



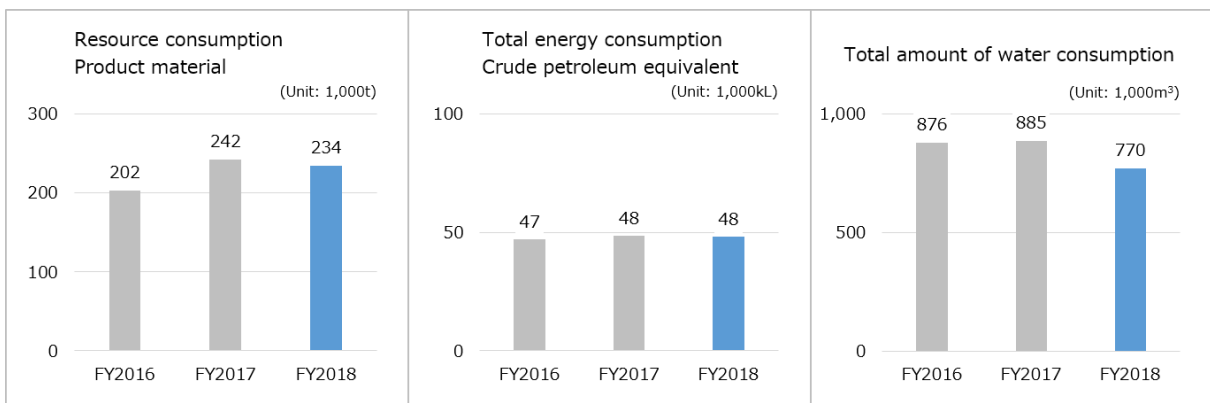
## Material Balance

### Identifying the environmental impact of business operations

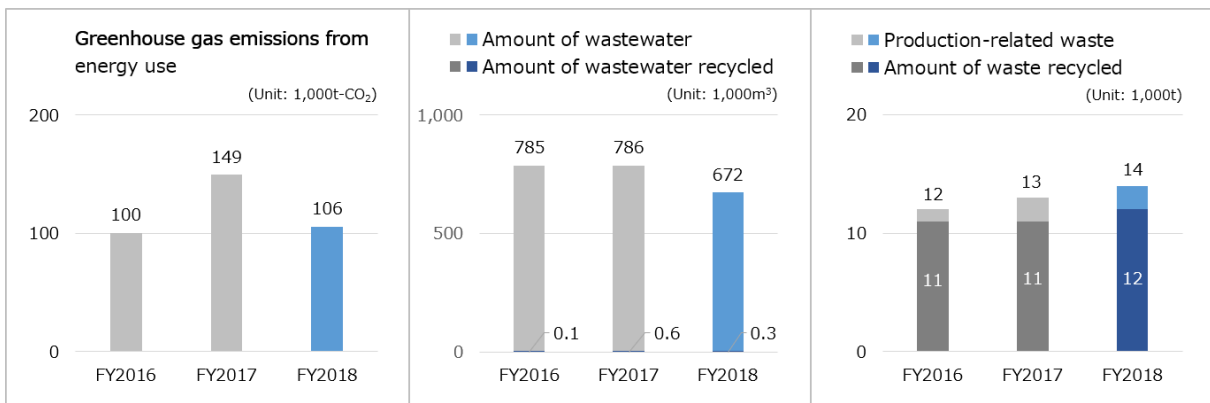
The Brother Group facilities are engaged in processing and assembly to manufacture products. The environmental impacts (including resource consumption, CO<sub>2</sub> emissions, and waste generated) associated with all business operations are quantitatively monitored and summarized to reduce environmental impacts.

## Input of Resources, Production & Emission of Substances between FY2016 and FY2018

### Resource and energy inputs



### Production & Emission of Substances



**Water-related data of main business sites between FY2016 and FY2018**

**Water intake, Amount of wastewater, Amount of recycled water**

		<b>FY2016</b>	<b>FY2017</b>	<b>FY2018</b>
<b>Water intake (m<sup>3</sup>)</b>	<b>Clean water</b>	781,998	786,318	669,888
	<b>Industrial water</b>	8,668	0	0
	<b>Under-ground water</b>	85,769	98,842	99,816
<b>Amount of wastewater (m<sup>3</sup>)</b>	<b>River</b>	317,647	259,441	223,764
	<b>Sewer system</b>	467,564	526,403	448,096
	<b>Others</b>	223	423	422
<b>Amount of recycled water (m<sup>3</sup>)</b>		90	552	288
<b>Rate of recycled water (%)</b>		0.0	0.1	0.0

The scope of aggregation was directly related to the product range.

**Water pollution load**

		<b>FY2016</b>	<b>FY2017</b>	<b>FY2018</b>
<b>Water pollution load (t)</b>	<b>BOD</b>	18.0	39.1	11.0
	<b>COD</b>	40.4	68.1	28.6
	<b>n-hexane</b>	0.6	1.2	0.7
	<b>SS</b>	44.0	24.9	57.4

The scope of aggregation was directly related to the product range.

## Input of Resources, Production & Emission of Substances in FY2018

### Resource and energy inputs in FY2018

Resource consumption		Total energy consumption		Water consumption	
Product material (t)	233,908	Crude petroleum equivalent (kL)	47,983	Total amount of water consumption (m <sup>3</sup> )	769,704

### Production & Emission of Substances in FY2018

CO2 emissions		Amount of wastewater		Amount of waste	
Greenhouse gas emissions from energy use (t-CO <sub>2</sub> )	105,677	Amount of wastewater (m <sup>3</sup> )	672,282	Production-related waste (t)	14,168
		Amount of wastewater recycled (m <sup>3</sup> )	288	Amount of waste recycled (t)	12,113
		Recycling rate (%)	0.0	Rate of landfill (%)	0.94

The scope of aggregation was directly related to the product range.

### Calculation method

Resource and energy inputs in FY2018		
Resource consumption	The resource consumption is calculated by multiplying the shipments to major products shipped in FY2018 per weight.	
Total energy consumption	Total amount of electricity, gasoline, light oil, LPG, city gas, etc. consumed at target business sites in FY2018	
	Crude petroleum equivalent	Total amount of electricity, gasoline, light oil, LPG, city gas, etc. consumed at target business sites in FY2018 *: The conversion rate for crude oil equivalent is based on the Appended Table 1 of the Ordinance for Enforcement of the Act on the Rational Use of Energy enacted by the Japanese Ministry of Economy, Trade and Industry.
Water consumption	Total amount of water consumed at target business sites in FY2018	
	Clean water・Industrial water・Underground water	Measurement using a water meter

### Production and emission of substances in FY2018

CO <sub>2</sub> emission	Based on the Brother Group Mid-term Environmental Action Plan 2018 (2016~2018) Calculated based on the location-based method (using the grid-average emission factors in a certain area such as a country or region) *: The sources of emission factors for the location-based method are as follows: <ul style="list-style-type: none"> <li>・IEA - CO2 EMISSIONS FROM FUEL COMBUSTION 2016 edition</li> <li>・GHG Protocol - Calculation tools</li> <li>・DEFRA</li> </ul>
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Amount of wastewater	The amount is equivalent to the amount of water intake. However, the amount is calculated based on the measured wastewater amount or in accordance with the formula set in respective regions (based on the amount of water intake), if such measured amount or formula is available.	
Amount of waste	Production-related waste	Total amount of waste (including metals, waste plastics, circuit boards, sludge, waste oil/solvents, waste acids/alkalis, glass/ceramics, and batteries) generated in the production process at target business sites in FY2018

Environmental impact data for before FY2016 is available on the CSR Report PDF Download page.

**Environmental impact data of main business sites in FY2018**

**Resource consumption, Energy consumption**

Name of site	Resource consumption (t)	Energy consumption					
		Electricity (MWh)	LPG (t)	City gas (1,000m <sup>3</sup> )	Gasoline (kL)	Light oil (kL)	Kerosene (kL)
Eight business sites in Japan (head office of Brother Industries, Ltd., Mizuho Manufacturing Facility, Hoshizaki Manufacturing Facility, Minato Manufacturing Facility, * Momozono Manufacturing Facility, Kariya Manufacturing Facility, Research & Development Center, Logistics Center)	21,367	36,686	0	801	41	3	0
Nissei Corporation	8834	31,084	15	2,087	32	3	3
Mie Brother Precision Industries, Ltd.	236	551	0	0	2	0	0
Brother Industries (U.K.) Ltd.	449	1,313	0	62	1	1	0
Brother Industries (Slovakia) s.r.o.	876	600	0	64	0	10	0
Taiwan Brother Industries, Ltd.	1,511	1,895	4	0	0	0	0
Zhuhai Brother Industries, Co., Ltd.	6,452	2,648	0	0	5	5	0
Brother Machinery Xian Co., Ltd.	8,978	10,571	0	325	0.2	2	0
Brother Technology (Shenzhen) Ltd.	44,218	21,808	0	352	118	45	0
Brother Industries (Philippines), Inc.	29,382	23,794	41	0	0.5	0.1	0
Brother Industries (Vietnam) Ltd.	91,323	28,999	103	0	0	32	0
Brother Machinery Vietnam Co., Ltd.	2,410	3,283	165	0	0	4	0
Brother Industries Saigon, Ltd	12,885	3,861	0	0	0.2	0.7	0

\* : The Minato Manufacturing Facility stopped production on September 30, 2017.

### Energy-derived greenhouse gas emissions

Name of site	Energy-derived greenhouse gas emissions (t-CO <sub>2</sub> )		
	Scope 1	Scope 2	
		Location-based	Market-based
Eight business sites in Japan (head office of Brother Industries, Ltd., Mizuho Manufacturing Facility, Hoshizaki Manufacturing Facility, Minato Manufacturing Facility, * Momozono Manufacturing Facility, Kariya Manufacturing Facility, Research & Development Center, Logistics Center)	1,615	19,810	17,793
Nissei Corporation	4,081	16,785	15,076
Mie Brother Precision Industries, Ltd.	4	298	267
Brother Industries (U.K.) Ltd.	123	458	523
Brother Industries (Slovakia) s.r.o.	166	101	0
Taiwan Brother Industries, Ltd.	12	1,105	1,002
Zhuhai Brother Industries, Co., Ltd.	24	1,740	1,740
Zhuhai Brother Industries, Co., Ltd.	621	6,945	6,945
Brother Technology (Shenzhen) Ltd.	3,050	14,328	14,328
Brother Industries (Philippines), Inc.	125	14,609	22,521
Brother Industries (Vietnam) Ltd.	1,820	13,920	13,920
Brother Machinery Vietnam Co., Ltd.	505	1,576	1,576
Brother Industries Saigon, Ltd	2	1,854	1,854

\* : The Minato Manufacturing Facility stopped production on September 30, 2017.

**Water intake, Amount of wastewater, Amount of recycled water**

Name of site	Water intake (m <sup>3</sup> )			Amount of wastewater (m <sup>3</sup> )			Amount of recycled water (m <sup>3</sup> )	Rate of recycled water (%)
	Clean water	Industrial water	Underground water	River	Sewer system	Others		
Eight business sites in Japan (head office of Brother Industries, Ltd., Mizuho Manufacturing Facility, Hoshizaki Manufacturing Facility, Minato Manufacturing Facility, * Momozono Manufacturing Facility, Research & Development Center, Logistics Center)	73,623	0	0	0	72,060	136	0	0.0
Eight business sites in Japan (Manufacturing Facility, Kariya)	18,642	0	0	18,642	0	0	0	0.0
Nissei Corporation	78,217	0	0	0	21,248	0	0	0.0
Mie Brother Precision Industries, Ltd.	50	0	1,342	1,392	0	0	0	0.0
Brother Industries (U.K.) Ltd.	1,819	0	0	0	1,819	0	0	0.0
Brother Industries (Slovakia) s.r.o.	0	0	2,551	0	2,551	0	0	0.0
Taiwan Brother Industries, Ltd.	10,699	0	0	0	8,839	0	0	0.0
Zhuhai Brother Industries, Co., Ltd.	69,863	0	0	0	62,877	0	0	0.0
Brother Machinery Xian Co., Ltd.	29,900	0	0	0	23,394	0	0	0.0
Brother Technology (Shenzhen) Ltd.: Baolong Manufacturing Facility	141,489	0	0	0	141,489	0	270	0.2
Brother Technology (Shenzhen) Ltd.: Nanwan Manufacturing Facility	52,159	0	0	52,159	0	0	0	0.0
Brother Industries (Philippines), Inc.	0	0	95,923	0	81,535	0	0	0.0
Brother Industries (Vietnam) Ltd.	151,571	0	0	151,571	0	0	0	0.0
Brother Machinery Vietnam Co., Ltd.	12,168	0	0	0	8,534	286	18	0.1
Brother Industries Saigon, Ltd	29,688	0	0	0	23,750	0	0	0.0

\* : The Minato Manufacturing Facility stopped production on September 30, 2017.

### Water pollution load

Name of site	Water pollution load (mg/L)			
	BOD	COD	n-hexane	SS
Eight business sites in Japan (Hoshizaki Manufacturing Facility)	165.0	–	6.5	–
Eight business sites in Japan (Kariya Manufacturing Facility)	1.3	9.7	–	–
Eight business sites in Japan (Logistics Center)	10.9	–	1.0	–
Nissei Corporation	54.9	4.3	0.7	3.9
Mie Brother Precision Industries, Ltd.	2.0	9.0	–	9.0
Brother Industries (U.K.) Ltd.	–	–	–	–
Brother Industries (Slovakia) s.r.o.	2.7	14.4	–	3.8
Taiwan Brother Industries, Ltd.	7.3	28.7	–	3.7
Zhuhai Brother Industries, Co., Ltd.	8.5	34.5	–	28.0
Brother Machinery Xian Co., Ltd.	9.0	53.5	0.8	9.7
Brother Technology (Shenzhen) Ltd.: Baolong Manufacturing Facility	19.4	67.0	0.9	117.0
Brother Technology (Shenzhen) Ltd.: Nanwan Manufacturing Facility	5.4	23.0	0.1	39.0
Brother Industries (Philippines), Inc.	27.2	66.3	1.7	20.3
Brother Industries (Vietnam) Ltd.	19.0	29.2	–	–
Brother Machinery Vietnam Co., Ltd.	5.0	12.0	1.0	6.0
Brother Industries Saigon, Ltd	73.0	161.0	–	–



### Waste amount

Name of site	Waste amount						
	Production-related waste (t)	Material recycling (t)	Thermal recycling (t)	Incineration amount (t)	Other disposal amount (t)	Amount of landfill waste (t)	Rate of landfill waste (%)
Eight business sites in Japan (head office of Brother Industries, Ltd., Mizuho Manufacturing Facility, Hoshizaki Manufacturing Facility, Minato Manufacturing Facility, * Momozono Manufacturing Facility, Kariya Manufacturing Facility, Research & Development Center, Logistics Center)	1,916	1,709	170	37	0	0	0
Nissei Corporation	3,481	2,541	939	0	0	0	0
Mie Brother Precision Industries, Ltd.	88	68	20	0	0	0	0
Brother Industries (U.K.) Ltd.	253	243	10	0	0	0	0
Brother Industries (Slovakia) s.r.o.	570	486	81	2	0	0	0
Taiwan Brother Industries, Ltd.	821	20	0	55	746	0	0
Zhuhai Brother Industries, Co., Ltd.	210	174	0	31	3	1	0
Brother Machinery Xian Co., Ltd.	572	397	0	105	70	0	0
Brother Technology (Shenzhen) Ltd.	715	597	113	0	5	0	0
Brother Industries (Philippines), Inc.	1,461	1,317	0	0	0	123	8
Brother Industries (Vietnam) Ltd.	3,136	2,761	0	375	0	0	0
Brother Machinery Vietnam Co., Ltd.	576	89	32	54	391	10	2
Brother Industries Saigon, Ltd	370	345	0	25	0	0	0

To help use resources effectively and prevent resource depletion, the Brother Group ensures activities are carried out to curb waste generation, reduce emissions, and achieve "zero landfill waste" (meaning that less than 1% of waste generated at factories is sent to landfill).

\* : The Minato Manufacturing Facility stopped production on September 30, 2017.

**Location/Main line of business**

Name of site	Location	Main line of business (as of March 31, 2019)
Eight business sites in Japan (head office of Brother Industries, Ltd., Mizuho Manufacturing Facility, Hoshizaki Manufacturing Facility, Minato Manufacturing Facility, * Momozono Manufacturing Facility, Kariya Manufacturing Facility, Research & Development Center, Logistics Center)	Nagoya, Aichi Prefecture (various locations)	[Mizuho Manufacturing Facility] Research and development of telecommunication/printing equipment, electronic stationery, and home sewing machines [Hoshizaki Manufacturing Facility] Prototype production of printer heads [Momozono Manufacturing Facility, Research & Development Center] Research and development [Kariya Manufacturing Facility] Production of electronic stationery, garment printers, and machine tools
Nissei Corporation	Anjo, Aichi Prefecture	Manufacture and sales of speed reducers, small gears, and die-cast products; and lease of real estate properties (including condominiums)
Mie Brother Precision Industries, Ltd.	Taki-gun, Mie Prefecture	Production of consumables for karaoke systems for business use, mobile printers, electronic stationery, etc., recycling of toner cartridges, and product repair services
Brother Industries (U.K.) Ltd.	Wales, U.K.	Production of consumables for printers, All-in-Ones, etc.
Brother Industries (Slovakia) s.r.o.	Krupina, Slovakia	Production of consumables for printers, All-in-Ones, etc.
Taiwan Brother Industries, Ltd.	Kaohsiung, Taiwan	Production of home sewing machines
Zhuhai Brother Industries, Co., Ltd.	Guangdong, China	Production of electronic stationery, scanners, industrial printing equipment, etc.
Brother Machinery Xian Co., Ltd.	Shaanxi, China	Production of industrial sewing machines and machine tools
Brother Technology (Shenzhen) Ltd.: Baolong Manufacturing Facility, Nanwan Manufacturing Facility	Guangdong, China	Production of printers and All-in-Ones
Brother Industries (Philippines), Inc.	Batangas, the Philippines	Production of printers, All-in-Ones, and electronic stationery
Brother Industries (Vietnam) Ltd.	Hai Duong Province, Vietnam	Production of printers and All-in-Ones

Brother Machinery Vietnam Co., Ltd.	Hai Duong Province, Vietnam	Production of industrial sewing machines
Brother Industries Saigon, Ltd	Dong Nai Province, Vietnam	Production of home sewing machines

\* : The Minato Manufacturing Facility stopped production on September 30, 2017.