16.6	16.7	16.5	16.3	15.8	15.5	15.3	14.9	14.4
Australia	10.9	11.6	14.0	15.1	15.8	17.5	18.3	18.5	18.2	18.1	17.6	17.2	16.9	16.5	15.8
New Zealand	4.71	5.62	5.24	6.45	6.48	7.50	8.13	7.70	7.83	7.05	6.96	6.75	7.07	6.94	7.01
OECD 34	10.4	11.2	10.7	10.3	10.3	10.8	10.7	10.7	10.3	9.63	9.95	9.76	9.59	9.55	9.36
Non-OECD	1.43	1.53	1.90	2.11	2.00	1.99	2.49	2.74	2.80	2.83	3.00	3.14	3.17	3.22	3.24
EU 28	N.A.	N.A.	N.A.	8.42	7.89	7.77	7.92	7.76	7.57	6.98	7.17	6.86	6.77	6.60	6.22
EU 15	N.A.	N.A.	N.A.	8.29	8.08	8.17	8.24	7.96	7.76	7.14	7.32	6.92	6.87	6.72	6.29
Euro zone 19	N.A.	N.A.	N.A.	8.18	7.85	7.97	8.11	7.86	7.68	7.09	7.28	6.95	6.84	6.71	6.33
APEC 20	N.A.	N.A.	N.A.	5.17	5.29	5.51	6.34	6.75	6.68	6.56	6.96	7.21	7.16	7.29	7.28
ASEAN 9	0.376	0.420	0.558	0.829	1.17	1.34	1.59	1.69	1.72	1.69	1.80	1.80	1.82	1.88	1.97
World	3.71	3.95	3.99	3.88	3.75	3.79	4.16	4.35	4.32	4.21	4.40	4.48	4.46	4.49	4.47

Note:

For the figures in the shadowed columns, the values are calculated by dividing the total CO₂ emissions of each country in the group by total population of each country, as the source data do not pertain the same group.

Source: CO₂ Emissions from Fuel Combustion Highlights 2016

2.05 Carbon dioxide emissions by source in major countries and regions

	(Unit: million t)				(FY2014)
	Transport sector ¹⁾	Bunker oil ²⁾	Energy conversion ³⁾	Industry ⁴⁾	Others ⁵⁾
Canada	176.4	3.4	214.9	66.8	96.7
Mexico	151.2	12.3	189.9	58.0	31.9
USA	1,728.8	113.4	2,380.6	448.0	618.9
Japan	208.4	30.6	631.1	228.0	121.1
South Korea	92.4	40.2	343.4	77.5	54.4
Australia	92.5	14.0	218.1	42.9	20.2
New Zealand	14.0	3.4	7.4	6.8	3.0
Austria	22.3	2.0	19.8	10.7	8.0
Belgium	25.0	21.3	22.6	18.1	21.7
Czech Republic	16.4	0.9	56.6	13.5	10.0
Denmark	11.4	5.0	15.6	3.4	4.1
Finland	10.8	2.2	22.9	7.6	4.0
France	121.2	22.7	39.4	44.8	80.3
Germany	154.5	31.4	350.5	90.0	128.2
Greece	16.3	8.3	38.3	6.0	5.3
Hungary	10.9	0.5	12.5	6.3	10.5
Iceland	0.8	0.6	0.0	0.6	0.6
Ireland	10.9	2.6	11.4	3.6	8.0
Italy	105.4	15.4	113.7	35.8	64.9
Luxembourg	6.2	1.2	0.8	0.9	1.4
Netherlands	29.5	51.4	68.0	21.8	29.1
Norway	14.0	2.0	12.9	5.7	2.7
Poland	43.7	2.2	155.2	28.7	51.5
Portugal	15.7	4.9	17.6	5.5	4.0
Slovakia	6.1	0.1	11.3	7.2	4.7
Spain	81.9	35.8	86.8	33.1	30.2
Sweden	19.9	7.6	9.1	6.5	1.9
Switzerland	16.9	4.7	3.5	5.1	12.2
Turkey	60.9	11.0	143.4	44.9	57.9
UK	116.0	39.4	171.0	39.1	81.6
North America	1,905.1	116.7	2,595.4	514.9	715.6
Europe (OECD members)	924.3	274.7	1,401.1	441.5	624.7
EU-28	870.6	265.3	1,315.7	406.0	567.6
OECD countries	3,428.5	498.3	5,463.1	1,386.7	1,577.3
Brazil	213.0	18.6	125.2	98.1	39.7
Russia	238.4	64.1	896.8	180.8	151.5
India	231.8	16.7	1,082.6	533.4	171.8
Indonesia	134.5	3.2	193.2	80.3	28.6
China*	787.9	87.0	4,779.9	2,890.0	677.0
South Africa	52.7	10.8	295.2	55.0	34.5
Europe and Eurasia (Non-OECD members)	381.1	87.3	1,405.4	335.6	324.0
Africa	286.3	43.0	557.9	139.8	121.3
Asia (except China)	693.1	222.3	1,920.8	889.5	303.5
Former Soviet Union	-	-	-	-	-
America (Non-OECD members)	434.3	74.1	377.6	234.9	127.0
Middle East	405.5	118.3	803.3	353.7	165.3
Non-OECD countries	2,988.3	632.1	9,845.0	4,843.5	1,718.2
World	7,547.3	1,130.4	15,308.1	6,230.1	3,295.5

Notes:

- Published data indicate anthropogenic emission of carbon dioxide only by energy use.
 - Emissions from the use of bunker oil for international navigation and aviation are excluded (except for "world").
 - Emission from the use of biomass fuel are excluded. Peat is included.
 - China* includes Hong Kong.
1. Regardless of the modes, emissions caused by fuel combustion from every transporting activities are included. However, bunker oil for international navigation and aviation are excluded;
It means to include domestic air, domestic marine transport, road transport, railway transport, and pipeline transport. "World" includes bunker oil for domestic navigation as well as international aviation.
 2. Bunker oil for international navigation and aviation.
 3. Power plants, heat supply plant, and oil refining.
 4. Manufacturing industry and constructing industry. Excludes oil refining.
 5. Emissions from commerce, public, agriculture, forestry, fishery, residence and other unidentified emission sources.

Source: "CO2 Emissions From Fuel Combustion Highlights 2016," IEA

2.06 Atmospheric concentrations and anthropogenic emission of CO₂

	Annual average concentration of CO ₂ (ppm)	Total (million t-CO ₂)	Anthropogenic emissions of CO ₂				
			Shares by emissions source (%)				
			Solid fuel	Liquid fuel	Natural gas	Flare gas	Cement manufacturing
1950	—	5,977	65.6	25.9	5.9	1.4	1.1
1955	—	7,487	59.1	30.6	7.3	1.5	1.5
1960	316.9	9,420	54.9	33.1	8.8	1.5	1.7
1965	320.0	11,477	46.6	38.9	10.8	1.8	1.9
1970	325.7	14,861	38.4	45.4	12.2	2.1	1.9
1971	326.3	15,429	37.0	46.3	12.6	2.1	2.0
1972	327.5	16,045	36.0	47.0	12.8	2.1	2.0
1973	329.7	16,918	34.3	48.6	12.7	2.4	2.1
1974	330.2	16,951	34.1	48.6	12.9	2.3	2.1
1975	331.1	16,852	36.4	46.4	13.1	2.0	2.1
1976	332.1	17,835	35.1	47.6	12.9	2.2	2.1
1977	333.8	18,429	35.1	47.7	12.9	2.1	2.1
1978	335.4	18,652	35.2	47.0	13.4	2.1	2.3
1979	336.8	19,686	35.1	47.4	13.4	1.8	2.2
1980	338.8	19,488	36.6	45.6	13.9	1.6	2.3
1981	340.0	18,891	37.3	44.4	14.7	1.2	2.3
1982	340.8	18,748	39.0	42.9	14.5	1.3	2.4
1983	342.4	18,678	39.2	42.7	14.5	1.1	2.5
1984	344.0	19,360	39.7	41.6	15.3	1.0	2.4
1985	345.5	19,943	41.1	40.2	15.4	0.9	2.4
1986	346.9	20,559	41.0	40.9	14.8	0.8	2.4
1987	348.6	21,091	41.1	40.1	15.5	0.8	2.5
1988	351.2	21,872	40.5	40.4	15.7	0.8	2.5
1989	352.8	22,356	40.3	40.3	16.2	0.7	2.6
1990	354.0	22,466	39.5	40.7	16.6	0.7	2.6
1991	335.3	22,796	37.7	41.9	17.1	0.7	2.6
1992	356.0	22,601	38.2	40.7	17.8	0.6	2.7
1993	356.7	22,594	37.3	40.9	18.3	0.6	2.9
1994	358.2	22,975	37.6	40.6	18.2	0.6	3.0
1995	360.0	23,459	38.2	40.1	18.1	0.6	3.1
1996	361.8	23,987	37.7	40.1	18.5	0.6	3.1
1997	362.9	24,387	37.5	40.6	18.2	0.6	3.1
1998	365.6	24,358	36.0	41.6	18.7	0.5	3.1
1999	367.6	24,237	35.6	41.4	19.2	0.5	3.3
2000	368.8	24,688	34.6	42.3	19.1	0.7	3.4
2001	370.4	25,274	35.5	41.3	19.1	0.7	3.4
2002	372.4	25,641	36.0	40.5	19.2	0.7	3.6
2003	375.0	27,038	36.5	40.1	18.9	0.7	3.7
2004	376.8	28,395	37.5	39.3	18.6	0.7	3.8
2005	378.8	29,484	38.7	38.2	18.5	0.7	4.0
2006	380.9	30,565	39.5	37.1	18.4	0.7	4.3
2007	382.7	31,178	40.2	36.1	18.4	0.8	4.5
2008	384.8	32,182	40.9	35.4	18.6	0.8	4.4
2009	386.3	31,889	41.3	35.0	18.2	0.8	4.8
2010	388.6	33,469	41.8	34.0	18.6	0.7	4.9
2011	390.4	34,844	42.7	33.0	18.5	0.7	5.2
2012	392.5	35,468	42.4	33.1	18.4	0.7	5.4
2013	395.2	35,838	42.2	32.9	18.5	0.7	5.7
2014	397.1	36,139	41.8	33.3	18.5	0.7	5.8
2015	399.4	—	—	—	—	—	—
2016	402.9	—	—	—	—	—	—

Notes:

- The standard observation point: Mauna Loa Island, Hawaii. (19. 32 north latitude and 155. 35 west longitude).
- For annual average CO₂ concentration, refer to the website (<http://www.esrl.noaa.gov/gmd/ccgg/trends/>) of NOAA Earth System Research Laboratory(NOAA / ESRL).
- ppm : One-millionth for dry air(by volume).
- For anthropogenic emission of CO₂, refer to the website (http://cdiac.ornl.gov/trends/emis/meth_reg.html) of The Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory(ORNL).
- Shares by emission source are estimates based on emissions by source, using the data by the Carbon Dioxide Information Analysis Center (CDIAC) of Oak Ridge National Laboratory.
- For 2014 and 2015, data of "Anthropogenic emissions of CO₂" were not disclosed to the public as of May 19, 2017.

Source: Compiled based on the data by NOAA/ESRL and data by the Carbon Dioxide Information Analysis Center (CDIAC) of Oak Ridge National Laboratory

2.07 Emissions of greenhouse gasses in major countries and regions

	(Unit : 1,000 t-CO ₂)							(2014)
	Carbon dioxide (CO ₂)	Methane (CH ₄)	Nitrous oxide (N ₂ O)	Hydro fluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Sulfur hexafluoride (SF ₆)	Nitrogen trifluoride (NF ₃)	Total ¹⁾
Canada	574,100	108,437	39,407	9,024	1,088	363	0	732,419
Mexico	-	-	-	-	-	-	0	-
USA	5,556,007	730,829	403,510	166,700	5,600	7,300	500	6,870,454
Japan	1,265,491	35,482	20,848	35,785	3,361	2,064	831	1,363,862
South Korea	-	-	-	-	-	-	0	-
Australia	393,127	98,076	20,085	10,787	193	130	0	522,397
New Zealand	35,617	34,813	9,066	1,517	73	18	0	81,104
Austria	64,263	6,623	3,427	1,653	53	302	11	76,333
Belgium	96,325	8,048	6,279	2,812	307	95	1	113,867
Czech Republic	101,154	13,239	6,324	2,830	5	96	2	123,651
Denmark	38,834	7,364	5,092	735	9	133	0	52,167
Finland	47,598	5,017	4,626	1,743	10	34	0	59,029
France	341,153	59,762	43,031	19,399	592	471	11	464,418
Germany	792,859	54,752	38,038	10,750	234	3,396	20	900,202
Greece	79,628	11,191	4,686	5,758	135	5	0	101,403
Hungary	43,573	7,614	4,502	1,428	2	104	0	57,224
Iceland	3,272	592	468	163	99	2	0	4,597
Ireland	36,624	13,433	6,985	1,155	9	46	0	58,254
Italy	342,827	43,252	18,585	11,978	1,564	354	28	418,587
Luxembourg	9,830	570	296	66	0	8	0	10,771
Netherlands	157,790	18,772	7,815	2,241	93	135	0	186,845
Norway	43,867	5,340	2,527	1,188	179	55	0	53,156
Poland	310,307	41,330	19,746	8,587	14	53	0	380,038
Portugal	47,203	12,066	3,417	1,750	0	56	0	64,492
Slovakia	33,347	4,363	2,357	546	11	14	0	40,639
Spain	253,467	38,166	19,967	17,053	66	207	0	328,926
Sweden	43,405	5,158	4,884	807	82	47	0	54,383
Switzerland	39,265	5,097	2,439	1,501	44	259	0	48,605
Turkey	382,213	57,138	23,283	4,917	-	-	0	467,550
United Kingdom	434,795	53,891	21,349	16,423	278	468	0	527,203
Chile	-	-	-	-	-	-	0	-
Estonia	18,919	1,102	820	217	-	2	0	21,059
Israel	-	-	-	-	-	-	0	-
Latvia	7,188	2,086	1,873	128	0	9	0	11,284
Slovenia	13,490	1,979	759	324	15	16	0	16,582
North America	6,130,106	839,265	442,917	175,724	6,688	7,663	500	7,602,873
Europe (OECD members)	3,361,385	415,641	226,841	110,568	3,786	6,340	74	4,124,788
EU-15	2,786,598	338,066	188,478	94,325	3,432	5,757	71	3,416,880
OECD countries	12,793,039	1,649,388	800,272	357,603	16,449	25,045	68	15,643,363

Notes:

Israel: Include LULUCF and Indirect gases.

Mexico: Include emissions or removals from Land-use change and forestry.

North America : Total value of Canada and USA.

Europe: Total sum of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland United Kingdom.

* excluding Estonia, Latvia and Slovenia.

OECD Total : Excludes Israel , including estimates.

1. Excluding emissions or removals from land-use, land-use change and forestry (LULUCF).

Source: "OECD Stat"

2.08 Anomalies of annual average land temperature in the World and Japan

Anomalies of annual average land temperature of the World.

(Unit : °C)			
Year	World	Northern Hemisphere	Southern Hemisphere
1891	-0.63	-0.68	-0.59
1892	-0.71	-0.80	-0.62
1893	-0.75	-0.87	-0.63
1894	-0.70	-0.73	-0.68
1895	-0.68	-0.75	-0.60
1896	-0.47	-0.53	-0.42
1897	-0.49	-0.53	-0.45
1898	-0.66	-0.65	-0.68
1899	-0.56	-0.58	-0.55
1900	-0.49	-0.48	-0.51
1901	-0.58	-0.55	-0.63
1902	-0.70	-0.75	-0.66
1903	-0.77	-0.78	-0.77
1904	-0.84	-0.88	-0.79
1905	-0.70	-0.72	-0.68
1906	-0.60	-0.59	-0.62
1907	-0.78	-0.85	-0.70
1908	-0.82	-0.84	-0.82
1909	-0.82	-0.84	-0.81
1910	-0.79	-0.78	-0.80
1911	-0.82	-0.79	-0.85
1912	-0.73	-0.83	-0.61
1913	-0.70	-0.79	-0.60
1914	-0.53	-0.57	-0.49
1915	-0.43	-0.47	-0.40
1916	-0.64	-0.70	-0.59
1917	-0.71	-0.77	-0.64
1918	-0.55	-0.61	-0.48
1919	-0.58	-0.68	-0.45
1920	-0.51	-0.56	-0.46
1921	-0.43	-0.39	-0.52
1922	-0.56	-0.56	-0.58
1923	-0.54	-0.54	-0.55
1924	-0.55	-0.53	-0.60
1925	-0.46	-0.42	-0.52
1926	-0.36	-0.33	-0.42
1927	-0.47	-0.43	-0.54
1928	-0.47	-0.47	-0.50
1929	-0.60	-0.62	-0.59
1930	-0.38	-0.33	-0.46
1931	-0.34	-0.31	-0.41
1932	-0.38	-0.38	-0.39
1933	-0.53	-0.57	-0.50
1934	-0.37	-0.37	-0.39
1935	-0.46	-0.45	-0.49
1936	-0.48	-0.43	-0.56
1937	-0.37	-0.32	-0.46
1938	-0.33	-0.26	-0.45
1939	-0.37	-0.34	-0.46
1940	-0.32	-0.39	-0.25
1941	-0.26	-0.31	-0.21
1942	-0.26	-0.31	-0.24
1943	-0.23	-0.21	-0.31
1944	-0.11	-0.15	-0.11
1945	-0.25	-0.33	-0.16
1946	-0.40	-0.36	-0.52
1947	-0.43	-0.43	-0.46
1948	-0.40	-0.36	-0.50
1949	-0.42	-0.40	-0.47
1950	-0.49	-0.52	-0.47
1951	-0.35	-0.31	-0.44
1952	-0.29	-0.31	-0.30
1953	-0.22	-0.18	-0.31
1954	-0.45	-0.43	-0.52
1955	-0.47	-0.42	-0.57

Note: Anomaly, also known as the deviation from normal, is a value obtained by subtracting normal from average temperature. As normal, an average for 30 years from 1981 to 2010 is used.

Source: Compiled from the materials below

World Meteorological Agency press release (updated on 2017/2/1)

http://www.data.jma.go.jp/cpdinfo/temp/list/an_wld.html

Japan Meteorological Agency press release (updated on 2017/1/4)

http://www.data.kishou.go.jp/climate/cpdinfo/temp/list/an_jpn.html

Anomalies of annual average land temperature of Japan.

(Unit : °C)			
Year	Japan	Year	Japan
1891		1956	-0.74
1892		1957	-0.76
1893		1958	-0.29
1894		1959	0.12
1895		1960	-0.22
1896		1961	0.18
1897		1962	-0.37
1898	-0.75	1963	-0.64
1899	-0.81	1964	-0.29
1900	-1.06	1965	-0.99
1901	-1.03	1966	-0.53
1902	-1.03	1967	-0.47
1903	-0.77	1968	-0.64
1904	-0.86	1969	-0.79
1905	-0.95	1970	-0.75
1906	-1.33	1971	-0.68
1907	-1.22	1972	-0.14
1908	-1.44	1973	-0.30
1909	-1.14	1974	-0.91
1910	-1.22	1975	-0.35
1911	-0.70	1976	-0.87
1912	-1.12	1977	-0.41
1913	-1.59	1978	-0.16
1914	-0.20	1979	0.20
1915	-0.56	1980	-0.78
1916	-0.14	1981	-0.98
1917	-1.31	1982	-0.33
1918	-1.09	1983	-0.49
1919	-0.74	1984	-0.99
1920	-0.51	1985	-0.37
1921	-1.08	1986	-0.95
1922	-0.58	1987	-0.13
1923	-0.76	1988	-0.65
1924	-1.01	1989	0.16
1925	-0.94	1990	0.78
1926	-1.32	1991	0.25
1927	-0.93	1992	-0.11
1928	-0.62	1993	-0.52
1929	-0.87	1994	0.56
1930	-0.33	1995	-0.19
1931	-1.04	1996	-0.54
1932	-0.72	1997	0.10
1933	-0.64	1998	0.75
1934	-1.14	1999	0.49
1935	-0.76	2000	0.28
1936	-1.10	2001	-0.05
1937	-0.37	2002	0.29
1938	-0.54	2003	-0.06
1939	-0.68	2004	0.77
1940	-0.85	2005	-0.01
1941	-0.79	2006	0.20
1942	-0.67	2007	0.61
1943	-0.86	2008	0.22
1944	-1.09	2009	0.30
1945	-1.57	2010	0.61
1946	-0.36	2011	0.13
1947	-1.42	2012	0.04
1948	-0.08	2013	0.34
1949	-0.65	2014	0.14
1950	-0.29	2015	0.69
1951	-0.62	2016	0.88
1952	-0.74		
1953	-0.74		
1954	-0.53		
1955	-0.12		

2.09 Shipping volume of CFC in Japan (1)

Shipment volume of CFC (* ChloroFluorCarbon = CFC)

(Unit : in ton)

	CFC-11						CFC-12					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1985	2,139	4,283	18,295	200	291	25,208	18,834	7,059	8,269	0	149	34,311
1986	2,573	4,439	21,211	305	873	29,401	21,439	7,157	9,292	0	315	38,203
1987	2,802	4,511	25,609	503	806	34,231	22,716	7,042	11,004	0	178	40,940
1988	2,348	4,218	25,232	1,236	1,303	34,337	20,708	7,401	12,115	0	990	41,214
1989	3,051	3,807	23,541	1,156	930	32,485	24,880	6,585	9,606	0	335	41,406
1990	2,444	1,120	19,235	411	401	23,611	18,480	3,461	5,646	0	0	27,587
1991	2,156	653	17,286	713	158	20,966	15,495	2,544	2,825	81	501	21,446
1992	1,950	299	11,366	477	86	14,178	15,091	1,286	1,253	88	288	18,006
1993	2,305	93	8,557	531	14	11,500	20,109	1,016	261	75	249	21,710
1994	785	46	8,212	363	0	9,406	9,694	1,013	104	0	45	10,856
1995	493	299	6,850	23	88	7,753	4,678	423	101	0	174	5,376
1996	7	40	749	1	8	805	1,731	119	1	29	16	1,896
1997	7	95	189	0	17	308	484	172	0	0	16	672
1998	11	19	5	0	0	35	509	33	0	0	0	542
1999	0	34	7	0	4	45	58	62	0	0	5	125
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-

	CFC-113						CFC-114					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1985	155	143	197	54,749	1,544	56,788	130	131	1,382	0	10	1,653
1986	144	159	176	62,182	917	63,578	134	150	1,318	0	11	1,613
1987	130	171	251	76,707	2	77,261	117	542	1,871	0	0	2,530
1988	115	23	276	79,968	3	80,385	141	401	2,057	0	60	2,659
1989	108	227	210	82,927	19	83,491	161	588	1,975	0	14	2,738
1990	168	160	224	57,177	75	57,804	57	41	1,424	0	0	1,522
1991	70	81	246	50,371	0	50,768	179	24	1,465	0	1	1,669
1992	93	9	274	26,462	0	26,838	194	17	690	0	1	902
1993	72	9	31	11,655	34	11,801	193	15	246	0	1	455
1994	204	4	21	10,709	4	10,942	43	15	17	0	256	331
1995	13	0	48	11,654	52	11,767	22	19	5	0	191	237
1996	0	0	0	1,598	179	1,777	24	12	0	0	4	40
1997	0	0	0	281	22	303	0	55	0	0	0	55
1998	0	0	0	91	0	91	0	0	0	0	0	0
1999	0	0	0	14	1	15	0	0	0	0	0	0
2000	-	-	-	-	-	-	-	-	-	-	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	-	-	-	-	-	-	-	-	-	-	-
2003	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	-	-	-	-	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-	-	-
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-

	CFC-115						CFC Total					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1985	93	0	0	0	2	95	21,351	11,616	28,143	54,949	1,996	118,055
1986	119	0	0	0	11	130	24,409	11,905	31,997	62,487	2,127	132,925
1987	610	0	0	0	0	610	26,375	12,266	38,735	77,210	986	155,572
1988	616	0	0	0	9	625	23,928	12,043	39,680	81,204	2,365	159,220
1989	601	0	0	0	0	601	28,801	11,207	35,332	84,083	1,298	160,721
1990	686	0	0	0	0	686	21,835	4,782	26,529	57,588	476	111,210
1991	728	0	0	0	1	729	18,628	3,302	21,822	51,165	661	95,578
1992	679	0	0	0	1	680	18,007	1,611	13,583	27,027	376	60,604
1993	409	0	0	0	0	409	23,088	1,133	9,095	12,261	298	45,875
1994	214	0	0	0	0	214	10,940	1,078	8,354	11,072	305	31,749
1995	335	0	0	0	0	335	5,541	741	7,004	11,677	505	25,468
1996	39	0	0	0	0	39	1,801	171	750	1,628	207	4,557
1997	6	0	0	0	0	6	497	322	189	281	55	1,344
1998	0	0	0	0	0	0	520	52	5	91	0	668
1999	0	0	0	14	1	15	58	96	7	28	11	200
2000	-	-	-	-	-	-	40	0	0	5	26	71
2001	-	-	-	-	-	-	0	0	0	0	0	0
2002	-	-	-	-	-	-	0	0	0	0	0	0
2003	-	-	-	-	-	-	0	0	0	0	0	0
2004	-	-	-	-	-	-	0	0	0	0	0	0
2005	-	-	-	-	-	-	0	0	0	0	0	0
2006	-	-	-	-	-	-	0	0	0	0	0	0
2007	-	-	-	-	-	-	0	0	0	0	0	0

Note: In 2000 and 2007, calculation method has been changed, and now only total shipment volumes of CFC, HCFC, and HFC are shown.

2.09 Shipping volume of CFC in Japan (2)

Shipment volume of HCFC (* Hydro Chlorofluorocarbon = CFC)

(Unit : in 1,000 tons)

	HCFC-22						HCFC-141b					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	30.6	—	0.8	0.0	0.1	31.5	0.0	—	8.6	2.1	0.0	10.7
1996	31.7	—	0.6	0.0	0.3	32.6	0.0	—	13.5	3.2	0.1	16.8
1997	28.4	—	0.5	0.0	1.5	30.4	0.0	—	14.8	3.0	0.0	17.8
1998	27.5	—	0.4	0.0	1.6	29.5	0.0	—	12.9	3.3	—	16.2
1999	26.8	—	0.3	0.0	1.7	28.8	0.0	—	11.9	4.0	—	15.9
2000	24.0	—	0.0	—	2.0	26.0	0.0	—	11.0	3.0	0.0	15.0
2001	21.6	—	0.2	0.0	1.2	23.0	0.0	—	9.3	3.0	0.2	12.5
2002	15.6	—	0.2	0.0	0.7	16.5	0.0	—	9.3	3.0	0.0	12.4
2003	13.7	—	0.1	0.0	1.2	15.0	0.0	—	11.5	3.0	0.0	14.5
2004	12.7	0.0	0.0	0.0	1.2	14.0	0.0	0.0	0.7	2.3	0.0	3.1
2005	10.8	0.0	0.0	0.0	1.2	12.0	0.0	0.0	0.0	2.3	0.0	2.3
2006	9.1	0.0	0.0	0.0	0.1	9.2	0.0	0.0	0.0	2.5	0.0	2.5
2007	—	—	—	—	—	—	—	—	—	—	—	—

	HCFC-142b						HCFC-225					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	0.0	—	3.7	0.0	0.1	3.8	0.0	—	0.0	1.2	0.0	1.2
1996	0.0	—	3.9	0.0	0.1	4.0	0.0	—	0.0	2.0	0.0	2.0
1997	0.0	—	3.8	0.0	0.2	4.1	0.0	—	0.0	2.8	0.0	2.8
1998	0.0	—	3.4	0.0	0.2	3.6	0.0	—	0.0	2.6	0.0	2.6
1999	—	—	3.7	0.0	0.7	4.4	0.0	—	0.0	3.0	0.1	3.1
2000	—	—	—	—	—	—	—	—	—	—	—	—
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—	—	—	—	—	—
2007	—	—	—	—	—	—	—	—	—	—	—	—

	HCFC-123						HCFC-124					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	0.5	—	0.0	0.0	0.0	0.5	0.0	—	0.0	0.0	0.0	0.0
1996	0.5	—	0.0	0.0	0.0	0.5	0.0	—	0.0	0.0	0.0	0.0
1997	0.4	—	0.0	0.0	0.0	0.4	0.0	—	0.0	0.0	0.0	0.0
1998	0.4	—	0.0	—	—	0.4	—	—	0.0	0.0	—	—
1999	0.3	—	—	0.0	—	0.3	—	—	0.1	0.0	0.0	0.1
2000	—	—	—	—	—	—	—	—	—	—	—	—
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—	—	—	—	—	—
2007	—	—	—	—	—	—	—	—	—	—	—	—

	HCFC-142b,225,123,124 Total						HCFC Total					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	0.5	—	3.7	1.2	0.1	5.5	31.1	—	13.1	3.3	0.2	47.7
1996	0.5	—	3.9	2.0	0.1	6.5	32.2	—	18.0	5.2	0.5	55.9
1997	0.4	—	3.9	2.8	0.2	7.3	28.8	—	19.2	5.8	1.7	55.5
1998	0.4	—	3.4	2.6	0.2	6.6	27.9	—	16.7	5.9	1.8	52.3
1999	0.3	—	3.8	3.0	0.8	7.9	27.1	—	16.0	7.0	2.5	52.6
2000	0.0	—	4.0	3.0	1.0	7.0	25.0	—	15.0	6.0	2.0	48.0
2001	0.3	—	3.5	2.2	0.7	6.7	21.9	—	13.0	5.2	2.0	42.1
2002	0.2	—	2.9	2.0	0.1	5.2	15.8	—	12.3	5.0	0.8	34.1
2003	0.2	—	1.4	1.6	0.2	3.4	13.9	—	13.0	4.6	1.4	32.9
2004	0.2	0.1	0.4	2.8	0.0	3.4	12.9	0.1	1.1	5.1	1.3	20.5
2005	0.2	0.1	0.0	2.3	0.2	2.8	11.0	0.1	0.0	4.6	1.4	17.1
2006	0.2	0.1	0.0	1.3	0.1	1.7	9.3	0.1	0.0	3.8	0.1	13.3
2007	—	—	—	—	—	—	8.0	0.1	0.0	3.4	0.3	11.8

Note: In 2000 and 2007, calculation method has been changed, and now only total shipment volumes of CFC, HCFC, and HFC are shown.

2.09 Shipping volume of CFC in Japan (3)

Shipment volume of HFC (* Hydro Fluorocarbon = HFC)

(Unit : in 1,000 tons)

	HFC-134a						Other HFC					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	7.8	1.2	0.3	0.0	0.0	9.3	0.1	0.0	0.0	0.0	0.1	0.2
1996	8.6	1.8	0.4	0.0	0.0	10.8	0.1	0.0	0.0	0.0	0.1	0.2
1997	8.9	2.2	0.4	0.0	0.0	11.5	0.2	0.0	0.0	0.0	0.2	0.4
1998	8.4	2.5	0.5	0.0	0.0	11.4	0.4	0.0	0.0	0.2	0.3	0.9
1999	9.6	3.1	0.6	0.0	0.2	13.5	1.0	0.0	—	—	0.2	1.2
2000	—	—	—	—	—	—	—	—	—	—	—	—
2001	—	—	—	—	—	—	—	—	—	—	—	—
2002	—	—	—	—	—	—	—	—	—	—	—	—
2003	—	—	—	—	—	—	—	—	—	—	—	—
2004	—	—	—	—	—	—	—	—	—	—	—	—
2005	—	—	—	—	—	—	—	—	—	—	—	—
2006	—	—	—	—	—	—	—	—	—	—	—	—
2007	—	—	—	—	—	—	—	—	—	—	—	—

	HFC Total					
	Refrigerant	Aerosol	Foaming agent	Detergent	Other	Total
1995	7.9	1.2	0.3	0.0	0.1	9.5
1996	8.7	1.8	0.4	0.0	0.1	11.0
1997	9.1	2.2	0.4	0.0	0.2	11.9
1998	8.8	2.5	0.5	0.2	0.3	12.3
1999	10.6	3.1	0.6	0.0	0.4	14.7
2000	11.0	3.0	1.0	0.0	1.0	16.0
2001	14.0	2.9	0.7	0.0	0.2	17.9
2002	18.0	3.1	0.8	0.1	0.5	22.5
2003	19.2	2.9	1.5	0.1	0.5	24.2
2004	21.0	2.4	3.3	0.3	0.5	27.5
2005	22.8	2.3	5.2	0.3	0.1	30.7
2006	23.5	2.0	7.6	0.8	0.3	34.1
2007	24.9	1.4	6.9	0.8	0.2	34.3

Note: In 2000 and 2007, calculation method has been changed, and now only total shipment volumes of CFC, HCFC, and HFC are shown.

Source: "The Annual Report of Ozone Monitoring result in the FY 2011," Ministry of the Environment

2.10 Production and consumption volumes of HCFC in Japan

(Unit: ODP ton) ¹⁾		
	Production	Consumption ²⁾
Basis volume ³⁾		5,562
January 1996 – December 1996		4,141
January 1997 – December 1997		4,152
January 1998 – December 1998	3,966	3,633
January 1999 – December 1999	4,608	3,899
January 2000 – December 2000	3,928	3,531
January 2001 – December 2001	3,792	3,500
January 2002 – December 2002	3,195	2,907
January 2003 – December 2003	3,145	2,810
January 2004 – December 2004	1,921	1,473
January 2005 – December 2005	1,344	1,118
January 2006 – December 2006	872	747
January 2007 – December 2007	728	770
January 2008 – December 2008	777	787
January 2009 – December 2009	494	518
January 2010 – December 2010	400	453
January 2011 – December 2011	397	470
January 2012 – December 2012	297	342
January 2013 – December 2013	294	335
January 2014 – December 2014	252	283
January 2015 – December 2015	213	255

Notes:

1) ODP ton is a sum of production and consumption amounts of each HCFC substance multiplied by relevant ozone depletion potential (ODP).

2) Consumption = production + import – export

3) Basis volume of HCFC consumption = "the estimated consumption of HCFC in 1989" + "the estimated consumption of CFC in 1989" × 0.028

Source: "The Annual Report of Result of Ozone Monitoring in 2015," Ministry of the Environment, and a web page of Ministry of Economy, Trade and Industry

2.11 Changes in production volume of major CFCs in the world

(Unit: t)

Year	CFC-11	CFC-12	CFC-113	CFC-114	CFC-115	HCFC-22	HCFC-124	HCFC-141b	HCFC-142b	HFC-134a	HFC-125	HFC-143a
1931~1935	90	2,676										
1936~1940	590	16,102										
1941~1945	1,724	57,244										
1946~1950	16,149	122,244										
1951	9,072	36,242										
1952	13,562	37,240										
1953	17,282	46,493										
1954	20,911	49,124										
1955	26,263	57,606										
1956	32,477	68,674										
1957	33,929	74,163										
1958	29,529	73,437										
1959	35,562	87,589										
1960	49,714	99,428										
1961	60,464	108,499										
1962	76,109	128,095										
1963	93,304	146,420										
1964	111,085	170,097										
1965	122,833	190,056										
1966	141,022	216,182										
1967	159,756	242,763										
1968	183,116	267,484										
1969	217,271	297,285										
1970	238,136	321,099				56,071						
1971	263,175	341,556				60,582						
1972	306,856	379,884				63,250						
1973	349,085	423,338				74,346						
1974	369,724	442,798				83,390						
1975	314,068	380,973				74,989						
1976	339,832	410,729				90,706						
1977	320,464	382,833				101,375						
1978	308,852	372,082				111,662						
1979	289,483	357,159	*1 706,830	*1 319,830	*1 57,533	117,892						
1980	289,619	350,219	103,667	14,994	9,342	126,323						
1981	286,943	351,308	108,536	14,011	9,955	130,811			2,587			
1982	271,443	328,039	112,987	13,580	10,366	123,616			1,898			
1983	291,731	355,331	132,743	14,774	11,629	143,881			2,204			
1984	312,355	382,107	171,122	15,573	11,221	152,356			2,352			
1985	326,814	376,339	187,011	17,091	10,036	153,432			1,370			
1986	350,148	398,363	196,614	19,101	11,818	164,993			7,121			
1987	382,050	424,726	225,812	17,098	12,772	173,304			6,883			
1988	375,986	421,002	247,444	16,483	13,550	203,545			7,841			
1989	302,489	379,778	251,326	14,963	14,191	219,537			10,288			
1990	232,916	230,950	174,801	8,311	11,347	213,714		99	18,757	189		
1991	213,486	224,805	147,625	6,658	12,276	236,812	17	1,507	27,154	2,198		
1992	186,434	216,207	107,507	4,691	10,711	245,715	99	13,254	30,691	6,404		
1993	147,131	214,664	48,037	4,576	11,411	240,619	532	43,291	33,682	26,526		
1994	60,232	133,600	29,547	3,207	6,834	239,444	897	81,231	38,361	50,400		
1995	32,683	82,822	23,321	3,135	3,651	243,468	3,078	113,154	38,711	73,769		
1996	22,123	48,856	6,007	713	2,019	267,523	4,834	121,085	37,736	83,674	*2 0	*2 794
1997	18,577	32,900	3,008	1,196	836	246,937	4,143	122,356	40,197	97,949	296	339
1998	14,600	33,269	1,589	1,199	922	271,980	5,181	129,037	38,771	112,174	698	557
1999	12,871	27,132	1,000	292	396	248,552	2,776	130,415	40,166	131,710	1,243	750
2000	9,900	24,564	942	505	213	239,197	3,131	132,476	40,517	130,056	7,400	5,396
2001	8,311	20,873	787	280	237	213,328	2,064	121,757	33,616	133,956	12,583	9,151
2002	6,795	20,181	917	608	145	193,955	2,736	116,673	21,417	156,987	16,190	9,656
2003	3,145	12,536	599	336	37	187,262	2,765	74,596	19,685	166,899	22,631	12,972
2004	2,043	8,938	-	1,114	-	189,545	2,529	40,417	21,539	173,851	32,734	14,053
2005	-	-	-	-	-	176,373	1,878	25,619	22,112	169,999	31,819	16,321
2006	-	-	-	-	-	165,478	2,134	22,548	22,257	156,573	38,537	16,257
2007	-	-	-	-	-	165,862	2,120	21,835	33,779	158,161	42,573	18,325
Total	8,714,314	11,507,103	-	514,319	-	6,411,825	40,914	1,311,350	601,693	1,831,475	206,704	103,776

Note:

*1 The sum up to 1979.

*2 The sum up to 1996.

The data and the total of CFC-113 and CFC-115 in 2004 and 2005 are not published.

The data and the total of CFC-11, CFC-12, and CFC-114 in 2005 are not published.

Source: "The Alternative Fluorocarbons Environmental Acceptability Study," AFEAS

2.12 Emissions of Ozone Depleting Substances on PRTR basis

(Unit: t)

Substance		Emissions notified ¹⁾		Emissions outside notification ²⁾	Total emissions	Transferred amount notified ³⁾
		Air	Public Water Areas			
CFC	FY2003	51	1	3,526	3,578	65
	2004	80	1	2,577	2,659	48
	2005	49	2	1,815	1,866	109
	2006	38	1	1,490	1,529	77
	2007	23	0	1,227	1,250	98
	2008	19	1	1,353	1,372	51
	2009	32	0	1,197	1,230	58
	2010	17	0	2,330	2,348	2
	2011	9	0	2,177	2,186	5
	2012	10	0	2,046	2,056	6
	2013	9	0	1,522	1,531	2
	2014	13	0	1,478	1,491	20
	2015	7	0	1,390	1,396	0
Halon	FY2003	7	0	13	20	0
	2004	9	0	19	28	14
	2005	12	0	12	24	4
	2006	8	0	13	22	4
	2007	11	0	15	26	2
	2008	11	0	13	24	2
	2009	13	0	9	23	2
	2010	27	0	11	38	1
	2011	15	0	13	28	10
	2012	10	0	5	15	0
	2013	11	0	11	22	2
	2014	6	0	7	13	0
	2015	6	0	10	16	0
HCFC	FY2003	3,953	2	15,571	19,526	451
	2004	2,867	2	14,961	17,831	409
	2005	2,429	3	15,545	17,977	352
	2006	2,088	0	15,262	17,350	353
	2007	1,910	0	14,413	16,323	357
	2008	1,570	0	20,384	21,953	303
	2009	1,306	0	18,283	19,589	280
	2010	1,184	0	18,639	19,823	172
	2011	1,009	0	17,069	18,079	117
	2012	912	0	15,726	16,638	149
	2013	973	0	12,982	13,956	152
	2014	824	0	11,727	12,552	160
	2015	739	0	10,005	10,744	203
Carbon tetrachloride	FY2003	46	1	0	47	166
	2004	22	1	0	22	211
	2005	7	1	0	8	244
	2006	15	1	0	16	227
	2007	9	1	0	9	411
	2008	6	0	0	6	229
	2009	6	0	0	7	170
	2010	7	0	0	7	391
	2011	7	0	0	7	198
	2012	7	0	0	7	325
	2013	7	0	0	7	289
	2014	6	0	0	6	290
	2015	6	0	0	6	260
1, 1, 1-trichloroethane	FY2003	21	21	0	42	23
	2004	20	14	0	35	32
	2005	16	14	0	30	9
	2006	9	13	0	22	17
	2007	8	9	0	17	19
	2008	8	11	0	19	18
	2009	3	11	0	13	0
	2010	4	11	0	14	1
	2011	0	12	0	13	0
	2012	0	14	0	14	0
	2013	0	14	0	15	0
	2014	0	16	0	17	0
	2015	1	16	0	17	0
Methyl bromide	FY2003	559	0	2,666	3,225	23
	2004	475	0	2,631	3,105	19
	2005	413	0	2,747	3,159	10
	2006	329	0	1,493	1,821	5
	2007	279	0	1,343	1,622	7
	2008	217	0	1,054	1,271	8
	2009	222	0	855	1,078	5
	2010	223	0	681	904	7
	2011	181	0	700	881	6
	2012	147	0	690	838	6
	2013	127	0	488	615	6
	2014	119	0	443	563	8
	2015	114	0	377	492	8

Notes:

- 1) The amount of emissions released into the environment over a year from business entities subject to PRTR, which was notified to the state by them.
- 2) The state's estimated amount of emissions released from business entities not subject to PRTR.
- 3) The carried-away amount as waste from business entities subject to PRTR.

Source: "PRTR Data Overview (FY 2003 to 2015)," Ministry of the Environment

2.13 Chronological changes in Background Concentration of Specified Substances in the Atmosphere in Hokkaido (1)

Sampling period	CFC-11		CFC-12		CFC-113		CFC-114		CFC-115		Halon 1211		Halon 1301		
	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	Concentra-tion	Standard deviation	
1989	Jan	246	4	500	1	74	1	14.3	0.30	5.30	0.10	2.40	0.120	1.90	0.030
	Mar	247	2	501	7	76	1	14.3	0.20	5.80	0.10	2.50	0.041	1.90	0.050
	Oct	254	6	509	8	85	3	14.6	0.20	5.70	0.30	2.70	0.070	2.00	0.100
1990	Jan	255	3	504	4	75	2	14.7	0.20	6.00	0.30	2.70	0.040	2.10	0.060
	Mar	252	3	503	3	75	1	14.8	0.10	5.90	0.10	2.80	0.010	2.10	0.020
	Oct	264	6	509	2	79	1	14.8	0.10	6.20	0.30	2.80	0.040	2.20	0.040
1991	Jan	264	4	510	2	79	1	14.8	0.10	6.20	0.50	2.90	0.080	2.20	0.030
	Mar	264	3	511	4	81	1	14.9	0.30	6.30	0.30	2.90	0.050	2.30	0.050
	Aug	262	2	516	5	80	1	14.7	0.10	6.40	0.10	2.90	0.050	2.20	0.020
1992	Jan	266	5	520	3	84	1	14.9	0.30	6.60	0.20	3.10	0.080	2.40	0.020
	Mar	267	2	519	5	85	2	15.1	0.10	6.50	0.10	3.20	0.100	2.40	0.060
	Aug	270	4	525	2	87	-	15.0	0.10	7.10	0.40	3.20	0.030	2.40	0.070
1993	Jan	271	6	530	3	85	1	14.9	0.20	7.00	0.20	3.40	0.070	2.60	0.030
	Mar	264	2	526	6	86	1	15.0	0.30	7.10	0.10	3.40	0.080	2.60	0.060
	Aug	264	2	529	3	85	1	15.0	0.10	7.20	0.30	3.30	0.030	2.60	0.020
1994	Jan	269	3	537	5	86.1	-	15.1	0.22	7.58	0.37	3.52	0.120	2.70	0.014
	Mar	266	6	534	3	86.3	0.9	15.1	0.32	7.51	0.40	3.54	0.041	2.64	0.062
	Jul	266	7	539	4	86.5	1.7	15.1	0.25	7.57	0.24	3.58	0.074	2.68	0.051
1995	Jan	266	2	541	5	86.2	1.5	15.0	0.20	7.61	0.23	3.67	0.080	2.72	0.050
	Mar	265	3	543	4	86.0	2.0	15.1	0.35	7.67	0.19	3.75	0.054	2.74	0.045
	Aug	262	4	543	5	86.2	1.4	15.0	0.20	7.76	0.11	3.78	0.100	2.74	0.089
1996	Jan	262	1	541	4	84.5	1.2	15.2	0.16	7.89	0.09	3.88	0.042	2.80	0.071
	Mar	262	2	541	4	85.4	1.1	15.2	0.16	8.04	0.29	3.87	0.090	2.82	0.058
	Aug	265	3	542	4	84.4	2.1	15.0	0.21	8.04	0.18	3.91	0.083	2.79	0.019
1997	Jan	261	1	549	3	84.9	1.6	15.2	0.12	8.38	0.08	4.02	0.099	2.86	0.039
	Mar	261	2	548	3	84.1	0.6	15.2	0.21	8.32	0.07	4.00	0.044	2.83	0.031
	Aug	263	3	552	6	84.5	1.2	15.0	0.34	8.33	0.03	4.08	0.094	2.87	0.046
1998	Jan	257	3	548	4	84.6	0.7	15.2	0.11	8.27	0.39	4.20	0.050	2.94	0.077
	Mar	256	1	547	4	84.6	0.4	15.2	0.22	8.56	0.12	4.25	0.079	2.96	0.069
	Aug	260	4	552	2	83.6	1.1	15.3	0.21	8.64	0.19	4.20	0.048	2.86	0.048
1999	Feb	256	3	546	1	82.6	0.9	15.1	0.16	8.36	0.29	4.34	0.030	2.94	0.064
	Mar	256	3	548	4	83.4	2.1	15.2	0.26	8.56	0.48	4.26	0.058	2.90	0.043
	Aug	258	4	547	3	83.3	0.7	15.2	0.26	8.55	0.13	4.31	0.025	2.90	0.034
2000	Jan	251	2	551	4	82.7	1.4	15.2	0.10	8.48	0.13	4.43	0.056	2.93	0.032
	Mar	253	3	550	2	82.9	1.3	15.2	0.15	8.58	0.25	4.40	0.073	2.94	0.058
	Aug	255	2	551	2	81.3	0.6	15.0	0.10	8.44	0.10	4.51	0.029	2.99	0.036
2001	Jan	255	2	551	4	82.4	0.7	15.1	0.15	8.56	0.22	4.60	0.047	3.04	0.024
	Mar	253	2	549	3	82.5	0.7	15.2	0.10	8.48	0.16	4.56	0.059	3.03	0.034
	Aug	254	1	549	2	81.4	0.7	15.1	0.21	8.65	0.17	4.58	0.077	3.08	0.034
2002	Jan	253	1	550	2	80.5	0.5	15.2	0.25	8.72	0.16	4.62	0.039	3.12	0.010
	Mar	252	1	550	2	80.8	0.2	15.0	0.16	8.70	0.12	4.68	0.026	3.11	0.062
	Aug	251	1	551	1	80.8	1.1	15.1	0.19	8.79	0.22	4.60	0.061	3.12	0.048
2003	Jan	250	1	551	4	79.6	0.7	15.2	0.19	8.83	0.23	4.73	0.061	3.16	0.021
	Mar	249	2	549	2	80.6	0.5	15.2	0.14	8.79	0.25	4.69	0.052	3.18	0.028
	Aug	247	1	554	2	79.7	0.2	15.1	0.15	8.90	0.20	4.68	0.015	3.22	0.025
2004	Jan	247	2	550	2	79.3	0.4	14.9	0.08	8.82	0.23	4.71	0.058	3.26	0.027
	Mar	247	1	550	3	79.7	0.4	15.0	0.06	8.87	0.19	4.69	0.022	3.27	0.013
	Aug	246	1	548	4	79.4	0.4	14.9	0.18	8.85	0.24	4.70	0.029	3.26	0.016
2005	Jan	246	1	549	1	78.8	0.5	14.9	0.23	8.86	0.16	4.74	0.029	3.30	0.022
	Mar	246	1	549	1	79.0	0.4	15.0	0.08	8.87	0.23	4.78	0.020	3.30	0.018
	Aug	244	1	549	2	78.9	0.3	15.0	0.10	8.89	0.13	4.73	0.010	3.29	0.021
2006	Jan	244	1	548	2	78.3	0.3	15.1	0.10	8.93	0.11	4.76	0.031	3.32	0.018
	Mar	244	1	549	1	78.7	0.6	15.0	0.04	8.92	0.08	4.77	0.028	3.32	0.013
	Aug	242	1	549	3	78.1	0.5	15.0	0.18	8.92	0.13	4.75	0.069	3.33	0.020
2007	Jan	244	2	549	4	76.4	0.4	15.1	0.12	8.91	0.08	4.71	0.024	3.34	0.044
	Aug	243	2	545	2	76.1	0.6	14.8	0.25	9.02	0.11	4.65	0.038	3.35	0.030
2008	Jan	241	1	544	2	77.1	0.5	14.9	0.31	9.09	0.16	4.68	0.085	3.36	0.006
	Aug	238	2	544	3	76.4	0.2	14.9	0.10	8.96	0.08	4.56	0.032	3.37	0.014
2009	Jan	238	1	543	2	77.2	0.2	15.0	0.10	8.90	0.07	4.61	0.040	3.40	0.008
	Aug	236	1	539	1	76.3	0.3	14.9	0.12	8.96	0.17	4.51	0.028	3.37	0.023
2010	Jan	236	1	539	1	76.3	0.5	15.0	0.04	8.96	0.10	4.48	0.021	3.40	0.012
	Aug	233	1	537	1	75.4	0.3	15.0	0.19	8.96	0.09	4.42	0.013	3.43	0.014
	Dec	233	1	536	1	75.6	0.3	14.9	0.08	8.95	0.10	4.43	0.008	3.44	0.024
2011	Aug	233	2	534	1	75.0	0.3	14.9	0.09	8.97	0.16	4.36	0.016	3.51	0.021
	Dec	232	2	535	2	74.9	0.2	14.8	0.07	8.90	0.08	4.37	0.019	3.48	0.016
2012	Aug	230	1	531	1	74.3	0.4	14.8	0.05	8.95	0.14	4.24	0.042	3.46	0.039
	Dec	230	1	532	2	74.5	0.2	14.8	0.05	8.95	0.13	4.22	0.010	3.46	0.021
2013	Aug	228	1	529	1	74.2	0.4	14.8	0.00	8.84	0.04	4.14	0.020	3.50	0.020
	Dec	228	1	528	3	73.8	0.4	14.8	0.07	8.86	0.13	4.11	0.010	3.49	0.020
2014	Aug	226	2	526	2	73.8	0.2	14.8	0.06	8.91	0.14	4.03	0.030	3.51	0.020
	Dec	227	1	526	2	73.6	0.2	14.8	0.12	8.88	0.15	4.02	0.020	3.52	0.030
2015	Aug	228	2	509	4	71.1	1.9	15.7	0.17	8.21	0.11	3.72	0.220	3.45	0.080
	Dec	226	1	506	4	73.7	1.5	15.4	0.14	9.05	0.11	3.73	0.030	3.45	0.030

Note:

The figures are averages of measurement for each month (in principle, n = 6, n is the number of samples per 1 plot). For some substances, concentrations are indicated down to the three decimal places, however, they don't necessarily mean to be significant digits.

2.13 Chronological changes in Background Concentration of Specified Substances in the Atmosphere in Hokkaido (2)

Sampling period	Halon 2402		1, 1, 1-trichloroethane		Carbon tetrachloride		HCFC-22		HCFC-142b		Methyl bromide		HCFC-134a	
	Concentration	Standard deviation	Concentration	Standard deviation	Concentration	Standard deviation	Concentration	Standard deviation	Concentration	Standard deviation	Concentration	Standard deviation	Concentration	Standard deviation
1989	Jan	0.45	0.020	165.0	2	-	-	-	-	-	-	-	-	-
	Mar	0.47	0.010	166.0	4	-	-	-	-	-	-	-	-	-
	Oct	0.46	0.010	178.0	13	114.0	4.0	-	-	-	-	-	-	-
1990	Jan	0.47	0.030	176.0	6	112.0	5.0	-	-	-	-	-	-	-
	Mar	0.48	0.020	175.0	2	106.0	1.0	-	-	-	-	-	-	-
	Oct	0.50	0.020	179.0	12	111.0	4.0	-	-	-	-	-	-	-
1991	Jan	0.49	0.020	176.0	2	111.0	1.0	-	-	-	-	-	-	-
	Mar	0.48	0.020	177.0	2	108.0	1.0	-	-	-	-	-	-	-
	Aug	0.48	0.010	172.0	8	116.0	4.0	-	-	-	-	-	-	-
1992	Jan	0.51	0.020	177.0	3	113.0	3.0	-	-	-	-	-	-	-
	Mar	0.52	0.020	177.0	1	111.0	1.0	-	-	-	-	-	-	-
	Aug	0.52	0.030	177.0	4	116.0	2.0	111	2	4.50	0.70	-	-	-
1993	Jan	0.51	0.010	177.0	10	110.0	2.0	112	6	5.40	0.40	-	-	-
	Mar	0.54	-	174.0	9	113.0	4.0	114	7	5.40	0.40	-	-	-
	Aug	0.50	0.010	146.0	4	110.0	5.0	114	5	6.30	0.70	-	-	-
1994	Jan	0.52	0.023	147.0	6	105.0	2.0	120	5	7.00	0.54	-	-	-
	Mar	0.51	0.028	143.0	2	109.0	2.0	121	2	6.61	0.27	-	-	-
	Jul	0.53	0.012	144.0	11	108.0	2.0	120	3	7.45	1.10	-	-	-
1995	Jan	0.54	0.006	129.0	2	104.0	3	123	4	7.78	0.68	-	-	-
	Mar	0.53	0.015	130.0	2	105.0	3	124	2	7.68	0.38	-	-	-
	Aug	0.54	-	120.0	2	-	-	125	4	8.52	0.64	-	-	-
1996	Jan	0.54	-	112.0	1	-	-	128	3	8.94	0.96	-	-	-
	Mar	0.54	0.013	111.0	2	-	-	127	5	9.60	0.43	-	-	-
	Aug	0.53	0.013	102.0	7	104.0	1	133	5	9.94	0.86	-	-	-
1997	Jan	0.53	-	95.6	0.7	-	-	134	3	9.88	0.40	-	-	-
	Mar	0.54	-	95.4	0.4	107.0	1	133	5	10.0	1.1	-	-	-
	Aug	0.54	0.016	88.3	4.3	110.0	5	137	3	10.4	2.1	-	-	-
1998	Jan	0.53	-	78.1	1.8	106.0	4	136	2	11.2	0.59	-	-	-
	Mar	0.52	0.012	76.0	1.5	106.0	3	138	3	10.8	1.1	11.2	0.52	-
	Aug	0.53	0.029	76.5	1.5	108.0	2	142	3	11.6	0.57	11.7	0.55	-
1999	Feb	-	-	70.1	1.6	103.0	1	150	2	12.0	0.43	11.2	0.59	-
	Mar	0.53	0.036	71.5	1.6	108.0	3	150	2	12.2	0.59	10.6	0.00	-
	Aug	0.52	0.020	64.2	0.8	110.0	4	149	7	11.5	0.45	10.4	0.68	-
2000	Jan	0.53	0.018	58.7	0.7	103.0	2	150	3	13.2	0.39	9.4	0.35	-
	Mar	0.51	0.018	57.5	1.9	106.0	1	150	1	12.8	1.1	9.5	0.78	-
	Aug	0.52	0.021	50.1	1.5	108.0	1.3	153	2	13.4	0.64	10.0	0.65	17.0
2001	Jan	0.51	0.028	50.4	0.5	105.0	0.5	157	2	14.4	0.26	9.2	0.39	20.1
	Mar	0.51	0.018	50.7	0.5	105.0	1.4	158	2	14.1	0.55	10.2	0.90	19.5
	Aug	0.50	0.013	43.0	0.7	105.0	0.8	157	3	14.1	0.17	9.4	0.99	21.3
2002	Jan	0.50	0.028	37.6	0.1	104.0	0.8	158	2	15.3	0.47	9.5	0.52	24.1
	Mar	0.51	0.026	37.1	0.2	104.0	0.8	158	2	15.4	0.47	8.9	0.33	24.4
	Aug	0.50	0.027	35.7	0.6	106.0	1.0	163	2	15.2	0.59	10.0	0.56	25.8
2003	Jan	0.51	0.020	32.5	0.4	104.0	2.1	166	1	15.4	0.64	9.5	0.11	29.4
	Mar	0.50	0.012	31.8	0.8	103.0	0.4	163	1	15.9	0.58	9.5	0.28	28.9
	Aug	0.50	0.018	28.4	0.4	100.0	0.7	168	3	15.5	0.64	9.6	0.80	30.7
2004	Jan	0.50	0.004	26.6	0.3	99.5	0.8	168	1	15.9	0.44	10.3	0.62	32.3
	Mar	0.50	0.024	26.6	0.4	99.3	0.8	169	1	16.5	0.32	9.6	0.51	33.1
	Aug	0.49	0.013	23.8	0.6	99.0	0.7	171	2	16.6	0.18	9.4	0.39	34.8
2005	Jan	0.50	0.008	21.9	0.3	98.0	0.7	174	2	16.4	0.08	9.4	0.38	36.9
	Mar	0.50	0.008	21.9	0.9	99.4	0.7	174	1	16.6	0.20	9.8	0.29	37.5
	Aug	0.49	0.010	20.8	0.3	97.5	0.7	179	3	17.1	0.26	10.2	0.45	40.0
2006	Jan	0.49	0.019	19.2	0.2	96.7	0.4	179	2	17.4	0.23	9.1	0.15	41.8
	Mar	0.50	0.021	18.6	0.3	96.0	1.1	183	1	17.2	0.26	9.5	0.21	43.5
	Aug	0.48	0.006	16.2	0.4	97.0	0.6	186	2	17.6	0.35	9.5	0.17	44.8
2007	Jan	0.48	0.021	16.2	0.1	96.5	0.4	190	2	18.4	0.18	9.4	0.42	46.8
	Mar	0.48	0.008	14.4	0.2	96.0	0.8	200	2	20.3	0.46	9.8	0.69	50.5
	Aug	0.46	0.014	14.5	0.3	95.6	0.6	198	3	19.7	0.23	9.4	0.49	51.8
2008	Jan	0.48	0.008	11.6	0.1	93.4	0.6	203	4	20.2	0.67	8.7	0.71	54.4
	Mar	0.48	0.005	11.6	0.1	92.9	0.4	204	4	21.1	0.18	8.7	0.34	56.9
	Aug	0.47	0.004	10.4	0.2	93.0	1.2	205	1	20.7	0.49	8.9	0.87	57.4
2009	Jan	0.47	0.012	9.6	0.2	91.7	0.6	206	1	21.4	0.32	8.3	0.17	59.7
	Mar	0.47	0.012	8.5	0.2	90.8	0.5	212	1	22.4	0.38	9.1	0.34	65.0
	Dec	0.47	0.008	8.2	0.1	90.6	0.8	220	2	22.6	0.37	8.4	0.31	66.2
2010	Jan	0.46	0.005	6.8	0.2	90.3	0.7	236	2	23.2	0.71	10.8	0.83	71.2
	Mar	0.46	0.006	6.7	0.1	89.6	0.2	224	2	23.6	0.34	8.5	0.15	72.7
	Aug	0.46	0.004	5.6	0.1	88.8	0.4	226	8	23.7	0.77	10.7	0.46	74.0
2011	Jan	0.45	0.005	5.5	0.1	88.9	1.0	229	2	23.6	0.21	8.6	0.26	76.4
	Mar	0.45	0.010	4.8	0.1	88.7	0.9	233	2	24.2	0.20	9.3	0.30	78.8
	Aug	0.45	0.010	4.6	0.1	88.6	0.5	234	2	24.2	0.30	8.2	0.10	81.9
2012	Jan	0.45	0.010	4.0	0.1	87.7	0.5	244	3	24.4	0.30	9.0	0.20	87.2
	Mar	0.45	0.010	3.8	0.1	87.3	0.8	236	1	24.4	0.40	7.7	0.20	89.5
	Aug	0.30	0.010	2.9	0.2	74.6	2.2	251	10	23.2	0.60	11.2	2.10	89.6
2013	Jan	0.31	0.010	2.9	0.1	81.9	2.0	247	3	23.0	0.30	8.0	0.30	89.9
	Mar	0.31	0.010	2.9	0.1	81.9	2.0	247	3	23.0	0.30	8.0	0.30	89.9
	Aug	0.31	0.010	2.9	0.1	81.9	2.0	247	3	23.0	0.30	8.0	0.30	89.9

Source: "The Annual Report of Result of Ozone Monitoring in 2015," Ministry of the Environment

2.14 Changes in annual average of total ozone amount over Japan

(Unit: m atm - cm)

	Sapporo	Tsukuba	Kagoshima	Naha
1958	361	327	306	—
1959	374	317	290	—
1960	384	320	310	—
1961	363	316	—	—
1962	372	321	—	—
1963	373	321	290	—
1964	373	312	275	—
1965	371	317	284	—
1966	375	314	281	—
1967	359	307	280	—
1968	359	319	295	—
1969	362	308	288	—
1970	370	318	282	—
1971	366	313	275	—
1972	348	310	284	—
1973	363	313	281	—
1974	354	310	281	266
1975	351	315	285	259
1976	352	298	278	261
1977	365	309	278	263
1978	357	309	272	256
1979	361	314	286	269
1980	368	313	280	264
1981	368	318	280	267
1982	369	318	284	270
1983	361	312	276	264
1984	368	316	281	263
1985	353	298	268	257
1986	360	314	279	264
1987	364	310	286	262
1988	362	308	283	253
1989	352	308	289	265
1990	346	311	287	266
1991	355	313	288	267
1992	342	309	288	263
1993	334	298	276	255
1994	343	311	290	263
1995	345	307	285	258
1996	350	306	284	265
1997	342	301	281	262
1998	352	310	287	267
1999	354	308	283	261
2000	348	309	285	269
2001	357	312	288	268
2002	350	308	280	266
2003	352	314	283	272
2004	349	303	282	270
2005	358	316	—	271
2006	357	316	—	269
2007	357	315	—	274
2008	348	309	—	267
2009	355	311	—	269
2010	362	319	—	272
2011	354	311	—	271
2012	353	309	—	271
2013	357	311	—	271
2014	355	315	—	274
2015	360	315	—	269
2016	351	303	—	262

Source: "Ozone Layer and Ultraviolet Radiation" by Japan Meteorological Agency

2.15 Changes in ozone hole area in the Antarctic

(Unit : 10,000 km²)

	Area
1979	110
1980	330
1981	310
1982	1,080
1983	1,220
1984	1,460
1985	1,880
1986	1,440
1987	2,240
1988	1,370
1989	2,170
1990	2,100
1991	2,250
1992	2,490
1993	2,570
1994	2,510
1995	2,280
1996	2,670
1997	2,500
1998	2,780
1999	2,560
2000	2,960
2001	2,630
2002	2,170
2003	2,830
2004	2,270
2005	2,670
2006	2,930
2007	2,490
2008	2,650
2009	2,400
2010	2,190
2011	2,550
2012	2,080
2013	2,340
2014	2,340
2015	2,780
2016	2,270

Source: "Ozone Layer and Ultraviolet Radiation" by Japan Meteorological Agency

2.16 Recovery and Destruction of Fluorocarbons

			CFC	HCFC	HFC	Total		
Commercial equipment for refrigeration and air conditioning	Number of collected equipment	2005	138,927	638,013	127,749	904,689		
		2006	115,157	597,874	165,399	878,430		
		2007	104,096	667,412	261,127	1,032,635		
		2008	104,130	685,974	447,374	1,237,478		
		2009	84,141	593,761	494,489	1,172,391		
		2010	72,615	571,284	520,259	1,164,158		
		2011	62,944	538,777	628,339	1,230,060		
		2012	55,178	514,037	730,014	1,299,229		
		2013	64,469	497,208	806,291	1,367,968		
		2014	58,864	456,750	878,429	1,394,043		
		2015	52,704	503,027	982,296	1,538,027		
	Amount recovered (ton)	2005	292	1,823	183	2,298		
		2006	348	1,987	206	2,541		
		2007	342	2,404	422	3,168		
		2008	290	2,814	669	3,773		
		2009	207	2,661	733	3,601		
		2010	216	2,862	817	3,895		
		2011	185	2,850	922	3,958		
		2012	211	3,140	1,193	4,543		
		2013	175	2,917	1,371	4,463		
		2014	150	2,847	1,427	4,424		
		2015	165	3,169	1,507	4,841		
	Recycled	2005	82	310	42	434		
		2006	63	325	34	422		
		2007	126	493	111	729		
		2008	90	511	135	736		
		2009	73	599	151	824		
		2010	65	672	166	903		
		2011	69	719	209	996		
		2012	75	739	271	1,084		
		2013	45	790	341	1,176		
		2014	50	877	389	1,316		
		2015	60	1,178	436	1,674		
Car air conditioners	Automobile Recycling Act	2005	342	—	441	783		
		2006	320	—	608	928		
		2007	256	—	724	980		
		2008	193	—	821	1,014		
		2009	164	—	977	1,141		
		2010	70	—	845	915		
		2011	34	—	640	673		
		2012	26	—	781	807		
		2013	19	—	792	811		
		2014	14	—	773	787		
		2015	10	—	710	720		
	Recycled	2005	17	—	15	32		
		2006	10	—	12	22		
		2007	9	—	14	22		
		2008	6	—	11	17		
		2009	5	—	12	17		
		2010	4	—	12	16		
		2011	2	—	13	15		
		2012	1	—	10	11		
		2013	1	—	11	12		
		2014	2	—	13	15		
		2015	1	—	9	10		
		Law Concerning the Recovery and Destruction of Fluorocarbons	Car air-conditioners collected (units)	2005	45	—	53	98
				2006	9,310	—	16,105	25,415
2007	26			—	90	116		
2008	26			—	90	116		
2009	6			—	40	46		
2010	2			—	7	9		
2011	3			—	3	6		
2012	2			—	10	12		
2013	0			—	1	1		
2014	0			—	0	0		
2015	0			—	5	5		
Amount recovered (tons)	2005		12	—	16	28		
	2006		2.92	—	5.91	8.83		
	2007		0.01	—	0.03	0.04		
	2008		0.008	—	0.029	0.038		
	2009		0.004	—	0.007	0.011		
	2010		0.003	—	0.006	0.008		
	2011		0.002	—	0.002	0.004		
	2012		0.001	—	0.005	0.006		
Amount of destruction (ton)	2013	—	—	0.001	0.001			
	2014	—	—	—	—			
	2015	0.000	—	0.012	0.012			
	2005	556	1,623	608	2,788			
	2006	590	1,821	772	3,183			
	2007	479	2,095	1,036	3,611			
	2008	376	2,439	1,346	4,161			
	2009	271	2,164	1,505	3,941			
	2010	271	2,284	1,596	4,152			
	2011	226	2,362	1,528	4,116			
	2012	218	2,393	1,829	4,440			

Notes:

1) Because of rounding fractions, the figures in "Total" column may not be consistent with the sums of each figure.

2) Collection of car air conditioners has been transferred to control of the Automobile Recycling Law since January 2005. However, as for the specific second-class products handed over to the second-class Fluorocarbons collectors by December 31, 2004, those products collected under transitional measures are included in "Law concerning the Recovery and Destruction of Fluorocarbons."

Sources: Materials by Ministry of the Environment and Ministry of Economy, Trade and Industry, and Japan Automobile Recycling Promotion Center

2.17 Japan's contribution to the Montreal Protocol Multilateral Fund

(Unit: million dollars)

Period	Total contributions (including carryover)	Japan's contribution
First period 1991 - 1993	240	33
Second period 1994 - 1996	510	65
Third period 1997 - 1999	540	85
Fourth period 2000- 2002	476	99
Fifth period 2003 - 2005	573	104
Sixth period 2006 - 2008	470	88
Seventh period 2009 - 2010	490	81
Eighth period 2012 - 2014	450	64
Ninth period 2015 - 2017	508	66

Source: Material by Ministry of Foreign Affairs

2.18 Trends in emissions of sulfur dioxide (SO_x) by country

(Unit : 1,000 t)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Japan	1,082	1,075	1,050	1,017	969	920	881	811	782	733	692	691	695	689
Australia	2,537	2,702	2,693	2,440	2,520	2,412	2,443	2,622	2,601	2,380	2,355	2,341	2,309	2,287
Austria	33	32	32	27	26	27	24	22	16	18	17	16	16	16
Belgium	166	157	152	154	141	132	123	95	73	59	52	47	44	42
Canada	2,396	2,344	2,292	2,263	2,193	1,999	1,938	1,752	1,481	1,373	1,278	1,242	1,206	1,142
Czech Republic	224	220	216	212	208	203	209	169	166	160	161	155	138	127
Denmark	30	28	35	29	26	30	27	21	16	16	14	13	13	11
Finland	90	89	102	84	69	84	82	68	59	67	61	51	48	44
France	563	522	509	484	467	438	423	356	306	286	250	236	218	170
Germany	626	563	536	497	474	476	460	460	411	432	428	413	410	388
Greece	508	517	556	552	541	534	537	444	423	248	190	151	141	138
Hungary	347	273	246	149	41	39	35	35	30	31	34	31	29	27
Iceland	39	41	37	32	39	44	58	74	69	74	73	84	71	65
Ireland	137	104	81	74	74	63	57	47	34	28	27	25	25	19
Italy	702	622	525	486	408	385	343	288	236	217	195	177	145	131
South Korea	488	474	469	447	408	446	403	418	388	402	434	418	...	...
Luxembourg	4	3	3	2	2	3	2	2	2	2	1	2	2	2
Mexico	...	...	...	...	3,102	...	...	2,241	...	...	...	...	...	...
Netherlands	73	66	62	64	63	63	59	50	37	33	33	34	29	29
New Zealand	75	77	91	87	94	90	82	88	74	74	74	78	75	74
Norway	25	23	23	25	24	21	20	20	16	20	19	17	17	17
Poland	1,436	1,331	1,287	1,249	1,217	1,292	1,229	1,007	868	937	885	859	847	800
Portugal	249	249	190	192	194	169	162	113	78	70	64	58	53	47
Slovakia	131	103	105	96	89	88	71	69	64	69	68	58	53	45
Spain	1,446	1,572	1,307	1,334	1,279	1,162	1,126	504	453	422	458	405	259	255
Sweden	41	41	42	37	36	36	33	31	30	32	29	28	27	24
Switzerland	18	15	15	15	15	14	12	12	10	10	9	9	9	8
Turkey	2,075	1,965	1,888	1,881	2,106	2,270	2,648	2,562	2,666	2,560	2,640	2,716	1,931	2,148
UK	1,135	1,014	991	834	711	670	589	491	400	423	392	439	386	307
USA	14,413	13,564	13,361	13,146	13,145	11,854	10,563	9,302	8,182	6,951	5,791	4,624	4,538	4,441

Source: OECD Stat, Environment, Air and Climate

2.19 Trends in emissions of nitrogen oxide (NOx) by country

(Unit : 1,000 t)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Japan	1,987	2,038	2,020	1,952	1,928	1,844	1,736	1,600	1,518	1,460	1,395	1,350	1,310	1,276
Canada	1,957	2,029	2,111	2,160	2,187	2,187	2,212	2,259	2,263	2,389	2,297	2,453	2,531	2,549
Mexico	219	224	234	231	233	219	210	193	177	177	167	161	160	149
USA	2,688	2,644	2,637	2,506	2,450	2,351	2,341	2,259	2,086	2,162	2,106	1,989	1,938	1,923
South Korea	330	319	317	328	313	294	281	265	238	245	227	209	201	192
Australia	339	328	328	326	319	312	309	292	271	261	247	234	222	211
New Zealand	222	218	227	211	202	202	189	171	151	146	138	127	122	112
Austria	231	229	238	226	198	214	203	186	167	177	162	153	149	140
Belgium	1,576	1,544	1,506	1,473	1,427	1,353	1,287	1,186	1,105	1,085	1,022	984	963	883
Czech Republic	1,849	1,771	1,715	1,649	1,573	1,557	1,486	1,412	1,312	1,337	1,316	1,274	1,271	1,223
Denmark	386	387	397	403	419	417	418	396	383	324	302	242	249	248
Finland	209	216	207	204	169	172	167	164	157	154	140	124	121	120
France	26	28	27	28	26	26	27	25	25	23	21	21	21	20
Germany	140	133	131	134	136	132	129	116	93	85	76	78	77	76
Greece	1,432	1,377	1,357	1,310	1,254	1,191	1,144	1,073	999	984	956	872	820	795
Hungary	1,219	1,242	1,362	1,378	1,307	1,275	1,188	1,045	1,014	1,061	1,040	1,075	...	...
Iceland	26	28	27	28	26	26	27	25	25	23	21	21	21	20
Ireland	...	...	...	...	2,784	...	...	3,207	...	...	...	...	...	...
Italy	386	375	371	358	348	339	323	314	286	281	267	251	240	215
Luxembourg	44	44	48	56	59	54	49	45	39	39	39	35	32	28
Netherlands	203	197	197	198	198	195	198	187	177	179	172	165	153	142
Norway	839	806	828	855	851	856	861	829	809	861	843	819	798	723
Poland	272	279	255	261	266	245	239	213	202	187	178	167	167	164
Portugal	108	100	98	99	102	96	96	94	84	89	85	81	80	85
Slovakia	1,370	1,411	1,410	1,448	1,435	1,380	1,373	1,185	1,048	971	964	931	824	807
Spain	206	198	194	189	184	180	173	166	154	158	149	142	139	136
Sweden	104	97	95	94	93	90	87	85	79	77	72	72	72	67
Switzerland	819	797	823	839	887	930	1,042	994	971	943	1,118	1,090	1,044	1,051
Turkey	1,804	1,700	1,672	1,623	1,614	1,562	1,493	1,345	1,164	1,142	1,059	1,081	1,032	945
UK	19,393	21,632	20,445	19,248	18,380	17,357	16,334	15,252	14,220	13,381	13,004	12,222	11,691	11,092

Source: OECD Stat, Environment, Air and Climate

2.20 Acid deposition in Europe (Annual average of pH in precipitation)

(Unit: pH)

Country	Station name	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Iceland	Irafoss	5.41	5.38	5.55	5.58	5.59	5.41	5.44	5.50	5.50	5.36	5.33	5.48	—	—
Ireland	Valentia	5.38	5.20	5.04	—	5.37	5.13	5.27	5.25	5.30	5.30	5.36	5.28	5.32	5.30
Italy	Montelibretti	5.09	—	4.83	4.60	5.84	5.20	5.62	5.21	5.56	5.92	—	6.02	5.87	6.17
UK	Yarner Wood	—	4.88	4.84	—	4.81	4.84	4.96	4.90	4.99	5.11	5.12	5.04	5.07	5.18
Austria	Illmitz	4.38	4.50	5.06	5.30	4.96	4.92	5.09	5.85	5.47	—	—	—	—	—
Netherlands	Kollumerwaard	—	—	5.14	5.25	5.29	—	5.39	5.53	5.48	5.54	—	—	—	—
Switzerland	Payerne	4.77	4.93	5.10	5.37	5.37	5.48	5.43	5.42	5.40	5.37	5.67	5.59	5.64	5.68
Sweden	Vavihill	4.29	4.41	4.46	4.56	4.80	4.87	4.96	4.83	4.98	4.91	5.16	4.88	4.91	5.09
	Bredkalen	4.47	4.60	4.81	4.81	5.03	5.06	5.09	5.04	5.04	—	—	—	5.06	5.10
Spain	Niembro	—	—	—	4.89	4.23	4.69	5.10	4.91	5.07	3.09	4.88	4.57	4.61	4.70
Slovakia	Chopok	4.27	4.27	4.67	4.55	4.85	4.75	4.93	4.93	4.83	5.00	5.04	4.74	4.99	5.10
Czech Republic	Svratouch	4.46	4.34	4.54	4.75	4.73	4.80	4.92	4.93	4.73	4.94	5.10	4.89	4.92	5.16
	Kosetice	—	4.36	4.47	4.68	4.84	4.79	4.91	4.92	4.88	4.91	5.33	5.22	5.01	5.24
Denmark	Keldsnor	4.32	4.66	4.62	4.85	4.94	5.33	5.08	5.11	4.96	—	—	—	—	—
Germany	Deuselbach	4.37	4.64	4.76	4.82	4.83	4.98	4.87	5.24	5.12	5.11	5.10	5.45	5.17	—
	Zingst	—	—	4.59	—	4.75	4.93	4.93	4.92	5.02	—	5.25	5.33	5.25	5.33
Norway	Birkenes	4.24	4.37	4.48	4.56	4.68	4.70	4.75	4.77	4.72	4.69	4.86	4.86	4.97	4.77
	Skreadalen	4.48	4.61	4.75	4.90	5.20	—	—	—	—	—	—	—	—	—
Hungary	K-Pusztá	5.08	4.99	4.83	5.79	5.67	5.58	5.53	5.75	5.50	5.63	5.82	5.77	5.66	5.66
Finland	Ahtari	4.55	4.57	4.61	4.73	4.78	4.72	4.79	4.79	4.79	4.87	4.88	4.86	4.86	4.79
France	La Hague	4.41	4.68	5.05	5.04	—	—	—	—	—	—	—	—	—	—
Poland	Jarczew	4.16	4.33	4.43	4.61	4.63	4.71	4.71	4.85	5.05	4.98	4.90	4.93	4.82	4.87
Portugal	Braganca	5.12	5.41	5.92	5.52	5.76	5.78	5.79	5.35	5.50	—	—	—	—	—

Note:

Skreadalen, La Hague and Braganca stations suspended their operations in February 2005, December 2003, and December 2009 respectively.

Source : "CCC-Report(2/2160)," EMEP (http://www.emep.int/pub/common_publications.html)

2.21 Acid Deposition in Japan (Annual Average of pH in Precipitation)

(Unit: pH)

Monitoring site	2008	2009	2010	2011	2012	2013	2014	2015
Rishiri	4.94	4.67	4.75	4.67	4.70	4.69	4.76	4.77
Sapporo	4.62	4.87	4.86	4.76	4.69	4.65	4.73	4.77
Tappimisaki	4.89	4.72	4.68	4.61	4.72	4.71	4.72	4.84
Obanazawa	4.73	—	—	—	—	—	—	—
Sado seki misaki	4.59	4.72	4.70	4.66	4.75	4.70	4.72	4.73
Niigata maki	4.57	4.63	4.68	4.60	4.62	4.65	4.67	4.65
Echizenmisaki	4.62	4.58	4.59	4.63	4.57	4.60	4.64	4.68
Happo one	4.88	5.03	5.07	5.04	4.93	5.00	5.02	5.06
Oki	4.63	4.67	4.66	4.68	4.66	4.61	4.67	4.75
Banryuko	4.52	4.70	4.69	4.58	4.51	4.63	4.59	4.65
Ochiishimisaki	4.89	5.01	4.81	4.87	4.83	5.00	5.19	5.02
Hachimantai	4.77	4.92	4.94	4.86	4.73	4.83	—	—
Nonodake	4.76	4.81	4.95	5.02	4.93	4.98	5.05	4.90
Tsukuba	4.85	—	—	—	—	—	—	—
Akagi	4.82	4.76	4.82	4.84	4.74	4.85	4.85	4.75
Ogasawara	5.06	5.18	5.22	5.34	5.37	5.22	5.07	5.20
Kawasaki	—	—	—	—	—	—	—	—
Tokyo	4.62	4.76	4.95	4.79	4.88	5.03	4.83	4.81
Ijirako	4.78	4.65	4.78	4.72	4.70	4.74	4.70	4.74
Inuyama	4.58	—	—	—	—	—	—	—
Nagoya	—	—	—	—	—	—	—	—
Ushiomisaki	4.76	4.80	4.86	4.81	4.76	4.81	—	—
Yusuhara	4.68	4.78	4.83	4.87	4.83	4.77	4.93	4.85
Ebino	4.83	4.61	4.72	4.71	4.67	4.73	4.70	4.97
Kyotoyawata	4.64	4.68	4.73	4.73	4.66	4.77	—	—
Osaka	—	—	—	—	—	—	—	—
Amagasaki	4.63	4.74	4.84	4.84	4.71	4.79	4.65	4.81
Kurahashijima	4.54	—	—	—	—	—	—	—
Oitakujyu	4.69	4.66	4.66	4.66	4.69	4.66	4.40	4.74
Chikugoogoori	4.76	4.74	4.80	4.67	4.65	4.66	4.69	4.84
Omuta	—	—	—	—	—	—	—	—
Tsushima	4.49	4.53	4.77	4.65	4.66	4.75	4.72	4.81
Goto	4.67	—	—	—	—	—	—	—
Yakushima	4.65	4.50	4.66	4.56	4.68	4.59	4.59	4.71
Hedomisaki	5.07	5.03	5.21	4.91	5.12	4.93	5.14	5.11
Maximum	5.07	5.18	5.22	5.34	5.37	5.22	5.19	5.20
Minimum	4.48	4.50	4.59	4.56	4.51	4.59	4.40	4.65
Average	4.71	4.76	4.82	4.77	4.76	4.78	4.78	4.83
Standard deviation	0.15	0.17	0.16	0.17	0.18	0.16	0.20	0.15

Notes:

- - : Not measured.
- Data of the shaded area: Rejected annual average by the year criterion.

Source: Transboundary air pollutions and acid deposition monitoring Report (2015) , Ministry of the Environment

2.22 Annual average pH at monitoring sites of East Asia acid deposition monitoring network (EANET)

(Unit: pH)

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cambodia	Phnom Penh	—	5.32	6.32	6.72	6.69	5.84	6.19	5.97	5.96	6.16	6.18	6.21	6.17
	Han Cisne	6.00	6.30	5.41	5.56	5.52	6.40	6.53	6.68	6.27	6.26	6.93	6.61	6.57
	Xian	6.11	5.98	5.15	5.84	—	—	—	—	—	—	—	—	—
	Vishuiyan	6.05	6.11	6.20	5.87	6.85	6.94	6.10	5.54	5.95	7.12	6.20	6.98	6.57
	Jiwozi	4.49	4.59	4.95	4.86	4.65	—	—	—	—	—	—	—	—
	Guaninchao	4.30	4.59	4.62	4.69	4.52	4.36	4.33	3.94	4.04	4.09	4.20	4.39	4.31
	Jinyunshan	4.46	4.71	4.70	4.83	4.79	4.59	4.52	4.57	4.65	4.51	4.88	5.08	4.81
	Xiamen	4.38	4.61	4.78	4.78	4.60	4.55	4.47	4.58	4.82	4.80	5.00	4.71	4.87
	Xiaoping	5.10	4.78	4.56	4.87	4.63	4.93	4.87	4.85	5.05	5.11	5.23	5.00	5.18
	Zhuhai	5.10	4.63	4.61	4.82	—	4.88	4.75	4.95	4.78	—	—	—	5.48
	Zhuxiandong	5.30	4.67	4.68	4.53	5.27	5.22	4.65	4.80	5.04	5.01	4.97	4.82	4.92
	Kototabang	5.16	4.69	4.31	4.38	4.56	4.65	4.63	4.73	4.55	4.76	4.77	4.71	4.77
	Jakarta	4.62	4.68	4.59	4.60	4.59	4.62	4.71	4.76	4.70	4.91	5.06	5.14	5.04
	Serpong	5.00	5.03	5.03	5.15	4.93	5.17	5.30	5.10	5.40	5.46	5.40	5.21	5.35
	Bandung	—	—	—	—	—	5.63	5.33	5.21	5.35	5.62	5.47	5.23	5.37
	Maros	4.88	4.84	4.74	4.67	4.58	4.91	4.74	4.73	4.70	4.70	4.67	4.73	4.72
	Rishiri	4.57	4.59	4.60	4.58	4.62	4.59	4.74	4.69	4.61	4.69	4.80	4.66	4.74
	Tappimisaki	5.04	5.13	4.81	4.99	5.03	5.00	5.17	5.25	5.30	5.33	5.25	5.08	5.21
	Ogasawara	4.67	4.70	4.56	4.70	4.50	4.55	4.75	4.70	4.68	4.73	4.74	4.70	4.71
	Sadozekimisaki	4.91	4.86	4.80	4.97	4.79	4.83	4.97	5.10	5.04	4.88	5.00	5.01	4.96
	Happo one	4.41	4.65	4.51	4.51	4.53	4.45	4.64	4.76	4.75	4.69	4.75	4.71	4.71
	Iijirako	4.76	4.80	4.56	4.73	4.64	4.60	4.71	4.66	4.73	4.58	4.61	4.65	4.63
	Oki	4.63	4.70	4.49	4.69	4.49	4.53	4.66	4.70	4.66	4.48	4.64	4.55	4.59
	Banryuko	4.73	4.97	4.64	4.84	4.81	4.67	4.77	4.79	4.93	4.77	4.78	4.88	4.81
	Yusuhara	4.90	4.78	4.83	4.99	4.99	5.00	5.11	5.20	4.90	5.13	4.96	5.02	5.04
	Hedomisaki	4.91	4.68	4.84	4.86	4.78	4.87	5.02	4.83	4.88	4.82	5.03	—	5.03
	Ochiishimisaki	—	—	—	—	4.79	4.60	4.75	4.95	4.83	4.84	5.05	4.83	4.87
	Tokyo	6.51	5.65	6.32	6.49	5.67	6.01	5.48	—	—	6.46	—	6.54	6.19
	Vientiane	4.90	4.86	4.84	4.95	4.95	5.10	5.08	5.06	5.01	4.96	4.95	4.86	4.86
	Tanarata	4.28	4.33	4.37	4.42	4.56	4.43	4.35	4.26	4.16	4.21	4.42	4.42	4.35
	Petaling Jaya	—	—	4.98	5.05	5.10	5.22	5.22	5.22	5.21	5.18	5.27	5.31	5.24
	Danang Valley	—	—	—	—	—	5.26	5.26	5.28	5.43	5.32	5.29	5.34	5.31
	Kuching	5.72	6.46	5.99	6.45	6.26	6.28	6.11	5.88	5.44	5.88	5.98	—	6.03
	Ulan Bator	5.40	5.78	5.26	5.16	5.22	5.43	6.22	5.61	5.26	5.74	4.91	—	5.27
	Tereruji	—	—	—	—	5.57	6.41	6.46	6.42	6.46	6.49	6.45	6.70	6.57
	Yangon	4.44	5.18	4.95	5.30	5.27	5.55	5.23	5.65	5.64	5.22	5.55	6.13	5.81
	Metro Manila	4.49	5.26	5.14	5.61	5.54	4.95	5.58	5.88	5.57	5.66	5.85	—	6.29
	Los Banos	—	—	—	6.32	5.53	5.49	5.83	6.70	5.35	5.95	5.29	6.14	5.71
	Mt. Sto. Tomas	4.67	4.57	4.25	4.68	4.62	4.55	4.59	4.41	—	4.61	4.58	4.87	4.65
	Kanghwa	5.08	4.93	6.00	5.19	5.73	4.88	5.09	4.87	—	5.11	5.22	5.29	5.17
	Imsil	4.83	4.74	4.55	4.34	4.51	4.67	5.11	5.04	—	5.31	5.38	5.79	5.52
	Cheju	5.35	5.34	5.36	5.39	5.52	5.17	5.48	5.55	5.54	5.62	5.32	5.33	5.38
	Mondy	5.37	4.91	5.12	5.15	4.93	4.77	5.41	5.13	5.02	4.93	5.01	5.06	5.03
	Irkutsk	5.01	4.92	4.83	4.64	4.67	4.63	4.84	4.76	4.73	4.78	4.80	4.90	4.82
	Listvyanka	4.88	4.84	5.06	4.83	4.84	4.79	4.98	4.97	4.63	5.07	5.06	5.47	5.15
	Primorskaya	5.61	5.59	5.23	5.70	5.95	5.98	5.92	6.17	5.29	6.10	6.04	6.28	6.16
	Chiang Mai (Mae Hia)	5.46	6.07	5.54	5.75	5.78	5.66	5.66	5.69	5.49	6.02	5.33	5.79	5.61
	Kanchanaburi	4.53	5.19	4.89	5.16	5.05	5.28	5.09	5.07	5.05	5.68	5.60	7.03	5.57
	Bangkok	—	5.47	5.47	5.87	5.61	5.29	5.13	5.32	5.90	6.17	5.98	6.51	5.89
	Samut Prakan	4.86	4.87	4.89	4.89	4.81	5.03	5.15	5.24	5.00	5.44	5.41	5.51	5.41
	Pathum Thani	—	—	—	5.12	5.08	5.03	4.87	4.75	5.00	5.07	5.24	4.82	5.09
	Nakhon Ratchasima	5.81	5.65	6.15	5.73	5.58	5.84	5.67	5.93	5.30	5.62	5.66	5.74	5.73
	Hanoi	5.38	5.60	5.69	5.59	5.06	5.49	5.29	5.37	5.44	5.63	6.04	5.44	5.55
	Hua Hin	—	—	—	—	—	—	4.99	5.23	5.04	5.43	5.42	5.52	5.42
	Cuc Phuong	—	—	—	—	—	—	—	—	—	—	—	—	—
	Da Nang	—	—	—	—	—	—	—	4.77	5.11	4.98	5.44	5.58	5.59

Note:

• Data of the shaded area: Rejected annual average was by the year criterion.

Source: Data Report on the Acid Deposition in the East Asian Region(2000~2005)

Data Report on the Acid Deposition in the East Asian Region(2006~2015)

2.23 Water quality in rivers

(Unit: mg-O₂/L)

(Unit: mg-O ₂ /L)									
Country (region)	River	Biochemical oxygen demand (BOD)							
		1985	1990	1995	2000	2005	2010	2012	2013
Asia									
Japan	Ishikarigawa	1.5	1.2	1.3	1.0	0.9	...	...	...
	Chikugogawa	2.2	1.7	1.5	1.5	1.4	...	...	...
	Tonegawa	2.6	2.3	1.9	1.7	1.6	...	...	...
	Yodogawa	3.4	2.5	2.3	1.5	1.3	...	...	...
South Korea	Geumgang	...	...	4.5	3.5	...	...	...	...
	Nakutongan	...	3.0	5.1	2.7	2.6	2.4	2.4	2.3
	Hangang	...	3.4	3.8	2.7	3.1	3.2	2.6	2.1
	Yonsangan	...	6.7	7.0	6.5	5.3	4.3	4.6	3.7
Turkey	Gediz River	2.3	10.6	...	3.7	...	...	...	...
	Sakarya River	3.6	2.7	4.1	3.1	...	...	...	...
	Porsuk River	2.0	1.1	1.6	1.1	...	...	...	...
North America									
USA	Delaware River	2.1	1.2	2.6	3.7	3.2	...	...	...
	Mississippi River	1.2	1.9	1.1	1.5	1.9	...	...	...
Mexico	Grijalva River	1.5	2.2	2.0	1.8	2.2	4.3	16.6	8.7
	Bravo River	2.5	3.6	3.1	2.2	...	8.3	8.9	5.3
	Lerma River	...	13.5	...	30.0	4.2	10.6	5.9	11.3
Europe									
Ireland	River Clare	...	...	...	1.5	0.6	0.6	0.8	...
	River Barrow	...	...	...	1.5	1.4	1.2	1.8	...
	River Blackwater	...	...	...	2.0	2.1	1.4	1.6	...
	River Boyne	...	...	...	2.1	1.5	1.7	2.3	...
UK	Clyde River	3.2	3.5	2.9	2.3	...	...	...	...
	Severn River	1.7	2.8	2.4	...	...	...	...	...
	Thames River	2.4	2.9	1.8	1.7	...	...	...	...
Austria	Inn River	...	...	2.8	0.8	0.6	0.8	1.2	...
	Danube River	...	...	2.1	0.4	0.4	0.6	0.6	...
Netherlands	Meuse River (Maas)	2.9	1.6	2.0	2.2	...	...	...	...
	Rhein River	2.3	1.6	1.9	...	...	...	...	...
Spain	Ebro River	...	4.0	9.2	8.1	2.3	...	...	...
	Guadalquivir River	...	9.8	77.1	5.9	3.9	...	...	...
	Douro River	...	3.0	5.4	3.1	2.5	...	...	...
Czech Republic	Oder River	10.1	5.9	7.1	5.8	4.3	3.5	...	...
	Morava River	...	...	4.6	3.0	3.0	...	...	...
	Rabe River	6.6	6.8	3.7	3.9	2.9	2.8	...	...
Denmark	Gudena River	2.5	2.0	2.4	1.9	1.5	1.2	...	...
	Sukyan River	5.5	2.3	...	1.2	0.8	1.0	...	...
Germany	Danube River	...	...	...	...	1.7	1.6	1.6	...
Hungary	Tisza River	...	3.3	3.8	2.5	3.0	...	...	...
	Danube River	...	3.8	3.1	2.7	3.1	...	...	...
	Doraba River	...	3.4	3.3	2.9	2.1	...	...	...
France	Seine River	4.3	5.6	4.4	3.2	...	1.1	...	...
	Rhone River	5.0	1.4	1.3	2.0	...	1.0	...	...
	Loire River	6.0	7.0	4.0	4.3	...	1.7	...	...
Belgium	Schelde River	...	...	5.2	7.0	6.2	...	2.8	...
	Meuse River (Maas River)	...	...	1.6	2.2	1.0	1.0	1.0	1.0
Poland	Oder River	...	...	...	5.2	5.5	3.1	3.5	...
	Vistula River	...	...	...	4.7	4.3	2.9	4.1	...
Luxemburg	Syre River	...	...	2.7	3.2	1.2	1.9	1.5	...
	Moselle River	...	...	...	...	...	2.5	...	...

Notes:

- Rivers: Measurement was conducted at the estuary of major rivers with large basin areas, or downstream points of within the borders.
- Biochemical oxygen demand (BOD): An index showing to which extent river water is polluted, indicating the oxygen amounts needed for decomposing organic matter by microorganisms (bacteria) in water. The higher annual average value is, the further pollution is indicated. Each country or region uses a different measuring method.

Source: OECD. Stat, Environment, Air and Climate

2.24 Water quality in lakes

Country (region)	Lakes and marshes	Total phosphorus (mgP/l)				Total nitrogen (mgN/l)			
		1990	2000	2012	2013	1990	2000	2012	2013
Asia									
Japan	Kasumigaura	0.050	0.110	...	...	0.93	0.97	...	...
	Biwako (North)	0.007	0.006	...	...	0.29	0.29	...	...
	Biwako (South)	0.020	0.020	...	...	0.38	0.39	...	...
South Korea	Lake Chungju	0.044	0.025	0.023	0.021	0.62	2.27	3.04	2.48
	Chuncheon Lake	0.014	0.015	0.020	0.017	0.60	1.43	2.02	1.51
	Paltang Lake	0.048	0.029	0.039	0.037	1.36	1.96	2.27	2.20
Turkey	Lake Altun-apa	0.110	...	...	...	...	...	...	...
	Lake Gala	0.680	...	...	...	...	...	...	...
	Lake Sapanca	0.030	...	...	...	...	...	...	...
North America									
Canada	Lake Ontario	0.010	...	0.007	0.006	1.59	...	1.77	1.75
	Lake Superior	0.003	...	...	0.002	1.48	...	...	1.71
	Lake Huron	0.005	0.004	0.004	...	1.52	1.53	1.45	...
Mexico	Laguna Catemaco	...	0.070	0.048	0.046	0.08	0.22	2.00	0.59
	Lake Chapala	0.240	0.570	0.400	0.510	0.15	0.20	0.95	1.34
Europe									
UK	Lake Neagh	...	...	...	...	...	...	...	...
	Lake Lomond	0.019	...	...	...	0.13	...	...	...
Italy	Lake Garda	...	...	...	...	...	...	...	...
	Lake Como	...	...	...	...	...	...	...	...
	Lake Maggiore	...	...	...	...	...	...	...	...
Austria	Lake Ossiach	...	0.011	0.011	...	...	...	...	...
	Lake Mondsee	...	0.008	0.006	...	...	...	...	...
Switzerland	Lake Geneva	0.055	0.036	...	...	0.69	0.68	...	...
Sweden	Lake Vanern	0.009	0.006	0.006	...	0.79	0.82	0.61	...
	Lake Vattern	0.007	0.003	0.003	...	0.69	0.73	0.67	...
	Lake Malaren	0.025	0.024	0.022	...	0.58	0.66	0.52	...
Denmark	Lake Arreso	0.514	0.194	0.094	...	3.50	2.61	1.39	...
	Lake Furesø	0.169	0.097	0.074	...	0.97	0.82	0.68	...
Germany	Lake Bodensee	0.021	0.011	...	...	...	...	...	...
Norway	Lake Mjosa	...	...	...	...	...	...	...	...
	Fjordland	...	...	...	...	...	...	...	...
Hungary	Lake Balaton	0.036	0.086	...	...	0.78	0.79	...	...
Finland	Lake Parr	0.027	0.024	...	...	0.93	0.89	...	...
	Lake Päijänne	0.014	0.013	...	...	0.62	0.78	...	...
	Lake Yli-Kitka	0.017	0.014	...	...	0.45	0.54	...	...
France	Lake Annecy	0.010	...	...	...	0.07	...	...	...
	Lac de Biscarrosse et de Parentis	...	...	...	...	...	...	...	...
Luxemburg	Lake Echternach	...	...	...	...	...	...	...	...
Oceania									
New Zealand	Lake Taupo	...	0.007	...	...	...	0.07	...	...

Notes:

• The annual averages of concentrations of phosphorus and nitrogen in each lake. Use the figures with caution because measuring methods may differ from countries or regions, and surveyed years.

Total Phosphorus: The total amount of phosphorus in inorganic and organic phosphorus compounds existing in water.

Total Nitrogen: The total of inorganic nitrogen, which is classified into ammonium nitrogen, nitrite nitrogen and nitrate nitrogen and organic nitrogen existing in water.

Source: OECD Stat, Environment, Water

2.25 Population accessible to sewage treatment facilities

(Unit : %)

(Unit : %)																									
Country (region)	Primary treatment						Secondary treatment						Tertiary treatment						Total						
	2000	2005	2010	2012	2013	2014	2000	2005	2010	2012	2013	2014	2000	2005	2010	2012	2013	2014	2000	2005	2010	2012	2013	2014	
Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mexico	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59.2	67.6	70.6	-	-	-	
USA	2.3	-	-	1.3	-	-	32.0	-	-	28.5	-	-	36.6	-	-	40.6	-	-	75.4	-	-	75.4	-	-	
Japan	0.0	0.0	0.0	0.0	0.0	0.0	54.0	55.3	54.9	53.9	52.8	51.8	8.0	14.0	20.2	22.4	24.2	25.8	62.0	69.3	75.1	76.3	77.0	77.6	
South Korea	1.1	0.7	0.0	0.0	0.0	0.0	68.0	64.7	35.5	31.1	10.0	9.1	0.8	17.6	54.1	59.9	82.1	82.8	70.5	83.5	90.1	91.6	92.1	92.5	
Australia	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
New Zealand	14.0	-	-	-	-	-	26.0	-	-	-	-	-	40.0	-	-	-	-	-	-	-	-	-	-	-	
Austria	-	-	0.0	0.0	-	0.0	-	-	1.3	1.0	-	1.2	-	-	92.6	93.5	-	93.8	85.4	-	93.9	94.5	-	95.0	
Belgium	0.0	0.0	0.0	0.0	0.0	-	5.5	7.7	8.6	9.8	10.8	-	35.6	46.7	66.4	71.5	73.4	-	79.1	84.0	82.2	88.6	91.4	-	
Czech Republic	-	0.2	0.1	0.1	0.2	0.2	-	16.9	8.7	8.6	8.2	7.2	-	55.9	68.2	69.4	71.6	73.4	72.4	76.7	82.3	83.0	84.7	85.3	
Denmark	0.7	-	2.4	2.3	0.8	0.0	4.4	-	2.4	1.8	1.9	2.0	82.7	-	85.6	86.6	88.2	89.1	87.8	-	90.3	90.7	90.9	91.0	
Finland	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	80.0	-	83.0	83.0	83.0	-	80.0	-	83.0	83.0	83.0	-	
France	-	-	0.0	0.4	0.1	0.1	-	-	13.2	16.1	16.0	14.3	-	-	64.5	64.0	64.4	66.0	-	-	82.0	82.0	82.1	82.1	
Germany	-	-	0.0	0.0	0.0	0.0	-	-	3.0	2.7	2.5	-	-	-	92.6	92.8	92.8	-	-	-	96.4	96.0	96.8	-	
Greece	-	-	0.0	0.0	-	-	-	-	7.8	6.3	3.6	3.6	-	-	79.6	85.8	89.3	89.3	-	-	87.3	92.0	92.8	92.8	
Hungary	16.2	18.9	2.3	0.1	0.1	0.0	24.3	20.4	36.4	17.9	16.1	17.8	5.5	21.3	33.1	54.9	56.5	55.9	51.0	64.8	72.4	74.0	75.0	76.9	
Iceland	33.0	55.0	65.0	-	-	-	0.0	2.0	0.0	-	-	-	0.0	0.0	1.0	-	-	-	90.0	89.0	91.0	-	-	-	
Ireland	-	-	-	-	1.2	0.8	-	-	-	-	46.5	47.0	-	-	-	-	17.8	17.6	-	-	-	-	68.6	68.6	
Italy	-	2.3	-	3.3	-	-	-	18.3	-	22.4	-	-	-	35.9	-	35.2	-	-	-	-	-	-	-	-	
Luxembourg	-	-	4.4	2.0	1.9	1.8	-	-	62.0	27.3	26.5	26.7	-	-	29.3	68.8	69.8	70.0	-	-	97.1	100.0	100.0	100.0	
Netherlands	0.0	0.0	0.0	0.0	0.0	0.0	16.5	5.0	1.3	0.7	1.0	1.0	81.6	94.0	98.1	98.7	98.4	98.4	98.2	99.0	99.3	99.4	99.4	99.4	
Norway	22.1	20.6	21.9	19.1	19.3	19.4	0.9	1.4	1.6	1.4	1.4	1.6	51.1	56.6	57.6	61.2	61.2	61.2	79.9	83.6	85.1	85.2	85.3	85.2	
Poland	3.4	2.1	0.1	0.2	0.1	0.0	30.1	20.8	14.9	13.9	14.2	13.8	20.1	37.3	49.6	54.6	56.0	57.6	53.6	60.2	64.6	68.7	70.3	71.5	
Portugal	-	10.9	-	-	-	-	-	27.4	-	-	-	-	-	15.2	-	-	-	-	-	74.0	-	-	-	-	
Slovakia	10.0	5.0	0.4	0.5	0.5	0.4	10.9	21.2	35.0	34.8	33.1	32.3	1.4	10.9	16.3	19.8	23.0	23.7	62.6	62.6	62.6	62.6	62.6	62.6	
Spain	1.0	1.0	3.0	0.6	-	1.7	65.0	-	33.0	28.1	-	23.9	15.0	-	60.0	66.7	-	69.0	93.0	-	98.0	99.1	-	97.2	
Sweden	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	4.0	4.0	4.0	4.0	81.0	81.0	82.0	83.0	83.0	83.0	86.0	86.0	86.0	87.0	87.0	87.0	
Switzerland	0.0	0.1	0.0	-	0.0	-	22.0	19.7	19.8	-	11.0	-	74.0	77.0	77.5	-	87.0	-	96.0	96.8	97.3	-	98.0	-	
Turkey	8.0	13.6	14.4	16.3	-	20.9	14.6	18.5	19.8	20.2	-	24.8	3.7	10.0	17.8	21.8	-	18.4	63.0	68.8	78.7	83.8	-	87.0	
UK	3.6	0.1	0.0	-	-	0.1	64.0	56.4	49.6	-	-	43.0	27.0	42.9	49.9	-	-	56.9	96.6	99.3	100.0	-	-	-	

Source: OECD Stat, Environment, Water

2.26 Amount of water intake and fresh water resources by country (1)

Country	Water resource		Annual amount of water intake				
	Domestic water flow (km ³)	Per person (m ³)	Total (km ³)	Shares in water resources(%)	Agriculture (%)	Industry (%)	Life (%)
	2014	2014			2014		
World	42,801	5,922	3,986	9.3	70.0	19.0	11.0
Asia							
Japan	430	3,378	82	18.9	67.0	14.0	19.0
Afghanistan	47	1,439	20	43.0	99.0	1.0	1.0
Yemen	2	80	4	169.8	91.0	2.0	7.0
Israel	1	91	2	260.5	58.0	6.0	36.0
Iraq	35	1,006	66	187.5	79.0	15.0	7.0
Iran	129	1,639	93	72.6	92.0	1.0	7.0
India	1,446	1,118	761	52.6	90.0	2.0	7.0
Indonesia	2,019	7,914	113	5.6	82.0	7.0	12.0
South Korea	65	1,278	29	45.0	55.0	15.0	24.0
North Korea	67	2,668	9	12.9	76.0	13.0	10.0
Kuwait	0	0	1	..	54.0	2.0	44.0
Saudi Arabia	2	78	24	986.3	88.0	3.0	9.0
Syria	7	371	17	235.0	88.0	4.0	9.0
Sri Lanka	53	2,542	13	24.5	87.0	6.0	6.0
Thailand	225	3,281	57	25.5	90.0	5.0	5.0
China	2,813	2,062	608	21.6	65.0	23.0	12.0
Turkey	227	2,947	42	18.5	81.0	11.0	15.0
Nepal	198	6,998	10	4.8	98.0	0.0	2.0
Pakistan	55	296	184	333.6	94.0	1.0	5.0
Bangladesh	105	659	36	34.2	88.0	2.0	10.0
Philippines	479	4,785	82	17.0	82.0	10.0	8.0
Vietnam	359	3,961	82	22.8	95.0	4.0	1.0
Malaysia	580	19,187	11	1.9	22.0	43.0	35.0
Myanmar	1,003	19,317	33	3.3	89.0	1.0	10.0
Mongolia	35	11,902	1	1.6	44.0	43.0	13.0
Jordan	1	77	1	138.0	65.0	4.0	31.0
Laos	190	28,952	4	1.8	91.0	5.0	4.0
Lebanon	5	857	1	27.3	60.0	11.0	29.0
Oceania							
Australia	492	20,971	20	4.0	66.0	13.0	22.0
New Zealand	327	72,510	5	1.6	62.0	23.0	16.0
Papua New Guinea	801	103,278	0	0.0	0.0	43.0	57.0
North & Latin America							
USA	2,818	8,846	486	17.0	36.0	51.0	13.0
El Salvador	16	2,488	2	13.6	68.0	10.0	22.0
Canada	2,850	80,181	39	1.4	12.0	80.0	14.0
Guatemala	109	6,858	3	3.0	57.0	18.0	25.0
Costa Rica	113	23,752	2	2.1	57.0	11.0	32.0
Jamaica	11	3,780	1	7.5	55.0	9.0	35.0
Dominican Republic	24	2,258	7	30.5	80.0	8.0	12.0
Nicaragua	156	25,973	2	1.0	77.0	5.0	19.0
Haiti	13	1,231	2	11.1	83.0	4.0	13.0
Panama	137	34,990	1	0.8	43.0	1.0	56.0
Honduras	91	10,291	2	1.8	73.0	7.0	20.0
Mexico	409	3,293	80	19.6	77.0	9.0	14.0
South America							
Argentina	292	6,794	38	12.9	74.0	11.0	15.0
Uruguay	92	26,963	4	4.0	87.0	2.0	11.0
Ecuador	442	27,818	10	2.2	81.0	6.0	13.0
Colombia	2,145	44,882	12	0.5	54.0	19.0	27.0
Chile	885	50,245	35	4.0	83.0	13.0	4.0
Paraguay	117	17,856	2	2.1	79.0	6.0	15.0
Brazil	5,661	27,721	75	1.3	60.0	17.0	23.0
Venezuela	805	26,189	23	2.8	74.0	4.0	23.0
Peru	1,641	52,981	14	0.8	89.0	2.0	9.0
Bolivia	304	28,735	2	0.7	92.0	2.0	7.0
Europe							
Ireland	49	10,612	1	1.5	15.0	7.0	83.0
Albania	27	9,311	1	4.9	39.0	18.0	43.0
Italy	183	3,002	54	29.5	44.0	36.0	18.0
Ukraine	55	1,217	15	27.0	30.0	48.0	22.0
Ukraine	145	2,244	8	5.7	13.0	14.0	71.0
Austria	55	6,439	4	6.3	2.0	77.0	21.0
Netherlands	11	652	11	97.5	1.0	88.0	11.0
Greece	58	5,325	10	16.6	88.0	3.0	9.0
Switzerland	40	4,934	2	4.9	8.0	32.0	60.0
Sweden	171	17,636	3	1.6	4.0	58.0	38.0
Spain	111	2,392	37	33.6	68.0	18.0	14.0
Slovakia	13	2,325	1	4.4	4.0	49.0	46.0
Slovenia	19	9,054	1	6.2	0.0	85.0	14.0
Czech Republic	13	1,249	2	12.5	3.0	61.0	38.0
Denmark	6	1,063	1	10.9	25.0	20.0	55.0
Germany	107	1,321	33	30.9	1.0	83.0	14.0
Norway	382	74,359	3	0.8	28.0	41.0	31.0
Hungary	6	608	5	84.2	6.0	79.0	14.0
Finland	107	19,592	7	6.1	1.0	82.0	6.0
France	200	3,015	31	35.1	10.0	71.0	18.0
Bulgaria	21	2,907	6	26.0	14.0	72.0	16.0
Belgium	12	1,071	6	50.0	1.0	88.0	12.0
Poland	54	1,410	12	21.4	10.0	74.0	18.0
Portugal	38	3,653	9	24.1	79.0	13.0	11.0

2.26 Amount of water intake and fresh water resources by country (2)

Country	Water resource		Annual amount of water intake				
	Domestic water flow (km ³)	Per person (m ³)	Total (km ³)	Shares in water resources(%)	Agriculture (%)	Industry (%)	Life (%)
	2014	2014			2014		
Romania	42	2,129	6	15.1	18.0	67.0	15.0
Russia	4,312	29,982	61	1.4	20.0	60.0	20.0
Africa							
Algeria	11	288	8	74.9	59.0	5.0	36.0
Angola	148	5,498	1	0.5	21.0	34.0	45.0
Uganda	39	1,004	1	1.6	41.0	8.0	51.0
Egypt	2	20	78	4,333.3	86.0	3.0	12.0
Ethiopia	122	1,253	11	8.6	92.0	1.0	10.0
Eritrea	3	674	1	20.8	95.0	0.0	5.0
Ghana	30	1,124	1	3.2	66.0	10.0	24.0
Cameroon	273	12,275	1	0.4	76.0	7.0	17.0
Guinea	226	19,144	1	0.2	53.0	9.0	38.0
Kenya	21	450	3	15.5	59.0	4.0	37.0
Ivory Coast	77	3,410	2	2.0	38.0	21.0	41.0
Democratic Republic of Congo	900	12,208	1	0.1	11.0	21.0	68.0
Zambia	80	5,134	2	2.0	73.0	8.0	18.0
Sierra Leone	160	22,602	0	0.1	22.0	26.0	52.0
Zimbabwe	12	796	4	29.1	82.0	6.0	12.0
Sudan	4	102	27	673.3	96.0	0.0	4.0
Senegal	26	1,774	2	8.6	93.0	3.0	4.0
Somalia	6	444	3	55.0	99.0	0.0	0.0
Tanzania	84	1,608	5	6.2	89.0	0.0	10.0
Chad	15	1,105	1	5.9	76.0	12.0	12.0
Central Africa	141	31,227	0	0.1	1.0	17.0	83.0
Tunisia	4	376	3	78.8	80.0	5.0	15.0
Togo	12	1,591	0	1.5	45.0	2.0	53.0
Nigeria	221	1,252	13	5.9	54.0	15.0	31.0
Namibia	6	2,598	0	4.7	70.0	5.0	25.0
Niger	4	183	1	28.1	67.0	3.0	30.0
Burkina Faso	13	711	1	6.5	51.0	3.0	46.0
Burundi	10	1,017	0	2.9	77.0	6.0	17.0
Benin	10	1,001	0	1.3	45.0	23.0	32.0
Botswana	2	1,107	0	8.1	41.0	18.0	41.0
Madagascar	337	14,286	17	4.9	98.0	1.0	1.0
Malawi	16	946	1	8.4	86.0	4.0	11.0
Mali	60	3,537	5	8.6	98.0	0.0	2.0
South Africa	45	827	16	34.6	63.0	10.0	27.0
Mauritania	0	98	1	337.5	91.0	2.0	7.0
Mozambique	100	3,686	1	0.9	78.0	3.0	19.0
Morocco	29	845	10	36.0	88.0	2.0	10.0
Libya	1	113	6	832.9	83.0	5.0	12.0
Rwanda	10	837	0	1.6	68.0	8.0	24.0
Lesotho	5	2,437	0	0.8	9.0	46.0	46.0

Source: "The World Development Indicators 2017," The World Bank

2.27 Ocean-dumping of Waste

(Unit: 10,000 t)

	Industrial waste	Non-industrial waste	Dredged soil	Total
1996	347	247	1,187	1,781
1997	333	240	647	1,220
1998	320	219	705	1,244
1999	292	189	663	1,144
2000	314	171	543	1,027
2001	285	149	627	1,061
2002	263	127	559	949
2003	284	100	658	1,042
2004	292	87	968	1,346
2005	272	77	425	774
2006	255	64	507	827
2007	255	4	369	628
2008	264	0	304	568
2009	208	0	236	444
2010	183	0	255	438
2011	178	0	203	381
2012	173	0	251	424
2013	129	0	223	352
2014	102	0	254	356
2015	64	0	238	302

Note:

- "Total" may not be consistent with a sum of each column due to rounding at the first decimal place.
- Ocean dumping of non-industrial waste has been prohibited since April 1st, 2007.

Sources: • Japan Coast Guard (up to March, 2007)

• Report based on Act on Prevention of Marine Pollution and Maritime Disaster (From April, 2007)

2.28 Consumption of fertilizer by country

(Unit: 1,000 t)

Country (region)	Nitrogen fertilizer (N)			Phosphatic fertilizer (P ₂ O ₅)			Potash fertilizer (K ₂ O)		
	2012	2013	2014	2012	2013	2014	2012	2013	2014
World	106,282	107,080	108,937	45,469	45,689	46,698	34,345	35,502	37,655
Asia									
Japan	433	437	401	391	360	377	260	275	278
Iran	308	261	262	140	219	170	22	17	32
India	16,860	* 16,732	* 16,935	6,947	* 5,941	* 6,367	1,989	* 2,058	* 2,517
Indonesia	2,947	2,791	2,909	681	749	768	1,200	1,200	1,300
Uzbekistan	634	658	687	186	191	211	45	67	69
South Korea	303	238	254	213	151	168	216	151	169
Saudi Arabia	438	360	335	685	535	501	4	7	12
Thailand	1,571	1,623	1,521	503	602	452	439	583	587
China	30,566	30,732	30,911	14,853	15,096	15,435	12,744	13,064	13,401
Turkey	1,432	1,584	1,492	532	623	570	101	106	117
Pakistan	2,847	3,235	3,134	669	866	926	20	20	30
Bangladesh	1,130	1,112	1,230	500	500	565	368	343	346
Philippines	424	287	690	100	74	174	46	40	160
Vietnam	1,164	1,607	1,393	459	599	592	502	623	562
Malaysia	478	441	508	342	402	460	733	802	1,000
North America									
USA	12,938	12,529	12,428	3,972	4,226	4,251	4,267	4,515	4,594
Canada	2,503	2,893	2,835	737	809	901	350	380	380
Mexico	1,291	1,290	1,362	321	307	383	203	212	177
South America									
Argentina	721	772	780	638	622	595	45	41	34
Colombia	619	569	609	294	287	284	266	235	294
Brazil	4,251	3,954	3,872	4,343	4,676	4,752	4,601	4,721	5,395
Europe									
UK	999	1,060	* 1,049	194	201	* 196	267	284	* 272
Italy	685	* 600	600	208	* 171	171	181	* 110	110
Ukraine	928	1,041	1,020	220	236	241	194	213	209
Spain	843	962	1,102	377	433	399	321	355	358
Czech Republic	340	332	329	41	41	42	22	30	34
Germany	1,649	1,675	1,823	284	284	301	421	457	460
Hungary	303	340	311	62	72	65	63	70	60
France	1,915	2,005	* 2,200	253	259	* 188	337	310	* 389
Bulgaria	318	380	373	69	70	73	17	24	18
Belarus	557	535	456	221	208	153	720	683	609
Poland	1,179	1,098	1,632	374	341	352	390	496	547
Russia	1,180	1,167	1,194	422	438	466	276	256	274
Africa									
Egypt	1,265	1,347	1,311	373	290	406	32	47	52
Nigeria	262	416	272	62	80	57	74	53	41
South Africa	430	417	437	190	184	193	124	121	128
Oceania									
Australia	1,125	1,222	1,405	884	842	908	188	210	232
New Zealand	301	308	328	518	469	512	42	39	40

Note:

* Indicates a provisional or estimated value.

Source: "World Statistics 2017," Ministry of Internal Affairs and Communications

2.29 Changes in land-use by country

(Unit: 1,000 ha)

Country	Arable land, permanent cropland								Permanent meadows							
	1995	2000	2005	2010	2011	2012	2013	2014	1995	2000	2005	2010	2011	2012	2013	2014
Japan	5,038	4,830	4,692	4,593	4,561	4,549	4,537	4,519	405	428						
China	130,880	130,027	125,439	122,538	122,533	122,527	122,524	122,524	392,834	392,834	392,834	392,831	392,834	392,834	392,834	392,834
India	169,911	170,130	169,674	169,234	169,369	169,346	169,372	169,360	11,034	10,845	10,452	10,339	10,301	10,296	10,240	10,240
South Korea	1,985	1,918	1,824	1,715	1,698	1,730	1,711	1,691	63	55	57	58	58	58	58	57
Australia	40,300	47,600	49,742	42,968	48,078	47,493	46,611	47,307	423,048	407,900	395,407	355,612	361,595	357,981	350,004	358,962
New Zealand	1,625	1,550	488	570	542	580	618	657	13,350	13,863	11,224	10,838	10,829	10,629	10,488	10,459
Canada	52,312	52,178	52,139	48,418	47,894	50,846	50,751	50,656	15,682	15,435	15,430	14,851	14,703	14,600	14,600	14,600
Mexico	24,952	25,378	25,903	26,158	25,658	25,808	25,668	25,670	81,243	80,952	80,667	80,547	81,047	80,897	81,037	81,035
USA	184,139	178,068	167,815	158,526	154,269	157,708	154,842	157,205	236,000	236,331	243,969	249,900	250,400	250,999	251,000	251,000
Austria	1,492	1,470	1,447	1,429	1,425	1,420	1,419	1,417	1,489	1,470	1,410	1,350	1,332	1,315	1,297	1,297
Belgium		883	864	856	847	825	838	839		507	519	500	489	507	498	492
Czech Republic	3,378	3,319	3,286	3,248	3,240	3,233	3,225	3,219	902	961	974	986	989	992	994	997
Denmark	2,328	2,289	2,339	2,426	2,503	2,424	2,414	2,436	398	358	368	200	187	200	195	193
Finland	2,146	2,192	2,241	2,259	2,255	2,253	2,228	2,234	98	26	33	33	32	32	31	33
France	19,348	19,495	19,488	19,311	19,281	19,286	19,302	19,328	10,802	10,312	9,902	9,615	9,597	9,559	9,472	9,438
Germany	12,061	12,020	12,102	12,045	12,075	12,034	12,076	12,074	5,282	5,048	4,929	4,655	4,644	4,630	4,621	4,651
Greece	3,904	3,854	3,775	3,704	3,700	3,676	3,746	3,725	5,260	4,675	4,580	4,490	4,480	4,470	4,460	4,450
Hungary	5,031	4,803	4,806	4,580	4,578	4,579	4,581	4,585	1,148	1,051	1,057	763	759	759	759	761
Iceland	135	129	129	123	122	121	121	121	1,764	1,760	1,753	1,751	1,751	1,751	1,751	1,751
Ireland	1,033	1,079	1,187	1,013	1,063	1,171	1,114	1,059	3,356	3,333	3,115	3,555	3,492	3,362	3,363	3,407
Italy	10,928	11,284	10,334	9,630	9,241	9,560	9,087	9,121	4,405	4,353	4,402	4,698	4,612	4,169	4,543	4,041
Netherlands	916	944	1,143	1,059	1,042	1,047	1,075	1,081	1,048	1,012	795	813	816	795	773	758
Norway	992	884	867	830	822	816	811	811	135	158	169	176	177	177	176	176
Poland	14,575	14,330	12,519	11,219	11,488	11,323	11,204	11,304	4,047	4,083	3,387	3,230	3,291	3,206	3,206	3,120
Portugal	2,900	2,397	2,052	1,862	1,849	1,856	1,900	1,885	1,024	1,433	1,769	1,792	1,801	1,809	1,817	1,817
Russia	129,400	126,238	123,581	120,650	121,650	121,350	123,840	124,722	87,000	90,924	92,099	93,302	93,000	93,000	93,000	93,000
Slovakia	1,606	1,575	1,417	1,417	1,412	1,413	1,415	1,413	840	865	524	527	518	515	514	511
Spain	18,753	18,304	17,844	17,221	16,992	17,539	17,133	17,188	10,966	11,462	11,320	10,324	10,022	9,403	9,600	9,390
Switzerland	190	191	192	190	190	190	190	190	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032
Sweden	2,767	2,706	2,703	2,634	2,619	2,608	2,605	2,597	500	447	513	451	447	441	443	436
Turkey	27,115	26,379	26,606	24,395	23,630	23,790	23,806	23,944	12,378	14,100	14,617	14,617	14,617	14,617	14,617	14,617
UK	5,993	5,928	5,776	6,016	6,107	6,258	6,310	6,278	11,386	11,036	11,180	11,208	11,057	10,924	10,940	10,954
World	1,535,389	1,537,453	1,554,217	1,547,465	1,560,439	1,574,173	1,576,532	1,584,563	3,393,633	3,417,095	3,386,196	3,321,977	3,319,784	3,315,544	3,309,699	3,315,542

Note:

Includes estimation.

Source: Compiled from FAOSTAT, Food and Agriculture Organization (<http://faostat.fao.org/>)

2.30 Threatened species in each country (1)

	Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusks	Others	Plants	Fungi, Protists	Total
●Africa										
North Africa										
Algeria	14	14	8	3	40	10	26	18	0	133
Egypt	19	14	12	0	52	0	56	3	0	156
Libya	11	6	6	0	32	0	4	3	0	62
Morocco	18	16	13	2	54	35	29	37	1	205
Tunisia	14	10	6	1	39	6	12	7	0	95
Western Sahara	10	4	1	0	31	0	3	0	0	49
Sub-Saharan Africa										
Angola	18	29	5	0	51	5	4	34	0	146
Benin	13	10	6	0	38	0	3	17	0	87
Botswana	10	14	0	0	2	0	0	2	0	28
Burkina Faso	10	10	3	0	4	1	0	3	0	31
Burundi	14	15	0	1	17	4	3	8	0	62
Cameroon	44	27	12	56	119	11	16	491	0	776
Cape Verde	4	6	6	0	34	12	1	3	0	66
Central African Republic	15	13	4	0	3	0	0	24	0	59
Chad	15	13	4	0	1	4	0	6	0	43
Comoros	5	14	5	0	9	0	73	7	0	113
Republic of Congo	17	6	4	0	55	5	2	45	0	134
Congo, The Democratic Republic of the	34	39	7	10	92	43	10	113	0	348
Côte d'Ivoire	30	21	7	14	57	3	3	113	0	248
Djibouti	8	11	1	0	18	1	56	3	0	98
Equatorial Guinea	24	7	7	5	42	0	5	88	0	178
Eritrea	12	17	6	0	24	1	57	4	0	121
Ethiopia	30	32	2	12	14	4	11	42	0	147
Gabon	20	7	5	3	71	0	3	162	0	271
Gambia	9	12	5	0	34	0	2	5	0	67
Ghana	20	20	7	11	56	0	5	120	0	239
Guinea	27	19	8	5	75	1	6	44	0	185
Guinea-Bissau	14	10	7	0	39	0	2	5	0	77
Kenya	27	42	11	11	72	19	67	230	0	479
Lesotho	3	7	0	0	1	0	3	4	0	18
Liberia	22	13	7	4	63	1	10	52	0	172
Madagascar	120	35	139	141	108	35	87	609	0	1,274
Malawi	10	18	4	6	98	7	9	24	0	176
Mali	13	15	4	0	2	0	0	8	0	42
Mauritania	18	16	6	0	43	0	3	0	0	86
Mauritius	7	10	10	0	20	29	90	90	0	256
Mayotte	1	3	7	0	7	0	69	0	0	87
Mozambique	15	29	13	5	67	3	64	91	0	287
Namibia	15	30	5	1	33	0	4	27	0	115
Niger	13	11	2	0	4	1	0	3	0	34
Nigeria	30	22	12	13	71	1	16	197	0	362
Réunion	5	6	0	0	13	17	71	17	0	129
Rwanda	24	18	0	2	7	0	4	8	0	63
St. Helena, Association and Tristan da Cunha	4	21	2	0	14	1	14	44	0	100
Sao Tome and Principe	5	14	5	3	25	1	4	38	0	95
Senegal	18	17	8	0	55	10	3	12	0	123
Seychelles	6	12	11	6	22	36	284	62	0	439
Sierra Leone	22	15	8	3	56	3	5	66	0	178
Somalia	15	19	5	0	29	2	60	46	0	176
South Africa	27	48	21	18	108	22	180	146	0	570
South Sudan	12	19	3	0	0	0	0	15	0	49
Sudan	13	23	5	0	26	0	50	16	0	133
Swaziland	8	11	0	0	4	0	0	11	0	34
Tanzania, United Republic of	37	50	34	61	175	11	114	602	0	1,084
Togo	12	11	5	2	35	0	3	12	0	80
Uganda	28	27	3	2	60	13	11	52	0	196
Zambia	13	18	2	0	20	13	1	20	0	87
Zimbabwe	10	17	4	7	3	0	5	17	0	63
Antarctica										
The Antarctic Continent	2	4	0	0	0	0	0	0	0	6
Bouvet Island	1	1	0	0	1	0	0	0	0	3
French Southern Territories	3	13	4	0	5	0	0	0	0	25
Heard Island and McDonald Islands	1	10	0	0	1	0	0	0	0	12
South Georgia and the South Sandwich Islands	3	6	0	0	0	0	0	0	0	9
●Asia										
East Asia										
China	74	93	43	87	133	15	61	573	1	1,080
Hong Kong	3	21	5	5	13	1	7	9	0	64
Japan	28	45	14	20	77	33	138	47	2	404
Korea, Democratic People's Republic of	10	28	2	1	17	0	3	17	0	78
Korea, Republic of	11	32	3	3	25	0	5	31	1	111
Macao	0	4	1	0	5	0	1	0	0	11
Mongolia	11	25	0	0	2	0	3	0	0	41
Taiwan, Province of China	10	24	9	10	70	1	127	85	1	337
North Asia										
Belarus	4	9	0	0	2	3	6	1	0	25
Moldavia	5	12	2	0	8	2	4	2	0	35
Russian Federation	33	55	9	0	39	8	31	56	4	235
Ukraine	10	18	1	0	24	6	25	17	1	102
South and Southeast Asia										
Bangladesh	36	36	23	1	27	0	7	21	0	151
Bhutan	25	20	3	1	3	0	1	18	0	71
British Indian Ocean Territory	0	0	2	0	13	0	69	1	0	85
Brunei Darussalam	33	25	8	3	12	0	8	104	0	193
Cambodia	38	28	20	8	47	1	78	35	0	255
Disputed territory (includes Paracel Islands and Spratly Islands)	0	0	0	0	3	0	1	0	0	4
India	92	87	54	75	222	7	128	387	0	1,052
Indonesia	187	154	33	32	159	6	284	427	0	1,282
Lao Peoples Democratic Republic	45	24	18	5	55	16	5	41	0	209
Malaysia	72	53	31	48	83	37	227	720	0	1,271
Maldives	2	0	3	0	24	0	46	0	0	75
Myanmar	48	52	30	2	51	3	74	61	0	321
Nepal	29	36	9	3	7	1	2	17	0	104
Philippines	39	92	39	48	88	3	234	239	0	782
Singapore	13	17	6	0	27	0	173	57	0	293
Sri Lanka	29	16	12	56	54	0	130	291	0	588
Thailand	57	54	28	3	106	15	196	152	0	611
Timor-Leste	5	7	2	0	9	0	1	1	0	25
Vietnam	55	47	49	29	80	30	122	204	0	616

2.30 Threatened species in each country (2)

	Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusks	Others	Plants	Fungi, Protists	Total
West and Central Asia										
Afghanistan	11	17	1	1	5	0	2	5	0	42
Armenia	9	15	7	0	3	2	7	71	0	114
Azerbaijan	8	18	9	1	12	2	5	42	0	97
Bahrain	3	6	4	0	10	0	13	0	0	36
Cyprus	6	7	5	0	24	1	11	18	0	72
Georgia	9	15	7	1	11	4	11	61	1	120
Iran, Islamic Republic of	18	27	14	4	43	2	22	4	0	134
Iraq	14	18	3	1	17	1	16	2	0	72
Israel	15	18	10	2	45	11	63	10	0	174
Jordan	13	13	6	0	15	6	55	5	0	113
Kazakhstan	16	27	1	1	14	2	5	16	0	82
Kuwait	6	11	4	0	15	0	13	0	0	49
Kirghizstan	5	16	2	0	3	0	4	14	0	44
Lebanon	10	12	8	0	28	9	8	11	0	86
Oman	10	13	8	0	31	2	29	6	0	99
Pakistan	25	32	12	0	41	0	18	12	0	140
Palestine Territory, Occupied	3	14	4	1	2	2	2	3	0	31
Qatar	2	8	3	0	13	0	13	0	0	39
Saudi Arabia	10	19	3	0	36	1	58	4	0	131
Syrian Arab Republic	16	18	9	0	51	9	11	18	0	132
Tajikistan	7	15	2	0	5	0	3	12	0	44
Turkey	18	20	20	11	131	45	37	106	1	389
Turkmenistan	10	20	2	0	11	1	6	4	0	54
United Arab Emirates	8	12	4	0	17	0	15	0	0	56
Uzbekistan	10	20	2	0	7	1	2	17	0	59
Yemen	9	18	7	1	33	2	66	162	0	298
Europe										
Europe										
Albania	3	10	4	2	44	49	19	0	0	131
Andorra	2	2	1	0	0	3	5	0	0	13
Austria	3	12	1	0	11	43	28	13	8	119
Belgium	2	8	0	0	13	6	8	0	1	38
Bosnia and Herzegovina	4	8	3	1	35	17	22	1	0	91
Bulgaria	8	18	2	0	22	25	23	6	0	104
Croatia	9	15	4	2	64	45	28	8	1	176
Czech Republic	3	10	0	0	2	6	18	10	5	54
Denmark	2	8	0	0	18	5	10	1	3	47
Estonia	1	9	0	0	5	3	3	0	2	23
Faeroe Islands	4	5	0	0	12	0	0	0	1	22
Finland	2	10	0	0	6	3	7	2	6	36
France	9	14	5	2	52	91	59	35	8	275
Germany	5	11	0	0	24	31	26	12	7	116
Gibraltar	4	4	0	0	18	3	2	0	0	31
Greece	11	16	9	5	80	65	127	59	1	373
Greenland	9	4	0	0	9	0	0	1	0	23
Guernsey	0	0	0	0	5	0	0	0	0	5
Holly See (Vatican City State)	1	0	0	0	0	0	0	0	0	1
Hungary	3	13	1	0	9	8	21	9	2	66
Iceland	6	5	0	0	16	0	0	0	0	27
Ireland	5	8	1	0	27	2	4	1	2	50
Isle of Man	1	0	0	0	2	0	0	0	0	3
Italy	8	15	4	9	51	72	118	71	7	355
Jersey	0	0	0	0	5	0	1	0	0	6
Latvia	1	10	0	0	6	4	8	0	1	30
Liechtenstein	0	2	0	0	0	2	2	0	0	6
Lithuania	2	9	0	0	6	2	5	1	1	26
Luxembourg	0	3	0	0	1	5	2	0	0	11
Macedonia, the former Yugoslav Republic of	6	13	2	0	13	61	14	0	0	109
Malta	2	5	1	0	22	3	2	4	0	39
Monaco	3	0	0	0	15	0	3	0	0	21
Montenegro	6	14	4	1	32	20	19	2	0	98
Netherlands	3	9	0	0	15	5	5	0	3	40
Norway	8	9	0	0	23	3	7	3	11	64
Poland	5	11	0	0	8	7	15	10	3	59
Portugal	13	13	4	1	63	76	27	82	2	281
Romania	8	18	2	0	22	11	38	5	0	104
San Marino	0	0	0	0	0	0	1	0	0	1
Serbia	6	13	1	0	15	5	25	5	1	71
Slovakia	4	11	0	0	5	6	18	7	3	54
Slovenia	6	8	2	2	33	32	49	7	4	143
Spain	17	17	20	6	78	141	116	217	5	617
Svalbard and Jan Mayen	3	2	0	0	2	0	0	0	0	7
Sweden	1	9	0	0	15	4	11	4	10	54
Switzerland	3	7	0	1	9	10	34	4	6	74
United Kingdom	5	9	1	0	47	5	13	16	6	102
North and Central America										
Central America										
Belize	9	5	8	4	43	0	12	36	0	117
Costa Rica	11	24	12	61	61	1	30	140	0	340
El Salvador	6	6	10	10	15	0	10	29	0	86
Guatemala	15	15	32	78	36	2	11	101	0	290
Honduras	7	12	40	56	42	0	21	123	0	301
Mexico	95	64	97	219	180	8	95	401	0	1,159
Nicaragua	7	15	9	10	37	2	18	46	0	144
Panama	17	23	10	49	54	0	22	208	0	383

2.30 Threatened species in each country (3)

	Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusks	Others	Plants	Fungi, Protists	Total
Caribbean										
Anguilla	1	0	8	0	29	0	10	4	0	52
Antigua and Barbuda	2	2	7	0	29	0	11	4	0	55
Aruba	2	1	2	0	23	1	1	2	0	32
Bahamas	6	8	8	0	44	1	11	8	0	86
Barbados	3	3	7	0	29	0	11	3	0	56
Bermuda Islands	4	2	4	0	26	0	28	8	0	72
Bonaire, Saint Eustatius and Saba	3	2	6	0	31	0	11	3	0	56
Cayman Islands	1	1	7	0	32	1	10	22	0	74
Cuba	12	17	16	49	44	0	23	179	0	340
Curaçao	3	2	5	0	28	0	11	2	0	51
Dominica	3	6	4	2	29	0	11	11	0	66
Dominican Republic	6	15	44	32	29	0	16	42	0	184
Grenada	4	1	7	1	28	0	10	3	0	54
Guadeloupe	4	4	8	3	29	1	15	9	0	73
Haiti	5	15	50	49	30	0	14	42	0	205
Jamaica	6	10	21	15	30	0	15	214	0	311
Martinique	1	5	9	2	20	2	0	9	0	48
Montserrat	2	3	4	1	28	0	11	6	0	55
Puerto Rico	2	9	14	14	30	0	0	57	0	126
Saint Barthélemy	1	0	3	0	14	0	11	2	0	31
Saint Kitts and Nevis	2	2	6	1	29	0	10	2	0	52
Saint Lucia	2	6	7	0	30	0	11	6	0	62
Saint Martin (French part)	2	1	7	0	29	0	10	3	0	52
Saint Vincent and the Grenadines	2	3	8	1	29	0	10	5	0	58
Sint Maarten (Dutch part)	2	1	7	0	29	0	10	2	0	51
Trinidad and Tobago	2	6	7	8	35	0	10	2	0	70
Turks and Caicos Islands	2	3	7	0	29	0	10	9	0	60
Virgin Islands, British	1	2	14	2	28	0	10	10	0	67
Virgin Islands, U.S.	1	2	14	2	27	0	0	12	0	58
North America										
Canada	14	16	6	1	43	7	20	10	4	121
St. Pierre and Miquelon	4	5	0	0	3	0	0	0	0	12
United States	35	79	37	56	250	303	277	465	12	1,514
South America										
South America										
Argentina	36	52	15	30	39	0	14	70	0	256
Bolivia, Plurinational States of	21	54	6	35	8	2	1	104	0	231
Brazil	82	169	29	36	86	22	33	532	0	989
Chile	19	34	7	27	25	1	12	72	0	197
Colombia	54	126	32	215	97	4	48	257	0	833
Ecuador	46	104	39	175	60	49	21	1,856	6	2,356
Falkland Islands (Malvinas)	4	9	0	0	5	0	0	5	0	23
French Guiana	8	8	7	3	29	0	0	18	0	73
Guiana	11	15	5	5	31	0	1	26	0	94
Paraguay	10	27	3	0	0	0	0	19	0	59
Peru	53	121	15	111	50	4	4	326	0	684
Suriname	9	10	6	1	30	0	1	27	0	84
Uruguay	10	22	5	5	40	0	2	22	0	106
Venezuela, Bolivarian Republic of	35	51	18	73	43	1	25	82	0	328
Oceania										
Oceania										
American Samoa	1	8	6	0	12	5	59	1	0	92
Australia	62	52	43	47	119	174	340	93	1	931
Christmas Island	3	3	4	0	10	0	18	1	0	39
Cocos (Keeling) Islands	2	0	1	0	10	0	20	0	0	33
Cook Islands	1	16	3	0	12	0	32	11	0	75
Fiji	6	13	15	1	19	68	97	71	0	290
French Polynesia	0	34	3	0	29	31	31	47	0	175
Guam	2	14	5	0	14	6	54	4	0	99
Kiribati	1	6	2	0	14	1	80	0	0	104
Marshall Islands	2	4	4	0	18	1	72	0	0	101
Micronesia, Federation States of	5	12	7	0	25	3	111	4	0	167
Nauru	1	2	0	0	11	0	68	0	0	82
New Caledonia	9	16	54	0	36	28	97	286	0	526
New Zealand	9	69	15	3	34	32	14	21	2	199
Niue	1	8	4	0	9	0	30	0	0	52
Norfolk Island	0	11	2	0	6	12	11	2	0	44
Northern Mariana Islands	4	17	4	0	15	4	53	5	0	102
Palau	4	6	3	0	20	40	106	4	0	183
Papua New Guinea	39	43	11	11	57	2	179	152	0	494
Pitcairn	1	10	0	0	10	5	11	7	0	44
Samoa	2	6	5	0	16	1	61	2	0	93
Solomon Islands	20	26	6	2	24	2	149	17	0	246
Tokelau	0	1	3	0	10	0	35	0	0	49
Tonga	2	5	5	0	16	4	43	4	0	79
Tuvalu	1	1	3	0	13	1	77	0	0	96
United States Minor Outlying Islands	0	11	2	0	13	0	47	0	0	73
Vanuatu	7	8	4	0	17	3	88	10	0	137
Wallis and Futuna	0	9	2	0	13	0	64	1	0	89

Source: "IUCN Red List version 2016.3 (Updated 2016.12)"

2.31 Areas of agricultural land by country

(Unit: 1,000 ha)

Country (region)	Land area 2014	Arable land		Permanent crops		Others 2014
		2013	2014	2013	2014	
World	13,000,000	1,407,843	1,417,153	163,893	164,650	11,418,197
Asia						
Japan	36,456	4,237	4,223	303	296	31,937
India	297,319	157,000	156,360	12,800	13,000	127,959
Indonesia	181,157	23,500	23,500	22,000	22,500	135,157
Kazakhstan	269,970	29,395	29,395	75	132	240,443
South Korea	9,748	1,496	1,476	208	215	8,057
Saudi Arabia	214,969	3,068	3,502	230	145	211,322
Thailand	51,089	16,810	16,810	4,500	4,500	29,779
China	938,821	105,720	105,700	15,800	16,020	817,101
Turkey	76,963	20,574	20,706	3,213	3,238	53,019
Pakistan	77,088	30,470	30,440	855	812	45,836
Bangladesh	13,017	7,678	7,669	850	830	4,518
Philippines	29,817	5,590	5,590	5,350	5,350	18,877
Malaysia	32,855	954	954	6,500	6,600	25,301
North America						
USA	914,742	151,837	154,605	2,600	2,600	757,537
Canada	909,351	45,915	46,015	4,831	4,641	858,695
Mexico	194,395	22,975	22,993	2,676	2,677	168,725
South America						
Argentina	273,669	36,699	39,200	1,000	1,000	233,469
Brazil	835,814	76,008	80,017	7,000	6,572	749,225
Europe						
Iceland	10,025	121	121	-	-	9,904
Ireland	6,889	1,113	1,058	1	1	5,830
UK	24,193	6,265	6,234	46	45	17,915
Italy	29,414	6,827	6,728	2,442	2,393	20,293
Ukraine	57,929	32,526	32,531	894	893	24,505
Estonia	4,239	632	648	6	6	3,585
Austria	8,252	1,354	1,352	65	65	6,835
Netherlands	3,369	1,038	1,045	36	36	2,288
Greece	12,890	2,547	2,600	1,150	1,125	9,165
Switzerland	3,952	404	400	24	26	3,526
Sweden	40,731	2,596	2,588	9	9	38,134
Spain	50,021	12,570	12,278	4,560	4,910	32,833
Slovakia	4,809	1,394	1,394	20	19	3,395
Czech Republic	7,721	3,149	3,143	76	76	4,502
Denmark	4,226	2,408	2,432	6	4	1,790
Germany	34,890	11,876	11,871	200	203	22,816
Norway	36,525	806	807	5	5	35,713
Hungary	9,053	4,403	4,404	182	181	4,468
Finland	30,389	2,224	2,231	4	3	28,155
France	54,756	18,306	18,333	1,002	995	35,427
Belgium	3,028	816	817	24	22	2,189
Poland	30,619	10,792	10,928	398	376	19,315
Portugal	9,161	1,116	1,137	714	748	7,275
Russia	1,637,687	122,240	123,122	1,600	1,600	1,512,965
Africa						
Egypt	99,545	2,738	2,670	812	1,075	95,800
Nigeria	91,077	34,000	34,000	6,700	6,500	50,577
South Africa	121,309	12,500	12,500	413	413	108,396
Oceania						
Australia	768,230	46,219	46,957	380	350	720,923
New Zealand	26,331	547	590	71	67	25,674

Notes:

The definition of land use may differ from each country (region).

Land area: Total land area, excluding inland water (major rivers and lakes).

Arable land: The land cultivated and harvested with short-term crops (land for successive-cropping is not counted twice).

Includes meadows for pasture grazing and temporary fallow land (for less than 5 years).

Permanent crops: The land cultivated with long-term crops which do not have to be replanted for several years (such as cocoa, coffee and rubber). Including areas of bush, orchards, tree nuts and vine crops. Excluding land planted with trees for timber.

Others: Permanent pasture, woodland, woods, building sites, roads, barren land and other land which is not classified in above items.

Source: "World Statistics," Ministry of Internal Affairs and Communications

2.32 Forest area in each country

Country (region) ¹⁾	Forest (1,000 ha)		Percentage of forest in national land (%)	The changes between 2005 ~ 2015 (1,000 ha) ²⁾
	2005	2015		
World	4,015,673	3,999,134	-	-16,539
Russian Federation	808,790	814,931	52	6,141
Brazil	506,734	493,538	62	-13,196
Canada	347,576	347,069	40	-507
USA	304,757	310,095	35	5,338
China	193,044	208,321	25	15,277
Democratic Republic of the Congo	155,692	152,578	71	-3,114
Australia	127,641	124,751	24	-2,890
Indonesia	97,857	91,010	63	-6,847
Peru	75,528	73,973	62	-1,555
India	67,709	70,682	24	2,973
Mexico	67,083	66,040	38	-1,043
Colombia	60,201	58,502	62	-1,700
Angola	59,104	57,856	46	-1,248
Bolivia	58,734	54,764	52	-3,970
Zambia	50,301	48,635	71	-1,666
Venezuela	47,713	46,683	58	-1,030
United Republic of Tanzania	49,920	46,060	57	-3,860
Mozambique	40,079	37,940	59	-2,139
Papua New Guinea	33,586	33,559	81	-27
Myanmar	33,321	29,041	57	-4,280
Sweden	28,218	28,073	73	-145
Argentina	30,186	27,112	13	-3,074
Japan	24,935	24,958	68	23
Gabon	22,000	23,000	89	1,000
Congo	22,471	22,334	94	-137
Finland	22,143	22,218	75	75
Malaysia	20,890	22,195	68	1,305
Central Africa Republic	22,326	22,170	75	-156
Sudan	20,954	19,210	12	-1,744
Cameroon	21,016	18,816	54	-2,200
Lao People's Democratic Republic	16,870	18,761	93	1,892
Spain	17,282	18,418	45	1,136
Chile	16,042	17,735	30	1,693
France	15,861	16,989	31	1,128
Guyana	16,602	16,526	92	-76
Thailand	16,100	16,399	32	299
Suriname	15,371	15,332	95	-39
Paraguay	18,475	15,323	39	-3,152
Viet nam	13,077	14,773	48	1,696
Zimbabwe	17,259	14,062	36	-3,197
Mongolia	11,308	12,553	8	1,245
Ecuador	13,335	12,548	51	-787
Ethiopia	13,000	12,499	18	-501
Madagascar	12,838	12,473	29	-365
Norway	12,092	12,112	43	20
Turkey	10,662	11,715	18	1,053
Germany	11,384	11,419	33	35
Botswana	11,943	10,840	50	-1,103
Iran	10,692	10,692	6	0
Cote d'Ivoire	10,405	10,401	36	-4

Notes:

Forest is defined as woodland where 10% or more of its tree-crown area is covered with trees 5m high or higher, including seedlings expected to be that high in the future. Forest includes the national parks, natural conservation areas, other protected areas, and windbreaks which are 0.5 ha or more, and 20m wide or wider, additionally, plantations of rubber and cork oak. Excludes trees for agricultural production such as orchards and trees which were grown as agro-forestry tree.

1. Top 50 countries with the largest forest areas in 2015(descending order).

2. A net change after offsetting expansion by plantation against losses and increases in natural forests, calculated from the forest area in 2015 and 2005.

Source: "Global Forest Resources Assessment 2015," Food and Agriculture Organization

2.33 Performance records of Environment-related ODA

Performance records in line with aid form

(Based on aid commitments, unit: million dollar & %)

	Grant aid		Government aid, etc.		Technical aid		Total	
2011	1,044.35	(27.4)	4,039.98	(47.3)	240.57	(6.2)	5,324.91	[32.8]
2012	450.54	(13.5)	5,824.26	(56.5)	373.29	(10.1)	6,648.08	[38.4]
2013	524.46	(9.4)	6,552.38	(49.8)	265.26	(9.3)	7,342.10	[34.0]
2014	270.81	(9.6)	6,665.68	(61.2)	251.60	(9.5)	7,188.09	[43.9]
2015	375.48	(12.9)	8,886.76	(62.4)	195.03	(8.2)	9,457.27	[48.4]

Notes:

- The data are based on DAC_CRS statistics.
- The figures in () under the column of types of aids indicate the ratio of each type to the total.
- () under the total column is percentage of total environment-related ODA in the grand total ODA amount.
- Includes aids for graduated countries.

Source: "ODA reference handbook 2016," Ministry of Foreign Affairs

Small classification of aid between the two countries.

(Based on aid commitments, unit: million dollar & %)

Year	Conservation of environment in general	Biodiversity	Climate change		Combat Desertification	Total
			Alleviation	Adaptation		
2011	25.27 (0.5)	1,476.98 (27.7)	3,827.78 (71.9)	2,368.74 (44.5)	585.09 (11.0)	5,324.91
2012	22.55 (0.3)	450.10 (6.8)	4,486.03 (67.5)	2,479.20 (37.3)	367.89 (5.5)	6,648.08
2013	18.33 (0.2)	109.11 (1.5)	5,278.82 (71.9)	2,224.54 (30.3)	116.64 (1.6)	7,342.10
2014	19.45 (0.3)	1,124.00 (15.6)	4,787.22 (66.6)	2,329.02 (32.4)	147.36 (2.1)	7,188.09
2015	15.06 (0.2)	1,836.49 (19.4)	6,342.35 (67.1)	2,935.88 (31.0)	80.64 (0.9)	9,457.27

Notes:

- The data are based on DAC_CRS statistics.
- () are the rate (%) to the total each year.
- Includes aids for graduated countries.

Source: "ODA reference handbook 2016," Ministry of Foreign Affairs

Breakdown of Technical Aid (Number of persons)

	Accepted trainees	Dispatched experts	Dispatched Japan Overseas Cooperation Volunteers
2011	2,929	1,111	183
2012	6,756	2,912	173
2013	4,937	3,360	146
2014	3,391	3,159	84
2015	3,191	2,848	32

Note:

- The data are based on DAC_CRS statistics.
- "Dispatched Japan Overseas Cooperation Volunteers" include other volunteers such as Overseas cooperation senior volunteers and the like.
- "Accepted trainees" and "Dispatched experts" include numbers of persons who implemented projects through grants and contracts provided to public interest incorporated foundations and the like.

Source: "ODA reference handbook 2016," Ministry of Foreign Affairs