



Material Balance

Identifying the environmental impact of business operations

The Brother Group's manufacturing facilities are engaged in processing and assembly to manufacture products. The environmental impacts (including resource consumption, CO₂ emissions, and waste generated) associated with all business operations are quantitatively monitored and summarized to reduce environmental impacts.

Resource Utilization and Material Production/Emissions in FY2021 (April 1, 2021–March 31, 2022)

Resource and energy inputs in FY2021

Resource consumption		Total energy consumption		Water consumption	
Product raw materials (t)	208,168	Crude petroleum equivalent (kL)	47,564	Total amount of water consumption (m ³)	617,863

Material production/emissions in FY2021

Greenhouse gas emissions		Wastewater volume		Amount of waste	
Greenhouse gas emissions (t-CO ₂ e)	94,038	Wastewater volume (m ³)	543,263	Production-related waste (t)	12,161
		Volume recycled (m ³)	2,978	Volume recycled (t)	11,012
		Recycling rate (%)	0.5	Rate of landfill waste (%)	1.4

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

For the locations of applicable sites and their main lines of business, see page 8.

Calculation method

Resource and energy inputs in FY2021		
Resource consumption	The resource consumption is calculated by multiplying the shipments to main products shipped in FY2021 per weight.	
Total energy consumption	Total amount of electricity, steam, LPG/LNG, city gas, petroleum, etc. consumed at applicable business sites in FY2021	
	Crude petroleum equivalent	Calculated by converting electricity, gasoline, light oil, LPG, city gas, etc., into crude petroleum, respectively *: 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 applicable business sites in FY2021	
	Clean water, industrial water, and underground water	Measurement using a water meter

Material production/emissions in FY2021		
Greenhouse gas emissions	Market-based method: GHG emissions are calculated based on the emission factors of the electricity that is actually purchased.	
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 applicable business sites in FY2021

Environmental impact data of main business sites before FY2020 can be viewed by downloading the PDF file from the sustainability web site.

Environmental impact data of main business sites in FY2021

Resource consumption, Energy consumption

Name of site	Resource consumption (t)	Energy consumption					
		Electricity (MWh)	LPG (t)	City gas (1,000m ³)	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, and Logistics Center)	20,202	37,830	0	868	39	2	0
Nissei Corporation	7,710	28,333	13	1,973	23	2	4
Mie Brother Precision Industries, Ltd.	501	513	0	0	0.3	0	0
Brother Industries (U.K.) Ltd.	570	1,369	0	62	1	0.1	0
Brother Industries (Slovakia) s.r.o.	96	415	0	30	1	6	0
Taiwan Brother Industries, Ltd.	1,800	1,475	6	0	0	0	0
Zhuhai Brother Industries, Co., Ltd.	5,338	2,296	0	0	2	9	0
Brother Machinery Xian Co., Ltd.	11,714	8,125	0	290	0	0.2	0
Brother Technology (Shenzhen) Ltd.	24,578	15,030	0	200	26	11	0
Brother Industries (Philippines), Inc.	35,552	26,699	55	0	0.3	192.5	0
Brother Industries (Vietnam) Ltd.	85,837	33,818	86	0	0	28	0
Brother Machinery Vietnam Co., Ltd.	0	0	0	0	0	0	0
Brother Industries Saigon, Ltd	14,268	4,011	0	0	0.1	0.2	0

Greenhouse gas emissions

Name of site	Greenhouse gas emissions (t-CO ₂ e)		
	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, and Logistics Center)	1,735	18,919	16,305
Nissei Corporation	3,837	14,170	12,212
Mie Brother Precision Industries, Ltd.	1	257	221
Brother Industries (U.K.) Ltd.	120	311	0
Brother Industries (Slovakia) s.r.o.	76	66	0
Taiwan Brother Industries, Ltd.	18	821	751
Zhuhai Brother Industries, Co., Ltd.	31	1,407	1,407
Zhuhai Brother Industries, Co., Ltd.	549	4,979	4,979
Brother Technology (Shenzhen) Ltd.	479	9,210	9,210
Brother Industries (Philippines), Inc.	684	18,668	23,955
Brother Industries (Vietnam) Ltd.	335	15,316	15,316
Brother Machinery Vietnam Co., Ltd.	0	0	0
Brother Industries Saigon, Ltd	1	1,817	1,817

Location-based method: GHG emissions are calculated based on the grid average emission factors in a certain area, such as a country or region.

Following are the references for location-based emission factors.

- IEA- Emission Factors 2020
- GHG Protocol-Calculation tools
- DEFRA

Water intake, wastewater volume, volume of water recycled

Name of site	Water intake (m ³)			Wastewater volume (m ³)			Volume of water recycled (m ³)	Percent of water recycled (%)
	Clean water	Industrial water	Under-ground 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, and Logistics Center)	54,852	0	7,101	0	60,334	146	0	0.0
Eight business sites in Japan (Manufacturing Facility, Kariya)	14,830	0	4	14,830	0	4	0	0.0
Nissei Corporation	62,258	0	0	0	22,252	0	0	0.0
Mie Brother Precision Industries, Ltd.	60	0	1,019	1,079	0	0	0	0.0
Brother Industries (U.K.) Ltd.	1,465	0	0	0	1,465	0	0	0.0
Brother Industries (Slovakia) s.r.o.	0	0	3,219	0	3,219	0	0	0.0
Taiwan Brother Industries, Ltd.	8,084	0	0	0	7,903	0	0	0.0
Zhuhai Brother Industries, Co., Ltd.	45,280	0	0	0	40,752	0	0	0.0
Brother Machinery Xian Co., Ltd.	27,780	0	0	0	21,735	0	1,200	5.2
Brother Technology (Shenzhen) Ltd. Baolong Manufacturing Facility	100,500	0	0	0	100,500	0	200	0.2
Brother Technology (Shenzhen) Ltd. Nanwan Manufacturing Facility	11,683	0	0	11,683	0	0	0	0.0
Brother Industries (Philippines), Inc.	0	0	100,354	0	85,301	0	1,162	1.3
Brother Industries (Vietnam) Ltd.	142,800	0	0	142,800	0	0	293	0.2
Brother Machinery Vietnam Co., Ltd.	0	0	0	0	0	0	0	0.0
Brother Industries Saigon, Ltd	36,574	0	0	0	29,259	0	123	0.4

Water pollution load

Name of site	Water pollution load (mg/L)			
	BOD	COD	N- hexane extracts	SS
Eight business sites in Japan (Hoshizaki Manufacturing Facility)	60.8	-	3.2	-
Eight business sites in Japan (Kariya Manufacturing Facility)	3.0	6.8	<1	3.8
Eight business sites in Japan (Logistics Center)	14.0	-	<1	-
Nissei Corporation	140.8	-	0.1	3.0
Mie Brother Precision Industries, Ltd.	3.0	10.0	ND	8.0
Brother Industries (U.K.) Ltd.	-	-	-	-
Brother Industries (Slovakia) s.r.o.	5.0	17.3	-	<5
Taiwan Brother Industries, Ltd.	2.3	21.8	-	14.5
Zhuhai Brother Industries, Co., Ltd.	8.1	31.5	-	13.5
Brother Machinery Xian Co., Ltd.	14.3	50.7	0.1	20.7
Brother Technology (Shenzhen) Ltd. Baolong Manufacturing Facility	37.0	131.5	-	15.5
Brother Technology (Shenzhen) Ltd. Nanwan Manufacturing Facility	5.7	22.5	0.8	6.0
Brother Industries (Philippines), Inc.	197.0	405.7	4.9	89.8
Brother Industries (Vietnam) Ltd.	13.0	28.0	-	<0.04
Brother Machinery Vietnam Co., Ltd.	-	-	-	-
Brother Industries Saigon, Ltd	52.6	92.2	-	-

Waste amount

Target: Reduction in waste amount compared to the previous FY

Actual: Reduction of 12,963 tons compared to 1,494 tons in the previous FY

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, and Logistics Center)	2,273	2,052	216	6	0	0	0.0
Nissei Corporation	3,195	2,324	870	0	0	1	0.0
Mie Brother Precision Industries, Ltd.	118	59	59	0	0	0	0.0
Brother Industries (U.K.) Ltd.	262	214	48	0	0	0	0.0
Brother Industries (Slovakia) s.r.o.	610	505	104	0	0	0	0.0
Taiwan Brother Industries, Ltd.	538	29	0	50	459	0	0.0
Zhuhai Brother Industries, Co., Ltd.	183	159	0	23	1	0.0	0.0
Brother Machinery Xian Co., Ltd.	347	235	0	55	56	0	0.0
Brother Technology (Shenzhen) Ltd.	281	215	65	0	1	0	0.0
Brother Industries (Philippines), Inc.	1,067	893	0	0	0	174	16.3
Brother Industries (Vietnam) Ltd.	2,819	2,536	0	275	8	0	0.0
Brother Machinery Vietnam Co., Ltd.	0	0	0	0	0	0	0.0
Brother Industries Saigon, Ltd	468	429	0	39	0	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 manufacturing facilities is sent to landfill).

Location and main line of business of applicable sites

Name of site	Location	Main line of business (as of March 31, 2022)
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, and 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 and 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 online karaoke equipment, mobile printers, electronic stationery, etc.; recycling of toner cartridges; 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.	Zhuhai, Guangdong, China	Production of electronic stationery, scanners, industrial printing equipment, etc.
Brother Machinery Xian Co., Ltd.	Xian, Shaanxi, China	Production of industrial sewing machines and machine tools
Brother Technology (Shenzhen) Ltd.: Baolong Manufacturing Facility, Nanwan Manufacturing Facility	Shenzhen, 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	Operations discontinued in December 2020
Brother Industries Saigon, Ltd.	Dong Nai Province, Vietnam	Production of home sewing machines