

Environmental Initiatives in 2017

HORIBA

Overview of the Environmental Impacts



We provide a range of analytical measurement instruments and peripheral equipment required for environmental measurement. In order to fulfill social responsibilities, we also develop eco-design products with its life cycles in mind, which comply with environmental laws and regulations. At the same time, together with our suppliers, we make consistent efforts to conserve resources and energy during production. Our employees also have a strong interest in environmental issues. We participate in environmental volunteer work like cleaning and collecting trash in areas alongside river and around company offices, conducting environmental delivering classes in elementary and junior high schools, and working at environmental events organized by government organizations.

Environmental Initiatives

In 2017, the HORIBA group companies in Japan adopted the following goals for environmental conservation under the Integrated (Quality, Environment and Occupational Health and Safety) Management System. We promote efforts to build safe and efficient clean factories and contribute to the protection of the global environment.

Goals:

- ① Develop energy and resource conservation activities in order to reduce CO₂ emissions per unit of sales
- ② Maintain and expand zero-emission

Overview of the Environmental Impacts: Balance in Materials

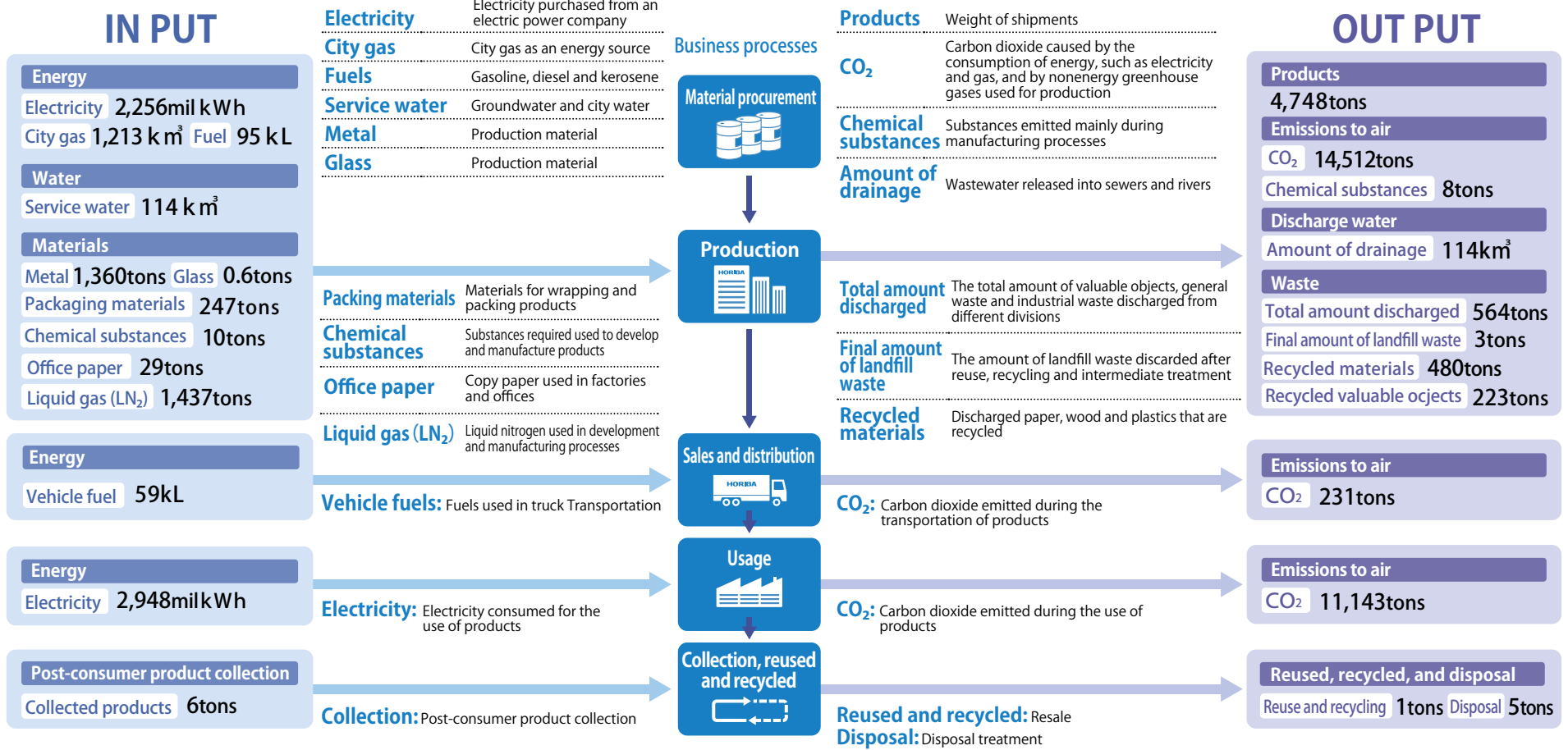
We work hard to obtain an overview of the environmental impact caused by the domestic HORIBA Group as a whole during each stage of our business activities. As for the environmental impact for 2017, CO₂ emissions showed an upward trend due to an increase in production from sales growth. However, CO₂ emissions per unit sales showed a downward trend. HORIBA Group will continue to proactively work on reducing environmental impact going forward.

Overview of the Environmental Impacts: Balancing Environmental Impacts

Material Flow Chart for 2017 to Determine Environmental Impacts

Scope: Domestic production sites

HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC, Co., Ltd. head office/factory and Aso Factory, and HORIBA Advanced Techno Co., Ltd. head office/factory



Overview of the Environmental Impacts: Environmental Impacts in Production Sites

Global

Group Companies(Production Sites)

Company Name	Abbreviation	Location
HORIBA Instruments Incorporated Irvine Facility	HII(Irvine)	U.S.A. (California)
HORIBA Instruments Incorporated Austin Office HORIBA Instruments Incorporated Santa Clara Office Former HORIBA STEC	HII (Austin/ Santa Clara) Former SHI	U.S.A. (Texas) U.S.A. (California)
HORIBA Europe GmbH	HE	Germany (Oberursel, Darmstadt)

Company Name	Abbreviation	Location
HORIBA UK Limited	HUK	U.K.
HORIBA ABX SAS	HMFR	France (Montpellier)
HORIBA Jobin Yvon SAS	JYFR	France (Longjumeau)
HORIBA (Austria) GmbH	HA	Austria (Tulln)
HORIBA, Ltd	HOR	Japan (Kyoto)
HORIBA STEC, Co., Ltd.	STEC	Japan (Kyoto)
HORIBA Advanced Techno Co., Ltd.	HAT	Japan (Kyoto)
HORIBA KOREA LTD.	HKL	South Korea (Kyunggido)
HORIBA INSTRUMENTS (SHANGHAI) CO., LTD.	HSC	China (Shanghai)

Environmental Impact of Group Production Sites in 2017

	Item/Region	U.S.A		Europe					Asia					
		Group Company Name (Abbreviation)	HII (Irvine)	HII (Austin/Santa Clara)	HE	HUK (Northampton)	HMFR	JYFR	HA	HOR	STEC	HAT	HKL	HSC
INPUT	Electricity consumption MW·h		790	972	1,648	395	2,986	5,239	40	11,862	10,579	118	77	900
	City gas consumption km ³		-	7	69	11	-	254	7	1,158	54	0.01	0	-
	Water consumption km ³		6	-	2.2	1.1	20	11	0.1	49	64	1	-	1
	Consumption of fuel oil & fuel for vehicles kL		-	18	249	-	-	67	18	53	24	18	3	11
	Quantity of chemicals consumed t		-	-	2	-	37	-	-	10.4	-	-	-	-
	Office paper t		3	2	6	1.6	10	3	-	22	4	3	0.2	0.2
	Packing materials t		-	-	5	-	544	-	-	226	21	-	1	-
OUTPUT	CO ₂ emissions t-CO ₂		466	629	1,555	202	149	950	63	8,818	5,592	101	33	328
	Wastewater discharge km ³		6	-	2.2	1.1	-	11	0.1	49	64	1	-	1
	Waste emissions t		29	-	49	27	830	51	7	417	138	8	3.9	2
	Number of employees Person		152	50	523	189	526	314	27	1,903	576	289	28	138

Overview of the Environmental Impacts: Environmental Impacts in Non-production Sites



Environmental Impacts in Non-production Sites

(HORIBA, Ltd. sales offices and training and recreation facilities/HORIBA Techno Service Co., Ltd. service stations)

	Number of locations and category		HORIBA, Ltd. sales offices (14 locations)			HORIBA Techno Service Co., Ltd. service stations (26 locations)			HORIBA, Ltd. training and recreation facilities (2 locations)		
			2015	2016	2017	2015	2016	2017	2015	2016	2017
INPUT	Electricity consumption	MWh	543	576	606	360	376	385	237	255	281
	City gas consumption	km ³	1.4	1.1	1.3	2.9	2.7	3.0	0.3	0.3	0.3
	LP gas consumption	km ³	0	0	0	0	0	0	11	12	16
	Fuel consumption	kL	101.6	120.5	101.5	175.4	177.7	173.7	-	-	-
	Office paper	t	7.1	6.3	6.3	3.1	3.4	3.7	-	-	-
	Packing materials	t	1.4	1.4	1.4	4.6	4.4	4.7	-	-	-
OUTPUT	CO ₂ emissions	t-CO ₂	557	577	549	624	610	607	186	202	236
	Amount of waste generated	t	33.8	34.3	37.5	34.9	26.0	36.9	-	-	-

Sales Offices (14 locations) : Sapporo, Sendai, Fukushima, Utsunomiya, Tsukuba, Tokyo, Yokohama, Nagoya, Toyota, Hamamatsu, Osaka, Takamatsu, Hiroshima, Fukuoka

Service stations (26 locations) : Sapporo, Sendai, Fukushima, Utsunomiya, Ichihara, Kashima, Tsukuba, Kawaguchi, Tokyo, Kokubunji, Yokohama, Fuji, Hamamatsu, Toyota, Nagoya, Toyama, Yokkaichi, Osaka, Himeji, Kurashiki, Hiroshima, Yamaguchi, Takamatsu, Fukuoka, Oita, Kumamoto

Training and recreation facilities (2 locations) : Takashima (Shiga Prefecture) and Kyoto

Energy Conservation and Initiatives to Reduce CO₂ Emission

Total CO₂ emissions generated by HORIBA Group companies in Japan in 2017 increased by 4.4% to 14,512 tons compared to the previous year. Total CO₂ emissions per unit sales, however, decreased by 13.4% from 2016.

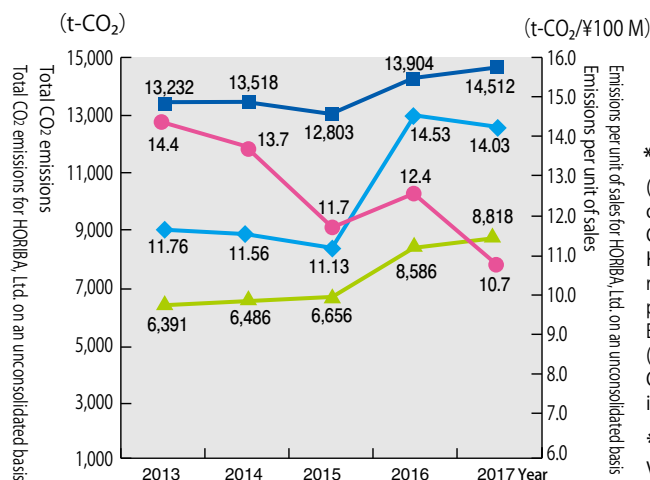
Also, CO₂ emissions for HORIBA, Ltd. alone increased by 2.7% to 8,818 tons compared to 2016. Emissions per unit sales resulted in a decrease of 3.5% from 2016.

The increase in CO₂ emissions is attributed to increased operation at

production-related facilities in line with increased sales. We will continue to make use of our energy monitoring system for waste-free energy use going forward.

Total CO₂ Emissions

- Total CO₂ emissions (t-CO₂/year)
- ▲ Total CO₂ emissions for HORIBA, Ltd. on an unconsolidated basis (t-CO₂/year)
- Emissions per unit of sales (t-CO₂/¥100 M)
- ◆ Emissions per unit of sales for HORIBA, Ltd. on an unconsolidated basis (t-CO₂/¥100 M)

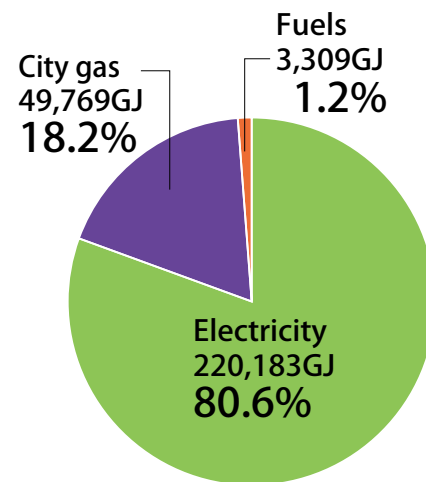


***1 CO₂ emission factor:**
 (1) Electricity: The official values of the Kansai Electric Power Company were adopted for the Kyoto-Shiga region. For other regions, substitute values officially published by the Ministry of the Environment were adopted.
 (2) City gas: The official values of Osaka Gas Co., Ltd. were used in calculations.

***2 City gas consumption:**
 Values are converted to those in standard conditions (0°C, 1 atmospheric pressure).

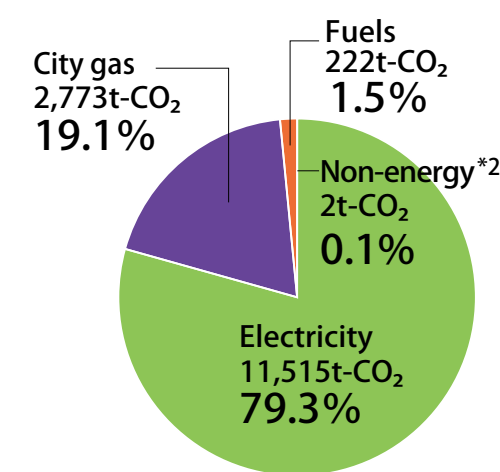
Types of Energy Consumption in 2017

(Scope: Domestic production sites*1)



Energy Types of Greenhouse Gas Emissions (CO₂ Equivalent) in 2017

(Scope: Domestic production sites*1)



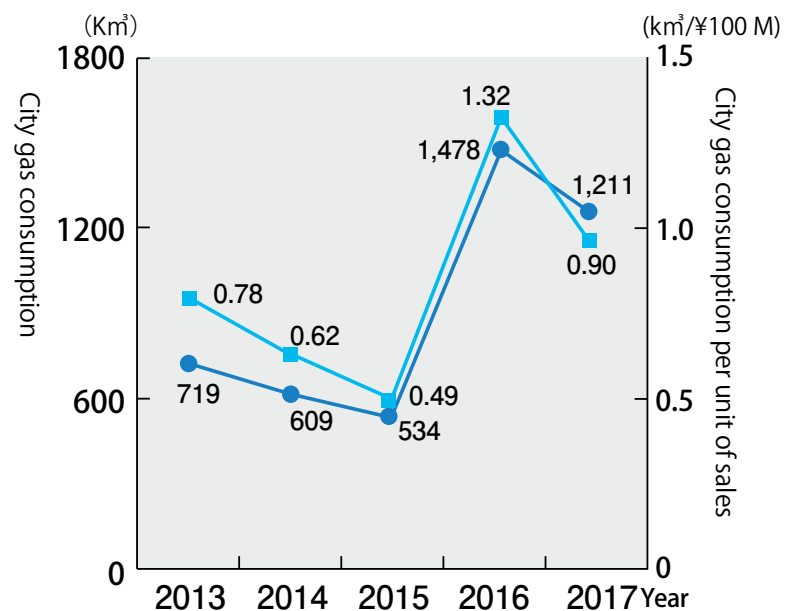
*1 Domestic production sites include the HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC Co., Ltd. head office/factory and Aso Factory, and HORIBA Advanced Techno Co., Ltd. head office/factory.
 *2 Non-energy: Sulfur hexafluoride, perfluoromethane, etc.

Energy Consumption

City Gas Consumption

(Scope: Domestic production sites*)

- City gas consumption (km³)
- City gas consumption per unit of sales (km³/¥100 M)



【Factor in the increase of city gas consumption】

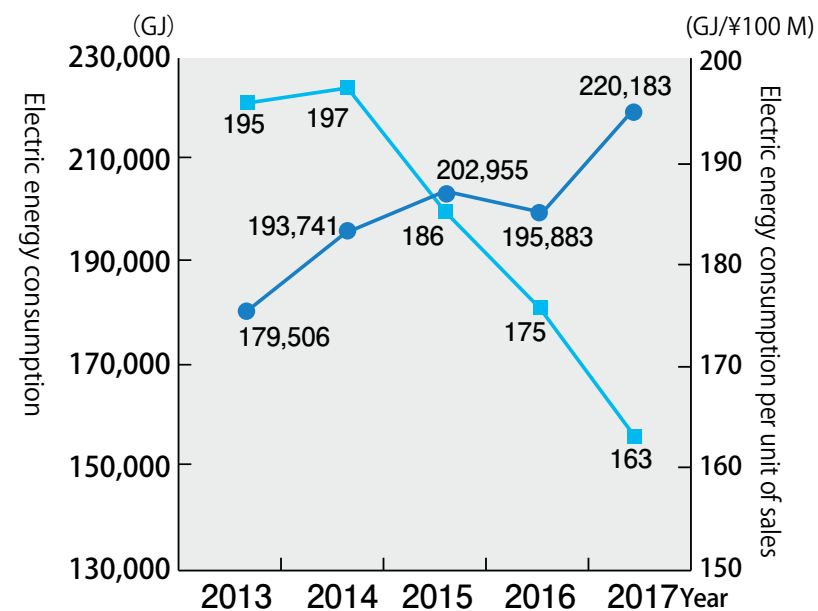
The increase in 2016 is attributed to full-operation of gas cogeneration systems installed at HORIBA BIWAKO E-HARBOR, which resulted in the increase in city gas consumption. Operation of this system was reviewed in 2017.

* Domestic production sites include the HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC Co., Ltd. head office/factory and Aso Factory, and HORIBA Advanced Techno Co., Ltd. head office/factory.

Electric Energy Consumption

(Scope: Domestic production sites*)

- Electric energy consumption (GJ)
- Electric energy consumption per unit of sales (GJ/¥100 M)



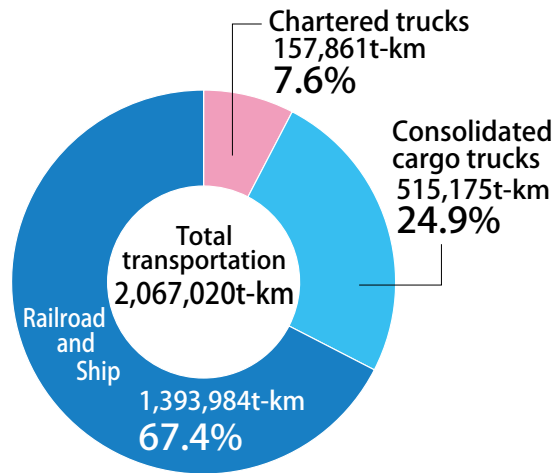
【Factor in the increase and decrease of electrical energy consumption】

For 2016, redevelopment in the Kyoto factory attributed to the reduced operations of facilities and equipment; however, business growth in 2017 led to significant increase.

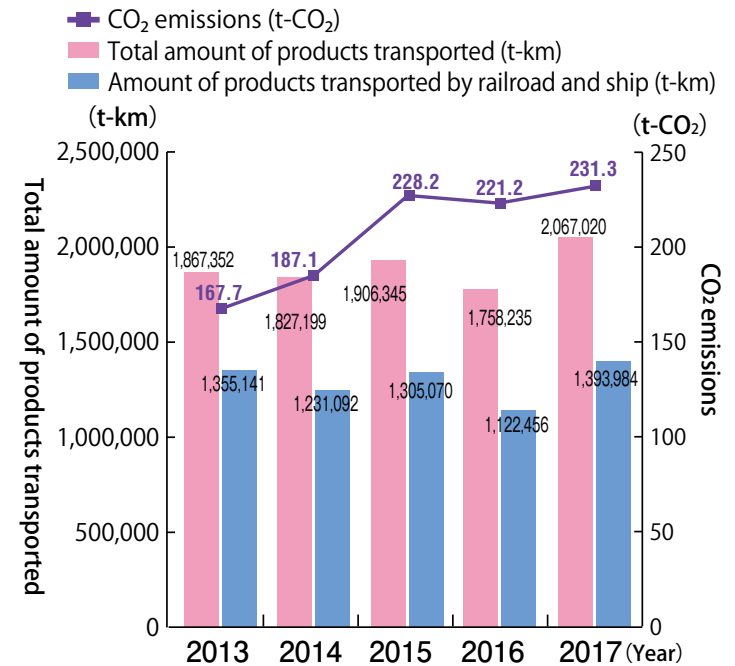
Initiatives for Reduction of CO₂ Emissions in Logistics

The HORIBA Group in Japan is committed to reducing CO₂ emissions from product transportation. Our recent initiatives include rail and marine transport. We started using rail transport between Kyoto and Tokyo in 2004, and rail transport between Kumamoto and Tokyo starting in 2006, which was switched to marine transport in September 2013 between Kumamoto and Tokyo. The use of rail and marine transport in over 60% of the total transport led to a reduction of CO₂ emissions by 300 to 400 tons every year. We remain committed to further boosting transport efficiency by, for example, joint transport with other companies.

Railroad Utilization Rate for the Transportation of Products in 2017
(Scope: Domestic production sites*)



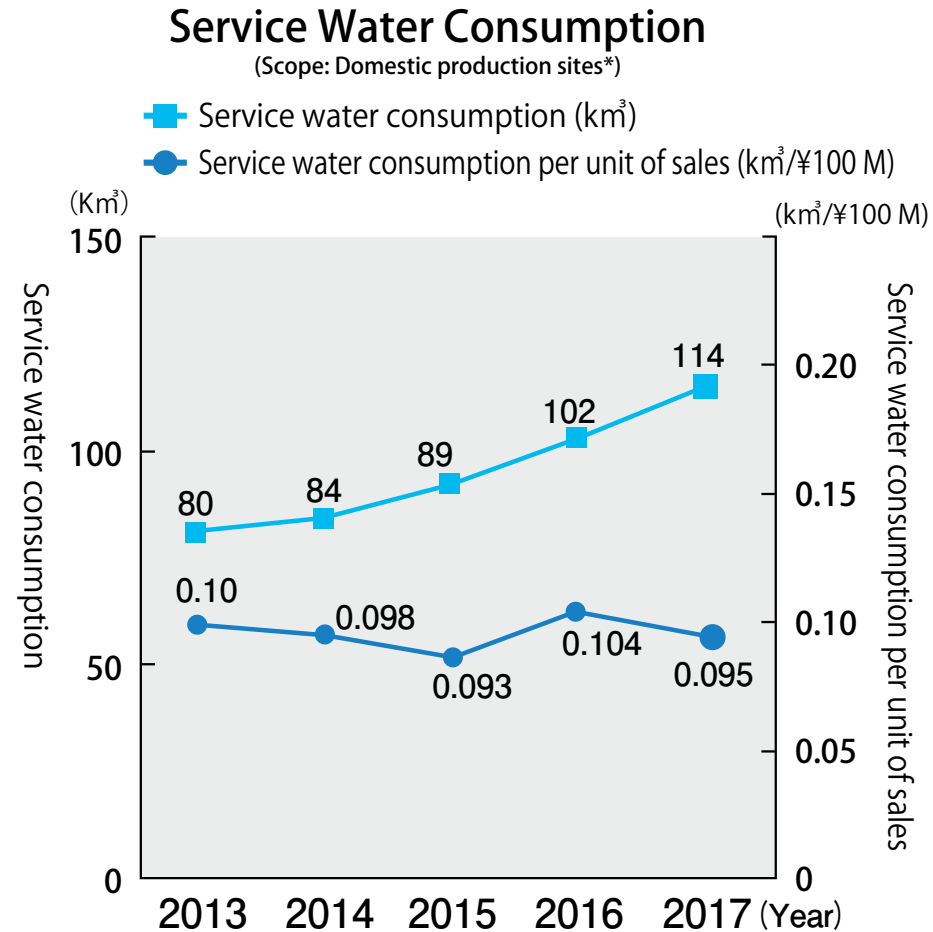
The Amount of Products Transported and the Amount of CO₂ Emissions
(Scope: Domestic production sites*)



* Domestic production sites include the HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC Co., Ltd. head office/factory and Aso Factory and HORIBA Advanced Techno Co., Ltd. head office/factory.

Use of Service Water and Monitoring of Wastewater

The amount of service water HORIBA Group in Japan used in 2017 increased by approximately 12% from 2016 in line with business growth; however, it was an 8% decrease viewed from the total water consumption per unit sales. In 2018, we will make efforts to use service water more efficiently by monitoring use to reduce consumption per unit sales. Meanwhile, HORIBA, Ltd. uses a round-the-clock factory wastewater monitoring system. In 2017, there was no discharge of wastewater exceeding the Kyoto City wastewater discharge standard.



* Domestic production sites include the HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC Co.,Ltd. head office/factory and Aso Factory, and HORIBA Advanced Techno Co., Ltd. head office/factory.

Wastewater Measurement Categories and Trends in Measured Values

Scope: HORIBA, Ltd. head office/factory

(Units: mg/L) except pH * Under detection limit so omitted

	Regulation Category	Kyoto City Regulations	HORIBA Standards	Measured Result (maximum)			Detection Limit Value
				2015	2016	2017	
Environmental categories	pH	5~9	-	6.0~8.4	6.2~8.3	6.2~7.6	/
	n-Hexane extract	30	21	4.7	1.8	6.2	0.5
	Phenol	1	0.3	*	0.03	0.06	0.01
	Copper	3	0.9	0.350	0.091	0.200	0.002
	Zinc	2	1.0	0.560	1.100	0.630	0.002
	Iron (soluble)	10	3.0	0.14	1.10	0.08	0.01
	Manganese (soluble)	10	3.0	0.01	0.13	0.03	0.01
	Nickel	2	0.6	0.01	0.06	0.08	0.01
Toxic substances	Boron and its compounds	10	3.0	0.6	15	0.2	0.1
	Fluorine and its compounds	8	4.5	0.9	10.0	0.2	0.1
	Cadmium and its compounds	0.03	0.03	*	0.014	0.005	0.001
	Cyanogen compounds	1	0.3	*	*	*	0.1
	Lead and its compounds	0.1	0.07	*	0.07	*	0.01
	Hexavalent chromium	0.5	0.15	0.02	*	*	0.02
	Arsenic and its compounds	0.1	0.03	0.087	0.021	0.009	0.005
	Mercury and its compounds	0.005	0.0015	*	*	*	0.0005
	Trichloroethylene	0.1	0.09	*	*	*	0.01
	Dichloromethane	0.2	0.14	*	*	*	0.02
	Carbon tetrachloride	0.02	0.014	*	*	*	0.002
1,1,1-trichloroethane	3	0.9	*	*	*	0.3	

Note: Regulation figures are from Kyoto City sewage and drainage standards.

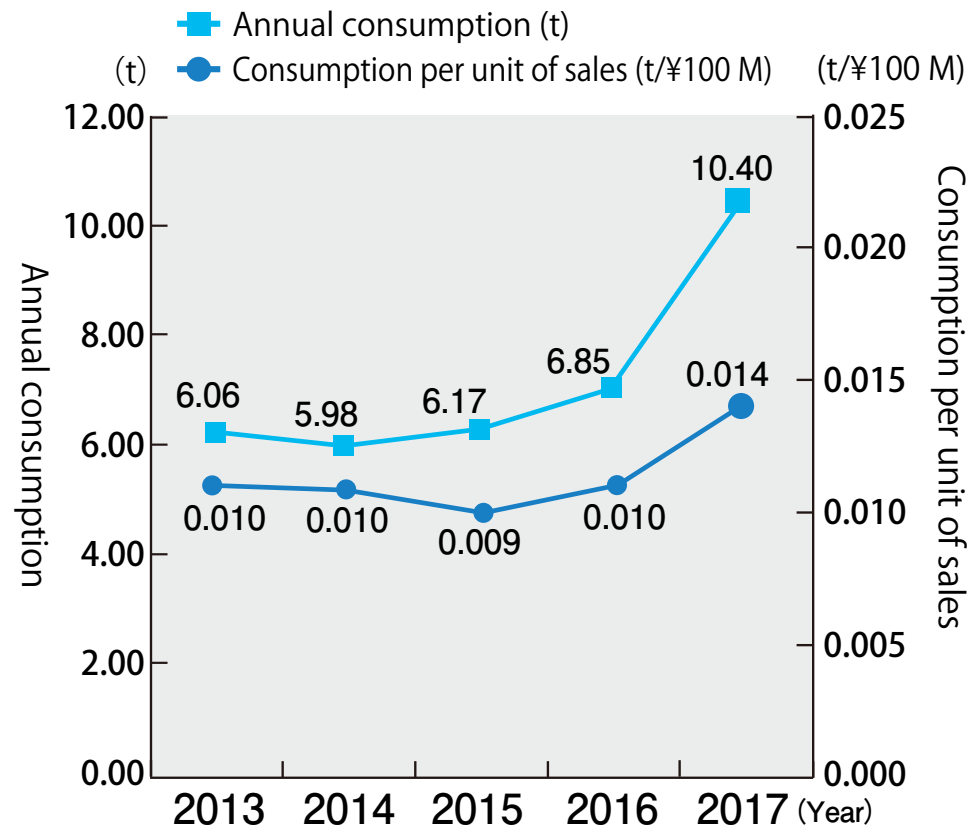
Use of Chemical Substance

In 2017, HORIBA, Ltd. used 10.4 tons of chemical substances (volume converted to total weight), marking a 3.56 ton increase from 2016. This increase is attributed to the increase in product development theme cases. The company has been keeping track of the use of PRTR controlled substances since 2010 to ensure compliance with the revised PRTR Law. Although this law requires entities to report the use of one or more tons of a specific chemical per year (0.5 or more tons for Class 1 substances), the company did not use any of the relevant chemicals to the level warranting a report in 2017. We will continue implementing improvement measures to reduce risks.

* PRTR (Pollutant Release and Transfer Register) Law: Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management

Trend in Quantity of Chemical Substances Consumed

(Scope: Domestic production sites*)



Major Chemical Substances Handled



Scope: HORIBA, Ltd. head office/factory

Unit: kg

CAS No.	Substance (IUPAC)	Annual Amount Handled			Amount Transferred			Amount Recycled			Main Application
		2015	2016	2017	2015	2016	2017	2015	2016	2017	
7664-39-3	Hydrofluoric acid	38	10	15	38	9	14	0	0	0	Semiconductors and others
64-17-5	Ethanol	331	254	500	102	66	157	0	0	0	Clean components
67-64-1	Acetone (dimethyl ketone)	147	128	262	115	95	222	0	0	0	Clean components
507-55-1	HCFC – 225; Product: H-997	73	48	28	0	26	6	0	0	0	Solvent/Product inspection
62-56-6	Thiourea	2	3	2	1	1	0	0	0	0	Regents production
7439-92-1	Lead solder	97	35	17	0	0	0	80	28	12	Printed circuit boards
7664-93-9	Piranha solution	162	87	108	162	87	108	0	0	0	Semiconductors
7722-84-1	Hydrogen peroxide	86	119	59	82	56	41	0	0	0	Liquid measurement and others
1330-20-7	Xylene	112	38	95	112	37	24	0	0	0	Semiconductors/ components

*CAS No.: Numerical identification numbers for chemical substances managed by the Chemical Abstracts Service, a division of the American Chemical Society

PRTR Substances Managed in 2017

Scope: HORIBA, Ltd. head office/factory

Minimum target treatment quantity: 10 kg Unit: kg

Ordinance No. #1	Substance	Annual Amount Handled	Added to Product	Amount Remove	Amount Emitted			Amount Transferred	Amount Recycled	Main Application
			Product Delivery	Compounds Neutralized/Decomposed/Synthesized	Air	Water	Soil	Industrial Waste	Transferred Outside	
300	Toluene	155.3	0.0	0.0	153.7	0.0	0.0	1.6	0.0	Product development
80	Xylene	94.8	0.0	0.0	70.6	0.0	0.0	24.2	0.0	semiconductors, Clean components
82	Silver and its water-soluble compounds	39.8	3.3	0.5	0.0	0.0	0.0	0.7	35.3	Soldering printed circuit board
333	Hydrazine	33.4	0.0	0.0	0.0	0.0	0.0	33.4	0.0	Semiconductors / Product development Product manufacturing / Product inspection
185	Dichloropentafluoropropane (HCFC-225); product name H-997	27.8	21.6	0.0	0.0	0.0	0.0	6.2	0.0	Product development/Product inspection
374	Hydrogen fluoride and its water-soluble salts	25.8	0.8	0.3	0.0	0.0	0.0	24.7	0.0	Semiconductors/Product development Product manufacturing/Product inspection
305	Lead compounds	16.5	4.1	0.0	0.0	0.0	0.0	0.0	12.4	Soldering printed circuit board
合 計		393.4	29.8	0.8	224.3	0.0	0.0	90.8	47.7	

* PRTR (Pollutant Release and Transfer Register) Law: Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management

*1 Ordinance No.: Numbers given in Table 1 of the Enforcement Ordinance for the Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management

Atmospheric Measurement Categories and Trends in Measured Values (at vents and site perimeters)

Scope : HORIBA, Ltd. head office/factory

* Under detection limit so omitted

Measurement Category		Unit	Kyoto Prefecture Regulations	Measured Result (maximum)		
				2015	2016	2017
At vents	Sulfuric acid	mg/m ³	3	-	-	<0.1
	Fluorine	mg/m ³ N	5	-	-	<0.5
	Hydrogen chloride	Vol ppm	20	-	-	<1
At site perimeters	Sulfuric acid	mg/m ³	0.03	-	-	0.010
	Fluorine	mg/m ³ N	0.05	<0.01	<0.01	<0.01
	Hydrogen chloride	Vol ppm	0.2	<0.02	0.04	<0.02

Note: Regulation figures are based on ordinances to protect Kyoto Prefecture environment.
Measurement at vents was not performed in 2015, 2016 due to the facility removal.
Due to redevelopment of the kyoto factory, Measurement Category was reviewed in 2017

* There have been no cases where the amount of hazardous substances to the air exceeded the amount decided by the law over the past three years.

Initiatives to Reduce Waste



HORIBA, Ltd. achieved zero emissions in the second term of 2006, and it has been achieving zero emission for the past five years. Since 2013, the scope expanded not only the company itself but all domestic production bases.

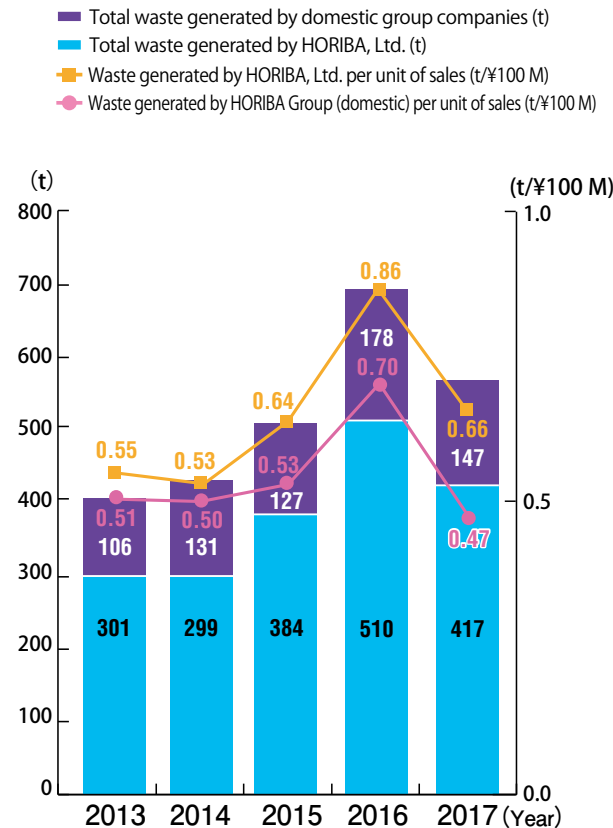
In 2017, redevelopment projects at various locations were completed, and the amount of waste products decreased by approximately 18%. We will drive further efforts to maintain zero emissions and suppress the amount of waste products.

*** HORIBA's definition of zero emissions:**
 "The total amount of landfill waste must not exceed 1 percent of total waste generated."

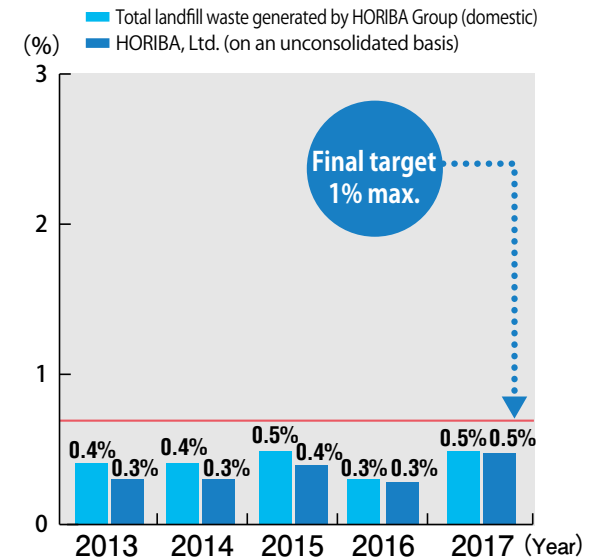
Total waste generated:
 A generic term for waste discharged from all divisions because it is no longer required (includes valuable resources, general waste and industrial waste).

Total amount of landfill waste:
 The total amount of waste delivered to landfill after the process of reuse, recycle, or intermediate treatment (including neutralization, change into nonhazardous substance, and incineration).

Total Waste Generation and Waste Generation per Unit of Sales



Trend in Total Amount of Landfilled Waste



Scope:
Domestic production sites:
 HORIBA, Ltd. head office/factory and Biwako Plant, HORIBA STEC, Co., Ltd. head office/factory and Aso Factory and HORIBA Advanced Techno Co., Ltd. head office/factory
Domestic group companies:
 HORIBA STEC, Co., Ltd. and HORIBA Advanced Techno Co., Ltd.
HORIBA Group (domestic):
 HORIBA, Ltd., HORIBA STEC, Co., Ltd. and HORIBA Advanced Techno Co., Ltd.

Environmental Accounting



In 2017, environmental protection costs for HORIBA, Ltd. were reduced by approximately 6% compared to 2016. The economic effect of the environmental protection initiative added up to approximately 1,773 million yen, which contributed to the company's profitability.

In addition, installation of a cogeneration system for power generation led to a substantial 70-million yen energy saving effect.

Environmental Accounting Standards:

- ① Investment/expenditure classification: Based on financial accounting standards
- ② Costs: Includes personnel, management and R&D expenses (excl. depreciation)
- ③ i) Personnel costs: Average labor costs × no. hrs environmental protection activities
ii) R&D economic benefit: Contribution of eco-friendly products to operating income
- ④ Based on Environmental Accounting Guidelines by the Ministry of the Environment (2005 version)

Costs of Environmental Protection (by Business Activity)

Scope: HORIBA, Ltd. head office/factory/Biwako Plant/14 sales offices and it's training center, HORIBA Techno Service Co., Ltd. 26 service stations
Accounting period: January 1, 2017 to December 31, 2017

(Millions of yen)

Environmental Protection Costs (by Business Activity)						Economic Effect (Internal)		
Category	Key Actions	Amount Invested	Total Cost	Total	Year-on-year Comparison (%)	Benefits of Amount	Remarks	
(1) Cost in Business area		16.1	75.1	91.2	69.4	150.5		
Details	1. Cost of pollution prevention	Maintained existing exhaust and drainage facilities; providing regular and preventive maintenance	0.0	2.7	2.7	5.0	12.7	Power-saving in facilities, effective operational benefits
	2. Cost of global environmental protection	Switchover of all air conditioners from electricity to gas, Promoting switchover to energy-efficient facilities, and other initiatives	16.1	11.8	27.9	127.5	70.8	Conversion to energy-efficient facilities, modification of equipment, effect of electricity conservation
	3. Cost of resource circulation	Water conservation and Promoting zero emissions activity	0.0	60.6	60.6	109.5	67.0	Reduction of water consumption, waste materials sold as valuable resources etc.
(2) Upstream and downstream cost	Promoting green purchasing, and collection and reuse of used products	14.2	13.6	27.8	105.4	5.9	Promotion of green purchasing and reuse of collected used products	
(3) Administration cost	Improved operational efficiency of environmental management systems, Promoting ecotraining and other initiatives	0.0	73.5	73.5	88.9	0.9	Benefit of environmental advertisements, etc.	
(4) R&D cost	Promoting eco-friendly design, complying to RoHS (Restriction of Hazardous Substances) Directive, and other initiatives	65.5	494.6	560.1	100.9	1,773.1	Expansion of eco-friendly products, contribution to operating income	
(5) Cost of social activities	Actively Promoting awareness-raising activities related to environmental technology and other initiatives	0.0	15.6	15.6	75.1	0.2	Support of environmental improvement, promotion of enlightenment initiatives	
(6) Cost of environmental remediation	N/A	0.0	0.0	0.0	0.0	0.0	N/A	
Total cost of environmental protection	—	95.8	672.4	768.2	94.1	1,930.6	—	

Environmental Accounting

Effect of Environmental Protection

Scope: HORIBA, Ltd. head office/factory/Biwako Plant/14 sales offices and it's training center, and HORIBA Techno Service Co., Ltd. 26 service stations
Accounting period: January 1, 2017 to December 31, 2017

Effect of Environmental Protection				
Category	Environmental Performance Indicator (unit)	2016 (standard)	2017	Difference from Standard (Environmental protection benefits)
Effect of resources invested related to environmental protection	Total energy input (GJ)	183,447	188,941	5,494 *1
	Power consumption (GJ)	110,990	128,202	17,212 *1
	City gas consumption (GJ)	59,930	49,342	△ 10,588 *1
	Fuels (diesel, kerosene and gasoline)	12,526	11,397	△ 1,129 *1
	Core production elements input (iron, SUS, aluminum, copper and glass) (t)	1,149	1,361	212
	Recycled resource input (t) Office paper and packing materials (cardboard, wood and polystyrene)	255	258	3
	Water input (km ³)	62	56	△ 6
	Groundwater input (km ³)	14	8	△ 6
	City water input (km ³)	43	48	5
	Effects to environment and waste generation by environmental protection	Greenhouse gas emissions (t-CO ₂)	9,975	10,210
Greenhouse gas emissions through electric energy consumption (t-CO ₂)		5,791	6,689	898 *2
Greenhouse gas emissions through city gas consumption (t-CO ₂)		3,343	2,754	△ 589 *2
Greenhouse gas emissions through fuel consumption (t-CO ₂)		840	765	△ 75 *2
Total waste generated (t)		571	492	△ 79
Final waste at landfill (t)		2	2	0 *3
Total water drained (km ³)		62	56	△ 6
Water quality (BOD/COD) (mg/L)		N/A	N/A	-
NOx and SOx emissions (t)		N/A	N/A	-
Malodor (max. density) (mg/L)		N/A	N/A	-

Environmental Protection Benefits				
Category	Environmental Performance Indicator (unit)	2016 (standard)	2017	Difference from Standard (Environmental protection benefits)
Effects in terms of goods and services generated	Energy consumption during operation (GJ) (Total of eco-friendly energysaving products)	78,705	148,957	70,252 *1
	Greenhouse gas emissions during operation (t-CO ₂) (Total of eco-friendly energy-saving products)	3,048	5,769	2,721 *2
	Hazardous substances emitted during disposal of used products and recycling of containers and packaging (t)	4	5	1
	Amount of used products, containers and packaging recycled (t)	1	1	0
Other effects of environmental protection	Amount of product packing materials used (t)	223	226	3
	Greenhouse gas emissions from transporting products (t-CO ₂)	204	189	△ 15 *2
	Products transported (t-km)	1,640,285	1,824,845	184,560
	Noise (dB) *Night time operation of HORIBA, Ltd head office/factory	48	50	2
Vibration (dB) *Night time operation of HORIBA, Ltd head office/factory	Less than 30	Less than 30	-	

* 1: GJ (gigajoule): Converted and calculated at 0.00976 GJ/kWh (from the April 1, 2006 public notification of the Energy Conservation Center).

* 2: CO₂ emissions factor: ① Electricity: Keiji region—Official values from KEPCO were applied; other regions—Alternate figures published by Japan's Ministry of the Environment were applied
② City gas: Official values from Osaka Gas were applied
③ Time of product usage: 0.378 kgCO₂/kWh (average of values for all Japan's electricity companies in 2000) was applied
④ Product transportation: a combination of the ton-kilometer method, transport area-specific cargo weight method, and other methods are used

* 3: Only for HORIBA, Ltd. head office/factory

Economic Benefits from Environmental Protection Activities

(Millions of yen)

Economic Benefits from Environmental Protection Activities (Substantial Benefits)		
	Effect	Amount
Profit	Sales of solder residue, etc. generated in production processes	4.7
	Gain on sale of recycled products	12.8
Total		17.5