

## Environment

1. Data aggregation was performed in accordance with the Environment Accounting Guideline published by Japan's Ministry of the Environment

2. Companies covered: Business sites of consolidated companies are included in the total, but non-production sites (primarily the main building, sales offices, and other sites that perform managerial and administrative work and sites where GHG and environment impact are extremely low) are excluded.

3. Period : Apr 1 2018 to Mar 31 2019

### 1. Environment Conservation Cost

(Unit: Million yen)

Category	Main initiatives	FY2018	
		Investment	Cost
1) Environment conservation costs for curbing environment impact generated by production and service activities within business sites		3,702	18,879
Breakdown	i Environment conservation management costs: Measures against air pollution, water pollution, noise and vibration, etc.	1,524	11,130
	ii Global environment conservation costs: Cultivating company-owned forests in Japan, forest plantation operations outside Japan, energy conservation investments	995	520
	iii Resource circulation costs: Efficient utilization of resources, costs for waste measures	1,183	7,229
2) Costs for curbing environment impact generated upstream or downstream by production and service activities		0	270
	Costs for purchasing low-sulfur fuel (balance amount)		
3) Environment conservation cost related to administrative activities		7	873
	Employee education, ISO 14001 costs, costs for air and water analysis, costs for operating committees and other organizations, etc.		
4) Environment conservation costs related to R&D activities		356	2,164
	Product development that contributes to environment conservation by promoting utilization of recovered paper, curbing environment impact that occurs during production, etc.		
5) Environment conservation costs related to social activities		0	53
	Philanthropic programs, support for various environment groups, environment and sustainability reporting, Eco-Products exhibit, etc.		
6) Costs related to environment damage	Pollution impact levy (SO <sub>x</sub> )	0	543
Total		4,065	22,782

## 2. Economic benefit associated with environment conservation activities

Effect	FY2017	FY2018
Income from company-owned forests in Japan (million yen)	303	256
Income from company-owned forests in Japan (million yen)	1,756	1,468
Income from recycling (million yen)	3,338	3,562
Total	5,397	5,286

### 3. Greenhouse Gas (GHG) <sup>1)</sup>

		FY2014	FY2015	FY2016	FY2017	FY2018
Greenhouse Gas Emissions related to manufacturing ( kiloton-CO <sub>2</sub> e) <sup>2)</sup>		7,650	7,551	7,611	7,667	7,606
GHG Production intensity (kiloton-CO <sub>2</sub> e/production ton)		0.517	0.493	0.485	0.481	0.476
Percentage reduction from base year 2013		1.2%	5.7%	7.3%	8.0%	9.0%
Percentage reduction targeted (%)		1.7%	3.4%	5.0%	7.9%	8.7%
Scope 1 (Direct emissions)	Emission (kiloton-CO <sub>2</sub> e)	6,191	6,364	6,587	6,595	※6,394
	Intensity (t-CO <sub>2</sub> e/ Sales million yen)	4.595	4.439	4.575	4.439	4.123
Scope 2 (Indirect emissions)	Emission (kiloton-CO <sub>2</sub> e)	1,722	1,453	1,305	1,349	※1,442
	Intensity (t-CO <sub>2</sub> e/ Sales million yen)	1.278	1.013	0.906	0.899	0.930
Scope 1+2	Emission (kiloton-CO <sub>2</sub> e)	7,912	7,817	7,892	7,944	※7,836
	Intensity (t-CO <sub>2</sub> e/ Sales million yen)	5.873	5.453	5.481	5.347	5.052
Scope 1 breakdown by GHG type [kiloton CO <sub>2</sub> e]	CO <sub>2</sub>	6,989	6,809	6,850	6,932	6,832
	CH <sub>4</sub>	134	161	157	153	148
	N <sub>2</sub> O	790	847	885	859	856
	HCF	N.A.	N.A.	N.A.	N.A.	N.A.
	PFC	N.A.	N.A.	N.A.	N.A.	N.A.
	SF <sub>6</sub>	N.A.	N.A.	N.A.	N.A.	N.A.
	NF <sub>3</sub>	N.A.	N.A.	N.A.	N.A.	N.A.
Total		7,912	7,817	7,892	7,944	7,836

#### 1) Calculation of Greenhouse Gas (GHG) Emissions

GHG emissions in Japan are calculated based on Act on Rationalizing Energy Use (Energy Conservation Act), Act on Promotion of Global Warming Countermeasures (Global Warming Act), and base emissions factors of individual electric power companies.

GHG emissions overseas are based on IPCC 2006 Guidelines for National Greenhouse Gas Inventories and IEA CO<sub>2</sub> emission factors by country in 2010.

Emissions of carbon dioxide (CO<sub>2</sub>) generated in conjunction with the use of fossil fuels do not include emissions relating to the supply of electric power or heat to other companies.

Emissions from fuels derived from biomass (black liquor, wood, etc.) that are subject to the Global Warming Act are calculated.

Since unit calorific values for non-fossil fuels emphasize comparability to reduction targets, the factors set in the FY2013 reporting are used.

※Part of the results for fiscal 2018 have been assured by a third party.

#### 2) Calculation of greenhouse gas (GHG) emissions related to manufacturing

Emissions from the electric power business and transportation of products by company vehicles are not included

#### 4. Scope 3 (FY2018)

Category and Coverage	Emission (kiloton-CO <sub>2</sub> e)			Ratio (%)	Scope
	Domestic	Overseas	Total		
1 Purchased goods and services; - Emission from activities in producing raw materials, parts, purchased goods and sales materials	2,570	1,353	※3,923	71.8%	Consolidated
2 Capital goods; - Emission from building and producing capital goods of our companies	122	82	204	3.7%	Consolidated
3 Fuel-and-energy-related activities (not included in Scope 1 or 2); - Emission from purchasing fuel, electricity, heats and generating electricity	342	333	675	12.3%	Consolidated
4 Upstream transportation and distribution; - Emission from transportation and distribution of raw materials, parts, purchased goods and sales materials to our companies	261	147	408	7.5%	Consolidated
5 Waste generated in operations; - Emission from transportation and disposal of waste generated in our companies	19	61	80	1.5%	Consolidated
6 Business travel; - Emission from business travel of employees	2	2	5	0.1%	Consolidated
7 Employee commuting; - Emission from employees commuting	8	11	19	0.3%	Consolidated
8 Upstream leased assets <sup>1)</sup> ; - Emission from operation of leased assets that our companies leased (not included in Scope 1 or 2)	0	0	0	0.0%	Consolidated
9 Downstream transportation and distribution <sup>2)</sup> ; - Emission from operating leased assets that our companies leased	0	0	0	0.0%	Consolidated
10 Processing of sold products; - Emission from processing of intermediate products by business operators	153	0	153	2.8%	Consolidated
11 Use of sold products <sup>3)</sup> ; - Emission from use of products by users (consumers, business operators).	0	0	0	0.0%	
12 End of life treatment of sold products <sup>4)</sup> ; - Emission from transportation and disposal of products when disposing by users (consumers, business operators).	0	0	0	0.0%	
13 Downstream leased assets; - Emission from operating leased assets that our companies leased.	<0.1	0	<0.1	0.0%	
14 Franchises <sup>5)</sup> ; - Emission by franchises.	0	0	0	0.0%	
15 Investments <sup>6)</sup> ; - Emission related with investments management.	0	0	0	0.0%	
<b>Total</b>	<b>3,477</b>	<b>1,989</b>	<b>5,466</b>	<b>100.0%</b>	

※The total of purchased goods and services has been assured by a third party [on this page](#).

- 1) Calculated in Scope1, 2
- 2) Category 4 Includes transport, delivery (upstream).
- 3) Since the Group's main sales products, paper products, do not use energy during use, the Group considers that GHG emissions during product use are zero.
- 4) The Group's main sales products are paper products, which emit CO<sub>2</sub> when discarded. However, the Group's raw materials absorb CO<sub>2</sub> when grown, so the Group's emissions are offset and considered to be zero.
- 5) Since the Group is not the president of the franchise, the emissions sources falling under this category are considered to be zero.
- 6) Since the Group is not an investment or financial institution, zero emissions sources are considered to fall under this category.

## 5. Energy consumption<sup>1)</sup>

Segment	Breakdown	FY2014	FY2015	FY2016	FY2017	FY2018
Fuel type of using (Electric power equivalent GWh)	Oil	3,947	3,475	4,172	4,397	3,888
	Coal	8,032	8,536	8,456	8,388	8,164
	Gas	3,955	3,867	4,087	4,202	4,096
	Purchased energy	4,587	4,067	3,868	3,920	4,160
	Biomass	28,156	29,552	31,275	31,801	31,645
	Waste	7,916	8,165	8,445	8,564	8,626
	Hydro	346	296	326	324	397
	Solar	4	5	5	5	5
	Sub total	56,942	57,962	60,633	61,601	60,982
Total energy consumption (Crude Oil equivalent)	Consumption (Million liter)	5,655	5,637	5,789	5,874	※5,822
	Intensity (kilo-liter/production ton)	0.382	0.368	0.369	0.369	0.364
Production capacity by energy type (MW)	Thermal power <sup>2)</sup>				1,622	1,622
	Hydro power				72	72
	Solar power				4	4
Real power generation by energy type (GW h / yr.) <sup>3)</sup>	Thermal power				7,899	7,695
	Hydro power				324	397
	Solar power				5	5
Real power consumption (GWh / yr.)	Total power consumption				10,529	10,646
	Renewable energy power in total power consumption				3,926	3,936
	Purchased power from renewable energy <sup>4)</sup>				0	0
Biomass power generation companies						
Power generation capacity by type (MW)	Biomass power generation		51	51		
Energy input (electric power equivalent GWh)	Coal		10.0	1.0		
	Oil		0.3	0.3		
	Biomass		402.2	414.3		

### 1) Energy conversion

- Unit calorific values are calculated by using the following laws and international standards.  
 [Japan]: Act on Rationalizing Energy Use (Energy Conservation Act) and Act on Promotion of Global Warming Countermeasures (Global Warming Act).  
 The energy conversion of electric power from in-house hydropower generation uses 3.6 GJ per 1,000 kWh.  
 [Overseas]: IPCC 2006 Guidelines for National Greenhouse Gas Inventories
- Consumption relating to the electric power business (supply of electricity or heat to other companies) and transport by Group-owned vehicles is excluded.
- Energy relating to the supply of electric power or heat to other companies is excluded from fossil fuel and non-fossil fuel derived energy.
- Since unit calorific values for non-fossil fuels emphasize comparability to reduction targets, the factors set in the FY2013 reporting are used.

### 2) Thermal Power Generation by the Group

Thermal power generation includes power generation capacity of spare facilities. Thermal power generation refers to the sum of Oil and Coal, Biomass, Wastes burning alone and mixed burning.

### 3) Performance of the Group's Power Generation

The total amount of electricity consumed and sold in-house is shown in the figure.

### 4) Enter the amount of purchased electricity that can be proved to be derived from renewable energy, such as the Green Power Certification.

※The consumption for fiscal 2018 has been assured by a third party on this page.

## 6. Acquisition status of environment management system (EMS)

Segment	As of March 31, 2018	As of March 31, 2019
Number of sites covered by ISO14001	128.0	136.0
Percentage of sites covered by ISO14001 (%) *	94.1	97.1

\* In Oji Group, 219 worksites are promoting to obtain ISO 14001 and 181 worksites have obtained ISO 14001 certification.

## 7. Environmental fines and penalties

	FY2017	FY2018
Environmental fines and penalties (yen)	0 (No occurrence)	0 (No occurrence)

\* Environment-related is violation of environmental laws and regulations such as water intake, drainage, air, waste, etc.

## 8. Environmental burden substances (BOD, COD, and SS) in wastewater and drainage amount

[Target] Improve emission intensity of pollution materials more than 1% compared with the previous year							
Segment		FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
BOD emission (ton)		9,365	7,971	8,504	7,913	7,860	
Emission intensity	(ton/ production ton)	0.63	0.52	0.54	0.50	0.49	
	(kg/million yen)	6.95	5.56	5.91	5.33	5.07	
Year-on-year improvement rate evaluation (Goal)		×	○	×	○	○ -4.9%	(Reduced by 1% or more compared to the previous year)
COD emission (ton)		37,348	34,784	34,719	35,215	34,932	
Emission intensity	(ton/ production ton)	2.52	2.27	2.21	2.21	2.19	
	(kg/million yen)	27.72	24.26	24.11	23.70	22.52	
Year-on-year improvement rate evaluation (Goal)		×	○	×	○	○ -5.0%	(Reduced by 1% or more compared to the previous year)
SS emission (ton)		15,337	14,847	14,643	14,943	14,829	
Emission intensity	(ton/ production ton)	1.04	0.97	0.93	0.94	0.93	
	(kg/million yen)	11.38	10.36	10.17	10.06	9.56	
Year-on-year, improvement rate evaluation (Goal)		○	○	○	○	○ -5.0%	(Reduced by 1% or more compared to the previous year)
Wastewater amount (kilo m <sup>3</sup> )		716,726	714,508	715,796	716,790	708,491	
Drainage destination	River and lake	288,216	284,400	285,278	285,470	280,690	
	Sea	363,355	361,834	357,688	358,113	354,651	
	Sewer	65,156	68,274	72,830	73,206	73,150	

BOD; Biochemical oxygen demand, COD; Chemical oxygen demand, SS; Suspended solids

Data of pollution material covers all consolidated companies that be regulated with wastewater.

## 9. Amount of environment burden substances in emitted gas

Segment		FY2014	FY2015	FY2016	FY2017	FY2018	FY2018
<b>[Goal] Improve intensity of SOX emission more than 1% compared with the previous year</b>							
SOx emission (ton)		6,639	6,729	7,107	6,435	6,394	
Emission intensity	(kg/production ton)	0.45	0.44	0.45	0.40	0.40	
	(kg/million yen)	4.93	4.69	4.94	4.33	4.12	
Year on year improvement rate achievement (Goal)		○	○	×	○	○ -4.8%	(Reduced by 1% or more compared to the previous year)
NOx emission (ton)		9,888	10,617	11,093	11,206	10,834	
Emission intensity	(kg/production ton)	0.67	0.69	0.71	0.70	0.68	
	(kg/million yen)	7.34	7.41	7.70	7.54	6.99	
Dust emission (ton)		3,504	2,940	2,893	3,135	2,944	
Emission intensity	(kg/production ton)	0.24	0.19	0.18	0.20	0.18	
	(kg/million yen)	2.60	2.05	2.01	2.11	1.90	
<b>[Goal] Reduce VOC emissions per unit of production to less than the 2010 unit (0.56).</b>							
VOC emission (ton)		558	499	566	524	476	
Emission intensity	(kg/production ton)	0.06	0.05	0.06	0.05	0.05	
	(kg/million yen)	0.41	0.35	0.39	0.35	0.31	
Year on year improvement rate achievement (Goal)		○	○	○	○	○	(Reduced by less than 0.56 to FY2010)

Environmentally hazardous substance content in the emitted gas

- Data of SOx, NOx and Dust cover all consolidated companies that be regulated.
- VOC Emission data cover all consolidated companies that submit PRTR

## 10. Waste and PRTR Chemical Substances

Segment		FY2014	FY2015	FY2016	FY2017	FY2018
Industrial waste generation <sup>1)</sup>	Domestic ( kiloton)	1,544	1,517	1,484	1,494	1,517
	Overseas ( kiloton)	1,177	1,202	1,279	1,288	1,358
	Total ( kiloton)	2,721	2,719	2,762	2,782	※2,875
Generation intensity	(kg/production ton)	183.9	177.7	176.0	174.7	180.0
	(kg/million yen)	2,020	1,896	1,919	1,872	1,854
Efficient use amount ( kiloton)		2,552	2,563	2,618	2,617	2,708
Landfill amount (Final disposal amount)	Domestic ( kiloton)	46	45	32	25	25
	Overseas ( kiloton)	124	110	112	140	141
	Total ( kiloton)	170	155	144	165	166
Landfill intensity	(kg/production ton)	11.5	10.1	9.2	10.4	10.4
	(kg/million yen)	126	108	100	111	107
<b>[Goal] Domestic 99% or more, Overseas 95% or more by FY2020</b>						
Efficient use ratio	Domestic (%)	97.0	97.0	97.9	98.3	98.3
	Overseas (%)	89.5	90.8	91.2	89.1	89.6
Hazardous waste generation amount (ton)			28,623	25,115	23,252	14,059
Generation intensity	(kg/production ton)		1.87	1.60	1.46	0.88
	(kg/million yen)		20	17	16	9
PRTR Chemical substance released amount and transferred amount <sup>2)</sup>		876	815	842	826	787
Released and transferred intensity	(kg/production ton)	89.0	82.6	85.2	82.2	77.7
	(kg/million yen)	0.65	0.57	0.59	0.56	0.51

1) The amount of industrial waste generated includes the amount of valuable resources.

※The total of industrial waste generated in 2018 has been assured by a third party [on this page](#).

2) PRTR Data covers Oji Group facilities ( Consolidated ) that submit PRTR



## 11 . Release and Transfer of PRTR Chemical Substances in domestic FY 2018

Scope of data calculation below are consolidated basis. If different, we added notices.

Segment	Handled amount including generated amount	Released amount	Transferred amount	Total release and transfer
Zinc compounds (water-soluble) (ton)	11.5	2.2	0.9	3.1
Acrylic acid and its water-soluble salts (ton)	1.3	-	0.02	0.02
2-Hydroxyethyl Acrylate (ton)	2.9	-	-	-
n-Butyl Acrylate (ton)	10.5	0.6	0.1	0.7
Methyl acrylate (ton)	8.6	0.5	0.04	0.5
2-Aminoethanol (ton)	16.1	0.002	0.2	0.2
Asbestos (ton)	1.4	-	1.4	1.4
Isoprene (ton)	10.3	0.1	-	0.1
Ethylbenzene (ton)	6.5	0.1	0.2	0.3
Ethylene oxide (ton)	1.4	0.01	-	0.01
Ferric chloride (ton)	111.7	-	-	-
Xylene (ton)	38.1	0.4	0.6	1.0
Chromium and trivalent chromium compounds (ton)	17.5	0.007	0.003	0.01
Chloroform (ton)	14.4	14.3	-	14.3
Vinyl acetate (ton)	475.6	2.1	0.7	2.8
Cyclohexylamine (ton)	1.1	1.1	-	1.1
2,2-Dibromo-2-cyanoacetamide (ton)	60.6	27.9	0.2	28.1
Styrene 8ton)	107.7	0.01	0.1	0.1
Dioxins (mg -TEQ)	777.9	302.4	475.5	777.9
Decanoic acid 8ton)	7.9	0.06	-	0.06
Sodium dodecyl sulfate 8ton)	3.7	2.2	-	2.2
1,2,4-Trimethylbenzene (ton)	27.1	0.1	0.02	0.1
Toluene (ton)	2,732.9	474.0	192.0	666.0
Hexamethylene diacrylate (ton)	2.7	-	-	-
Nickel (ton)	16.8	0.01	0.01	0.02
Methyl 4-hydroxybenzoate (ton)	1.0	0.2	0.06	0.3
N-Vinylpyrrolidone (ton)	2.5	-	-	-
Phenol (ton)	5.3	0.01	0.2	0.2
Hydrogen fluoride and its water-soluble salts (ton)	1.6	1.6	-	1.6
1-bromopropane (ton)	3.2	3.0	0.2	3.2
n-Hexane 8ton)	15.7	0.5	0.2	0.7
Benzene (ton)	31.9	29.8	-	29.8
Boron compounds (ton)	228.9	11.2	1.3	12.5
Poly(oxyethylene) alkyl ether(alkyl C=12-15) (ton)	7.0	1.7	0.2	1.8
Sodium poly(oxyethylene) dodecyl ether sulfate (ton)	6.2	4.2	-	4.2
Formaldehyde 8ton)	1.6	0.8	0.03	0.9
Manganese and its compounds (tn)	9.3	8.1	-	8.1
Methylnaphthalene (ton)	292.0	1.4	-	1.4
Methylenebis(4.1-phenylene) = diisocyanate (ton)	1.8	-	-	-
<b>Total</b>	<b>4,296</b>	<b>588</b>	<b>199</b>	<b>787</b>

- Data covers Oji Group facilities ( Consolidated ) that submit PRTR
- Excluding dioxins, numbers prepared for substances of which one ton or more (0.5 tons or more Specified Class 1 Designated Chemical Substances) is handled ( including amount produced).

## 12. Usage of main raw materials※

Main raw materials	FY2014	FY2015	FY2016	FY2017	FY2018
Woodchip and lumber (kilo ton)	10,613	12,545	13,089	13,337	13,432
Recovered paper (kilo ton)	4,666	4,300	4,329	4,367	4,343
Pulp (kilo ton)	406	288	325	358	341
Purchased containerboard and corrugated sheet (kilo ton)	3,027	2,941	2,994	3,069	3,309
<b>Total (kilo ton)</b>	<b>18,712</b>	<b>20,073</b>	<b>20,738</b>	<b>21,130</b>	<b>21,425</b>

Amount includes intra-group transaction

## 13. Water Resource

Segment	FY2014	FY2015	FY2016	FY2016	FY2018	FY2019
<b>[Goal] Improve intensity of water used 1% or more compared with the previous year</b>						
Water intake (kilo m <sup>3</sup> )	742,705	750,447	743,683	744,606	740,889	
Water intensity	(kilo m <sup>3</sup> / production ton)	50.2	49.0	47.4	46.8	46.4
	(m <sup>3</sup> / million yen)	551.3	523.5	516.5	501.1	477.7
Year on year improvement rate achievement (Goal)	×	○	○	○	○ -4.7%	(Reduced by 1% or more compared to the previous year)
Breakdown of water intake (kilo m <sup>3</sup> )	Surface water(river, lake, sea, brackish water)	436,638	440,475	436,914	436,108	439,262
	Groundwater(well water, subsoil water)	156,658	148,509	150,227	150,091	151,295
	Third party organization (water supply, city water)	149,408	161,463	156,542	158,408	150,332
	<b>Total</b>	<b>742,705</b>	<b>750,447</b>	<b>743,683</b>	<b>744,606</b>	<b>740,889</b>
Recycled water amount (kilo m <sup>3</sup> )	668,215	677,417	701,967	690,839	685,727	
Recycled ratio (%)	90%	90%	94%	93%	93%	

## 14. Water intensity in Electric Power Business 1)

	FY2014	FY2015	FY2016	FY2017	FY2018
Gross generation (千kWh)	6,685	238,880	410,896	412,587	415,631
Water intake (m <sup>3</sup> )	79,762	991,274	1,516,012	1,560,392	1,537,505
Water intensity (m <sup>3</sup> /千kWh)	11.93	4.15	3.69	3.78	3.70

1) Electric power companies (Oji Green Energy Nichinan Co. Ltd, Oji Green Energy Ebetsu Co., Ltd.)

## 15. Paper recycle※

Segment	FY2014	FY2015	FY2016	FY2017	FY2018
Recycled amount (kilo ton)	4,073	4,029	4,066	4,093	4,081
Recycled rate (%)	64.3%	64.3%	63.5%	64.0%	64.0%

※ Scope of Paper recycle : Oji Paper, Oji Materia, Oji F-Tex, Oji Nepia

## 16. Environment-related data by segment

### Domestic and overseas environmental burden data (FY 2018)

	Operating sites	Production kilo ton	GHG		Water resource		Industrial waste		Domestic chemical substances		Environmental burden in wastewater			Environmental burden in emission gas		
			Emission (kilo-CO <sub>2</sub> )	Intensity	Water withdrawal	Intensity	Final disposal amount	Intensity	PRTR chemical substances	Intensity	BOD	COD	SS	SOx (SO <sub>2</sub> conversion)	NOx (NO <sub>2</sub> conversion)	Dust
			Kilo ton	t CO <sub>2</sub> e/production ton	kilo m <sup>3</sup>	kilo m <sup>3</sup> /production ton	Appearance ton	kg/production ton	Released and transferred amount ton	g/production ton	ton	ton	ton	ton	ton	ton
Industrial Material Business	161	6,595	3,126	0.474	191,294	29.0	16,896	2.6	134	24	3,286	3,947	2,622	2,440	3,261	153
Household and Consumer Product Business	7	217	35	0.161	4,062	18.7	52	0.2	(*1)	(*1)	(*1)	<1	46	<1	4	294
Functional Materials Business	27	799	685	0.857	59,979	75.1	4,897	6.1	588	1,237	1,243	177	1,004	1,081	495	57
Forest Resources and Environment Marketing Business	37	3,563	455	0.128	63,191	17.7	36,250	10.2	<1	<1	1,485	11,026	575	297	259	1,387
Printing and Communications Media Business	7	3,626	2,961	0.817	366,604	101.1	19,536	5.4	52	18	902	19,599	8,921	2,576	6,178	303
Other business	46	1,172	489	0.417	55,759	47.6	88,609	75.6	14	702	944	<1	1,661	<1	639	750
<b>Total (consolidated subsidiary)</b>	<b>285</b>	<b>15,972</b>	<b>7,751</b>	<b>0.485</b>	<b>740,889</b>	<b>46.4</b>	<b>166,240</b>	<b>10.4</b>	<b>788</b>	<b>78</b>	<b>7,860</b>	<b>34,749</b>	<b>14,829</b>	<b>6,394</b>	<b>10,834</b>	<b>2,944</b>

• Production volume includes the volume of transactions within the group.

• Greenhouse gas emissions are calculated under the following conditions.

① Emission factors in the following laws and international standards are used.

[Japan]: Act on Rationalizing Energy Use (Energy Conservation Act), Act on Promotion of Global Warming Countermeasures (Global Warming Act), and base emissions factors of individual electric power companies.

[Overseas]: IPCC 2006 Guidelines for National Greenhouse Gas Inventories and IEA CO<sub>2</sub> emission factors by country in 2010.

② Emissions relating to transport of products, etc. by Group-owned vehicles are not included.

③ Emissions of carbon dioxide (CO<sub>2</sub>) generated in conjunction with the use of fossil fuels do not include emissions relating to the supply of electric power or heat to other companies.

④ Emissions from fuels derived from biomass (black liquor, wood, etc.) that are subject to the Global Warming Act are calculated.

⑤ Since unit calorific values for non-fossil fuels emphasize comparability to reduction targets, the factors set in the FY2013 reporting are used.

• The environmental impact (BOD, COD, SS) of water emissions and the environmental impact (SOx, NOx, soot and dust) of air emissions are the amounts of emissions from business sites to which regulations are applied.

NOTE: (\*1) Emissions not listed because there are no sites where regulations are applied.

**17 . The Oji Group's forest area, forest certification acquisition rate, and CO<sub>2</sub> absorption and fixation through sustainable forest management.**

As of March 2019

	Area (kilo ha)	Forest certification acquisition	CO <sub>2</sub> fixed amount ** (kilo CO <sub>2</sub> ton)
Overseas Forest Plantations	255	85%	82,126
Company-owned Forests in Japan	188	100%*	38,690
<b>Total</b>	<b>443</b>		<b>120,816</b>

\* : Excluding profit-sharing forests, 173 kilo hectares of our forests in Japan, have acquired SGEN forest certification.

\*\* : CO<sub>2</sub> fixed amount (CO<sub>2</sub> ton) = Merchantable volume with bark (m<sup>3</sup>) x Biomass expansion factor (1.7) x Bulk density (BDT/ m<sup>3</sup>) x Carbon fraction of dray mater (0.5) x CO<sub>2</sub> conversion factor (44/12). BDT: Bone Dry Ton

**18. Forest plantation business**

As of March 2019

Plantation company (Area and country)	Year established	Planted area (ha)	Remarks Forest certification code
Southland Plantation Forest Co. of New Zealand Ltd. (SPFL) (South Island, New Zealand)	1992	8,630	<a href="https://www.spfl.co.nz/">https://www.spfl.co.nz/</a> FSC®C008418
Albany Planation Forest Co. of Australia Pty Ltd. (APFL) (Western Australia, Australia)	1993	9,139	<a href="http://www.albanyplantations.com.au/#">http://www.albanyplantations.com.au/#</a>
Quy Nhon Plantation Forest Co. of Vietnam Ltd. (QPFL) (Bin Dinh pro, Vietnam)	1995	9,416	FSC®C016623
Green Triangle Plantation Forest Co. of Australia Pty. Ltd. (GPFL) (Victoria, Australia)	1997	3,426	
Huizhou Nanyou Forest Development Co., Ltd. (KPFL) (Huizhou, China)	2002	4,234	
PT Korintiga Hutani (KTH) (Kalimantan, Indonesia)	1998	36,459	AJA/IFCC-PEFC/FMC-HT/00038/I/2018
Truong Thanh Oji Plantation Forest Company Limited (TTO) (Phu Yen, Vietnam)	2011	2,290	
Celulose Nipo-Brasileira S.A (CENIBRA) (Minas Gerais, Brazil)	1973	146,533	<a href="http://www.cenibra.com.br/">http://www.cenibra.com.br/</a> FSC®C008495
Pan Pac Forest Products Ltd (PAN PAC) (North island, New Zealand)	1971	34,749	<a href="https://www.panpac.co.nz/">https://www.panpac.co.nz/</a> FSC®C017103
<b>Total (ha)</b>		<b>254,876</b>	

**19 . The procurement composition of wood chips**

As of March 2019

	Procurement volume		Hardwood (%)	Softwood (%)	
	(kilo BDT*)	(%)			
Imported wood chips	4,095	80%	70%	10%	
Domestic wood chips	1,015	20%	4%	16%	
<b>Total</b>	<b>5,110</b>	<b>100%</b>	<b>74%</b>	<b>26%</b>	

\*BDT: Bone Dry Ton