

Environment

Management Approach

Basic Policy

In keeping with our ESG Charter, we at the Kaneka Group will contribute to realizing sustainable development and the enrichment of society by conserving resources and reducing environmental impacts at each stage of the entire product lifecycle.

Policy

Basic Policies for Responsible Care

1. Protect the natural ecosystem and reduce environmental impact

Focusing on the impact of corporate activities on the global environment and the ecosystem, we endeavor to reduce environmental impact and promote resource conservation and energy saving throughout the lifecycle of products.

2. Offer safe products and information

We endeavor to offer products that are safe to distribute and use, and to provide adequate information on the products such as instructions on how to use and handle products correctly.

3. Develop products and technologies in consideration of the environment and safety

Upon the development of new products, we give consideration to the environment and safety throughout the lifecycle of the products to the greatest extent possible, and endeavor to develop products and technologies with low environmental impact.

4. Reduce waste and promote the recycling of plastics

We reduce waste associated with manufacturing and its processes. We actively develop technologies for the adequate disposal or recycling of plastic waste concerning our products in cooperation with relevant industries, and endeavor to dispose of and recycle waste in a proper manner.

5. Enhance process safety, disaster-prevention, and occupational safety and health

Safety and disaster prevention constitute the foundations of the local community's trust, and occupational health and safety are issues that need to be fulfilled by chemical companies. We persistently strive to make improvements in these areas.

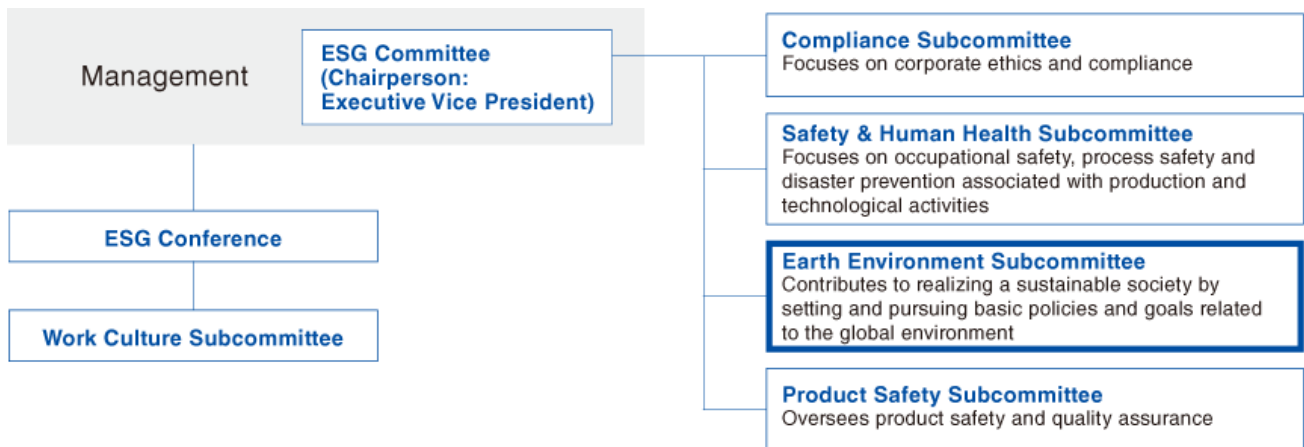
6. Win public confidence

From the management to every employee, all our members shall act in compliance with laws, regulations, standards, etc. relating to environment and safety both at home and abroad. Our approach to Responsible Care as such shall be publicized accurately to the public, in hope of rightfully gaining public recognition and confidence.

Promotion System

Important matters pertaining to the protection of the global environment are discussed by the Earth Environment Subcommittee and decided by the ESG Committee. Meanwhile, issues on global environment protection are shared and further discussed at the management meeting, the Plant Management Committee, and other meetings. The medium-term management plan also focuses on strengthening initiatives on important matters to further improve our ESG management.

■ Diagram of Promotion System



Environment

Environmental Management

Eco-Friendly Management

Under the policy of “providing solutions that contribute to the global environment and a rich life, while working to reduce environmental impacts and disclose timely information in fundamental business domains,” Kaneka Group engages in various environmental initiatives.

Eco-Friendly Products

Focusing on eco-friendly management from fiscal 2017, we will define, enhance, and expand our eco-friendly products(*1).

*1 Products that can contribute to reducing global environmental impacts at the stages of customer use, disposal and recycling, compared to conventional products

Energy Creation	Energy Storage	Energy Saving	Energy Saving	Waste Reduction	Chemical Pollution Prevention
					
<p>Product name VISOLA SoltileX GRANSOLA</p> <p>Intended use Solar power generation systems</p> <p>Reason for environmental contribution Creating energy with houses equipped with this product</p>	<p>Product name Residential electricity storage systems</p> <p>Intended use Residential stationary batteries</p> <p>Reason for environmental contribution Storing energy by houses equipped with this product</p>	<p>Product name Kanepearl</p> <p>Intended use Residential/automotive foams</p> <p>Reason for environmental contribution Saving energy as insulation and lightweight residential/automotive materials</p>	<p>Product name Eperan</p> <p>Intended use Automotive parts Package cushioning materials</p> <p>Reason for environmental contribution Saving energy as lightweight automotive parts</p>	<p>Product name PHBH</p> <p>Intended use Biodegradable Polymer (Packaging materials, garbage bags, foams)</p> <p>Reason for environmental contribution A naturally derived and biodegradable polymer that has little environmental impact when discarded</p>	<p>Product name KANEKA Surfactin</p> <p>Intended use Biosurfactant, Cleaning agents</p> <p>Reason for environmental contribution A naturally derived and biodegradable material friendly to the environment</p>

Definition of Eco-friendly Products

Kaneka Group has defined eco-friendly products as follows.

Type of Environmental Contribution	Qualitative Definition
GHG Reduction	Products reducing greenhouse gas (GHG) emissions
Energy Saving	Products lowering energy consumption
Energy Creation	Products creating energy
Energy Storage	Products storing energy
Waste Reduction	Products reducing waste
Resource Saving	Products achieving resource savings
Biomass	Products (derived from non-fossil materials) reducing reliance on fossil materials
Water Resources	Products saving water and improving the water environment
Chemical Pollution	Products preventing chemical pollution
Biodiversity	Products conserving biodiversity
Intermediate Materials	Intermediate materials essential to ensuring that finished products contribute to the environment
Disaster Control	Products helping disaster prevention and preparedness and reducing environmental impacts during a disaster
Adaptive Contribution	Products adapting to global warming

TOPICS

Development of T-Green Multi Solar, an exterior system that generates electricity utilizing the outer wall and window surfaces of buildings

We have developed, in partnership with Taisei Corporation, the exterior system “T-Green Multi Solar,” which generates electricity through photovoltaic laminates integrated into wall and window surfaces of buildings. With high efficiency in generating electricity, its multi-functionality (providing natural light, high visible light transmission, heat shielding and thermal insulation), and flexibility in building design, the system also functions as an independent emergency power source during times of disaster.

We will actively propose this system as an energy-creation technology towards realization of urban-type ZEBs (Zero Energy Buildings) to companies engaged in environmental management,

companies reinforcing their BCPs, public facilities acting as bases during disasters, and condominium residences aiming to strengthen their LCP (Life Continuity Performance).

* “T-Green” is a registered trademark of Taisei Corporation.



Sample of utilization (The exterior of a small- to medium-sized building)

Environmental Management Systems

Kaneka Group operates based on ISO 14001 and Eco-Action 21 environmental management systems, with the aim of reducing environmental impacts, preventing environmental problems, and responding quickly if any problems arise.

■ Kaneka and Group Company Certification under ISO 14001

Manufacturing Sites and Group Companies	Registration No.
Shiga Manufacturing Site	YKA4004950
Osaka Manufacturing Site	JCQA-E-0053
Kashima Manufacturing Site	JCQA-E-0054
Takasago Manufacturing Site	JCQA-E-0105
Tochigi Kaneka Co., Ltd.	0076859
Osaka Synthetic Chemical Laboratories, Inc.	JCQA-E-0343
Tatsuta Chemical Co., Ltd. Koga Plant	3571208
Showa Kaseikogyo Co., Ltd. Hanyu Headquarters Factory	E0062

Manufacturing Sites and Group Companies	Registration No.
Cemedine Co., Ltd. Ibaraki Office, Mie Plant	JCQA-E-0366
Cemedine Co., Ltd. Kinuura Plant	497791UM15
Vienex Corporation	JSAE1511
Kaneka Solartech Corporation	JQA-EM6704
Sanvic Inc.	JMAQA-E841
Kaneka Belgium N.V.	97 EMS 002e
Kaneka (Malaysia) Sdn. Bhd.	ER0523
Kaneka Paste Polymers Sdn. Bhd.	ER0523
Kaneka Eperan Sdn. Bhd.	ER0523
Kaneka Innovative Fibers Sdn. Bhd.	ER0523
Kaneka Apical Malaysia Sdn.Bhd.	ER0916

■ Eco-Action 21 Certification

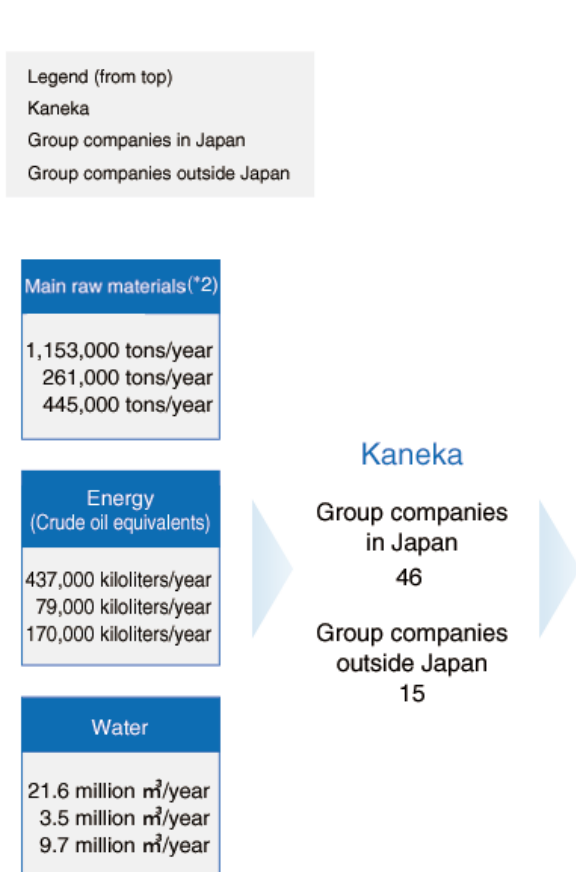
Group Company	Certification and Registration No.
Kyushu Kanelite Co., Ltd.	0001637
Kaneka Hokkaido Styrol Co., Ltd.	0001805
Kaneka Medix Corporation	0001893
Hokkaido Kanelite Co., Ltd.	0001905
Kaneka Tohoku Styrol Co., Ltd.	0010773
Nagashima Shokuhin Co., Ltd.	0003093
Kaneka Foam Plastics Co., Ltd. Moka Plant	0003247
Kaneka Chubu Styrol Co., Ltd.	0006600
Tokyo Kaneka Foods Manufacturing Corporation	0003473
Taiyo Yushi Corporation	0003575
Kaneka Foods Manufacturing Corporation	0003491
Kaneka Sun Spice Corporation	0003556
Kaneka Nishinippon Styrol Co., Ltd. Headquarters, Saga Plant, Kagoshima Plant, and Nagasaki Plant	0003949
Kanto Styrene Co., Ltd.	0004035
Kaneka Kanto Styrol Co., Ltd.	0004259
OLED Aomori Co., Ltd.	0010329
Kochi Styrol Co., Ltd.	0011039

Material Balance in Production Activities

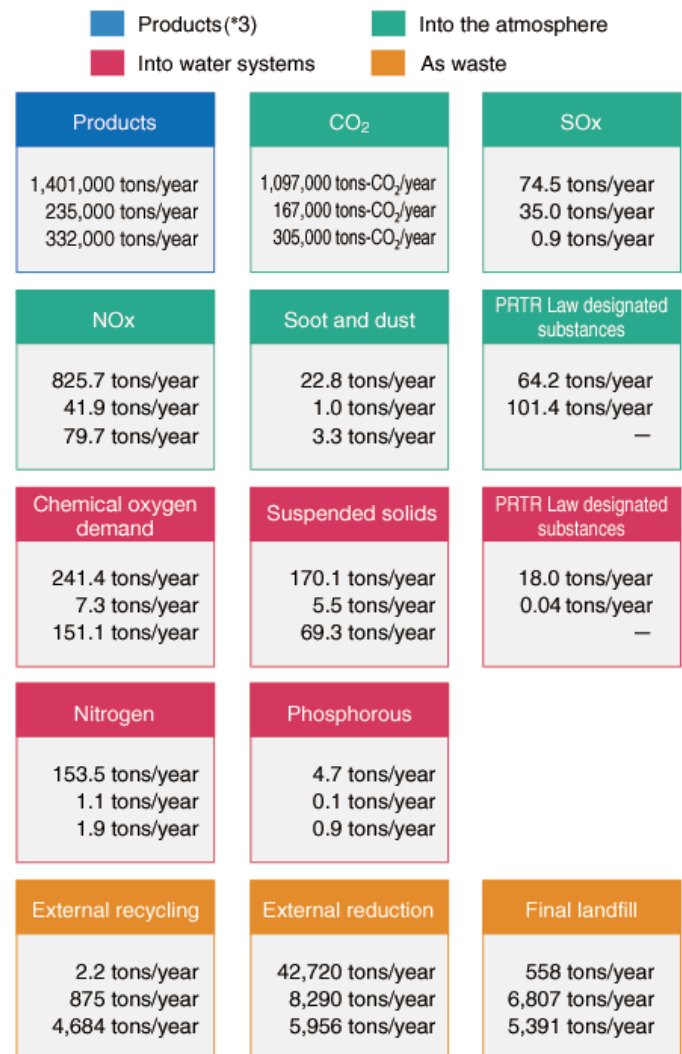
Kaneka Group is working to reduce environmental impacts by aggregating the status of energy and resource inputs and material outputs through emissions and products to grasp production activity volume, targeting Kaneka and Group companies within and outside Japan.

In fiscal 2018, while the inputs remained unchanged from the previous fiscal year, the outputs showed a decrease of NOx by 41.1 tons (4.1%) and of final landfill waste by 476.7 tons (7.8%).

INPUTS Energy and Resources



OUTPUTS Discharges, Recycling, and Products



*2 Raw materials calculated in or converted to tons.

*3 Products calculated in or converted to tons.

Environmental Accounting

We calculate the environmental costs (investments and expenditures) and benefits (material quantities), as well as economic impacts (in monetary units) of environmental measures on a consolidated basis for all parent Manufacturing Sites and 30 Group companies in Japan (manufacturing companies).

Results of Environmental Accounting

In fiscal 2018, environmental costs (investments) were about 900 million yen, a decrease of about 280 million yen from the previous fiscal year.

Environmental costs (expenditures) increased by about 240 million yen, 180 million yen, and 270 million yen for pollution prevention, resource recycling, and research and development, respectively, year-on-year.

Regarding the economic impacts of environmental measures, revenue from recycling and the cost reduction effect due to better resource efficiency (output per unit of input) declined by about 50 million yen and 40 million yen, respectively, year-on-year. Meanwhile, the reduction effect on waste disposal costs due to recycling and the cost reduction effect due to energy conservation and other savings increased by 120 million yen and 70 million yen, respectively, year-on-year.

These calculations are based on the 2005 edition of the Environmental Accounting Guidelines by Japan's Ministry of the Environment and other reference materials, with partial modifications.

■ Environmental Costs (Investments, Expenditures) (Millions of yen)

Cost Classifications	Main Efforts	Fiscal 2016		Fiscal 2017		Fiscal 2018	
		Investments	Expenditures	Investments	Expenditures	Investments	Expenditures
Business Area		1,046	4,884	1,177	5,036	901	5,460
1. Pollution Prevention	Air and water pollution prevention	1,011	3,150	1,130	3,236	899	3,476
2. Environmental Conservation	Addressing climate change and energy saving	-	-	-	-	-	-
3. Resource Recycling	Waste processing, recycling, and reduction	35	1,734	47	1,800	2	1,984
Upstream and Downstream	Product recycling, collection, and processing	0	8	0	8	0	6

Cost Classifications	Main Efforts	Fiscal 2016		Fiscal 2017		Fiscal 2018	
		Investments	Expenditures	Investments	Expenditures	Investments	Expenditures
Management Activities	Environmental education for employees and environmental impact monitoring and measurement	0	457	10	412	1	444
Research and Development	Research and development of products contributing to environmental conservation	0	6,728	0	7,203	0	7,477
Social Activities	Greening, beautification, and disclosure of environmental information	0	72	2	82	0	78
Environmental Damage	Payment of sulfur oxide emission charges	0	8	0	10	0	10
Total		1,046	12,157	1,188	12,752	902	13,475

* These calculations are based on the 2005 edition of the Environmental Accounting Guidelines by Japan's Ministry of the Environment and other reference materials, with partial modifications.
 Figures do not include research and development investment and global environment conservation costs.
 Amounts reported here may not fully match, due to rounding.

■ Quantitative Impact of Environmental Conservation Efforts

Category	Initiatives	Items	Units	Fiscal 2016	Fiscal 2017	Fiscal 2018
Pollution Prevention	Reduce atmospheric and water discharges of hazardous substances	SOx emissions	Tons	131.0	102.4	109.5
		NOx emissions	Tons	924.6	919.5	867.6
		Chemical oxygen demand	Tons	275.4	264.1	248.7
		PRTR Law-designated chemical emissions	Tons	160.3	168.5	183.6

Category	Initiatives	Items	Units	Fiscal 2016	Fiscal 2017	Fiscal 2018
Environment	Lower greenhouse gas emissions	CO ₂ emissions	Thousands of tons CO ₂	1,228.0	1,255.0	1,264.0
	Use less energy	Crude oil equivalents	Thousands of kiloliters	489.0	509.0	516.0
Resource Recycling	Reduce final landfill	Final landfill	Tons	252.0	806.9	877.2
	Increase external recycling	Amounts recycled	Tons	43,633.0	44,900.0	51,002.0

■ Economic Impacts of Environmental Measures

(Millions of yen)

Measures	Fiscal 2016	Fiscal 2017	Fiscal 2018
Revenue from Recycling	130	258	213
Cost Reductions by Better Resource Efficiency (Output per Unit of Input)	-297	4	-34
Waste Disposal Cost Reductions by Recycling	489	327	450
Cost Reductions by Energy Conservation	123	177	247
Total	445	766	876

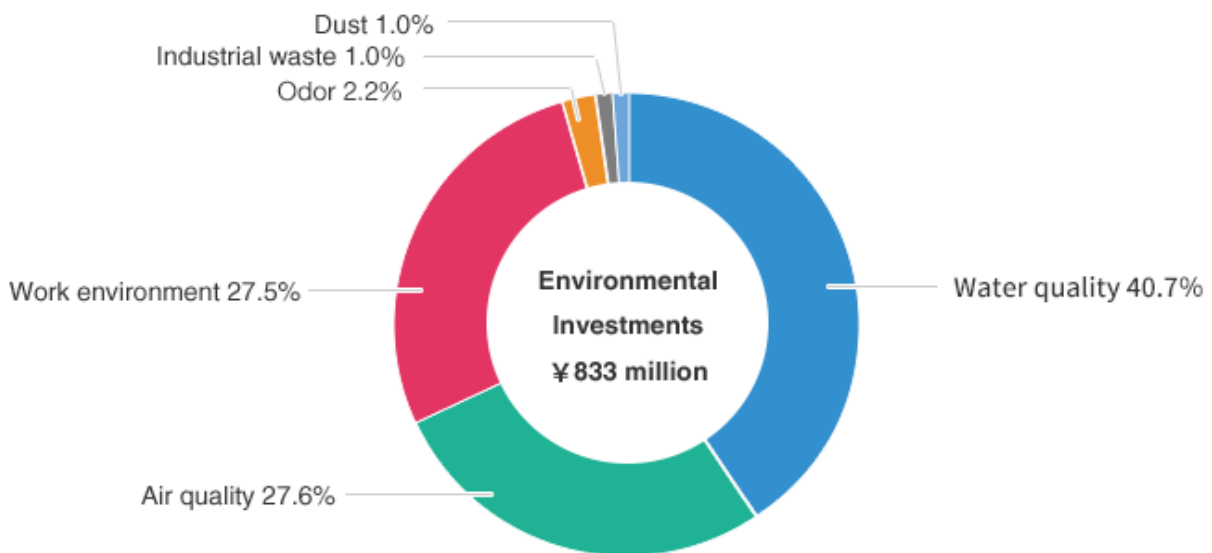
Environmental Investments (Kaneka)

We continue to invest in the environment.

Investments in fiscal 2018 totaled about 830 million yen, of which 40.7% was for water quality, 27.6% for air quality, 27.5% for the work environment, and 2.2% for odor treatment.

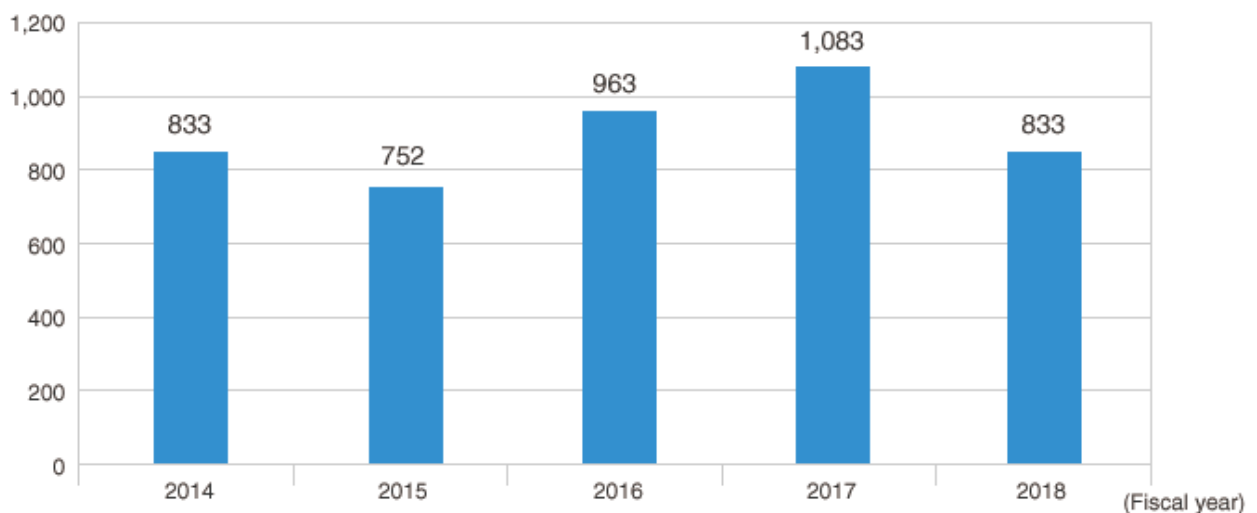
Environmental investment over the past five years averages about 890 million yen, leading with air quality (31.1%), followed by the work environment (27.8%) and water quality (22.3%). We will continue to invest proactively to maintain and improve the environment.

■ Environmental Investments in Fiscal 2018



■ Cumulative Environmental Investments

(Millions of yen)



Environmental Efficiency

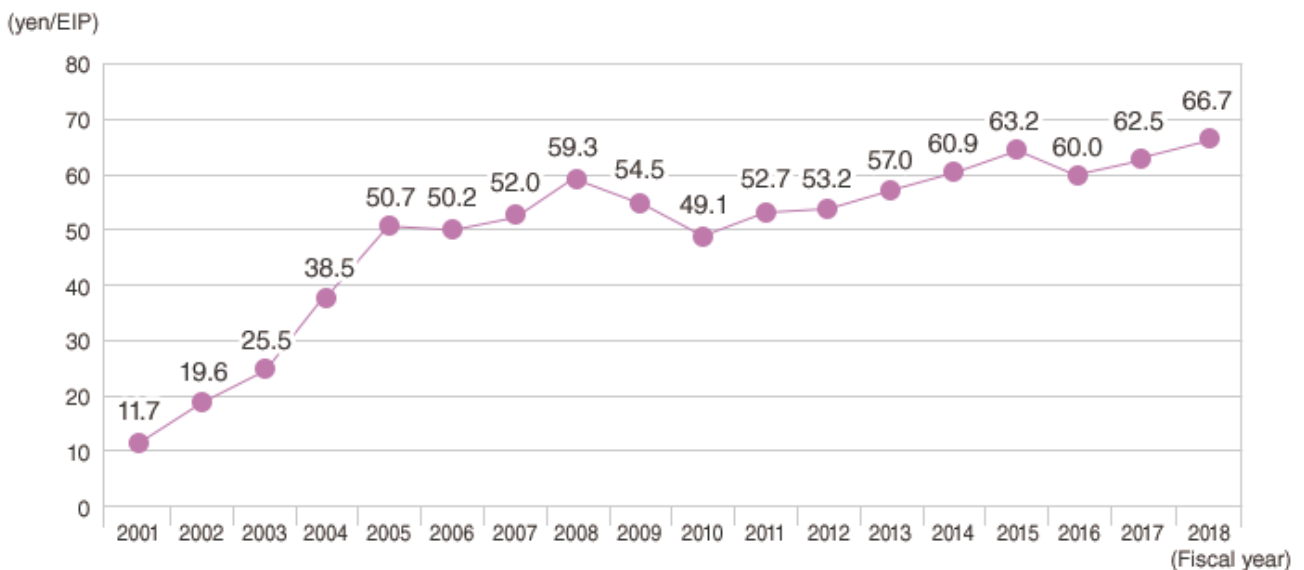
Kaneka assesses the environmental impacts of our production activities using Environmental Impact Points (EIP), which are compiled using the JEPIX methodology (*4), and we use those points to assess our environmental efficiency (*5).

Our total environmental impact in fiscal 2018 decreased slightly, by 2.6% from the previous fiscal year, to 4.57 billion EIPs, while our environmental efficiency improved by 6.7% from the previous fiscal year due to a reduction in environmental impacts.

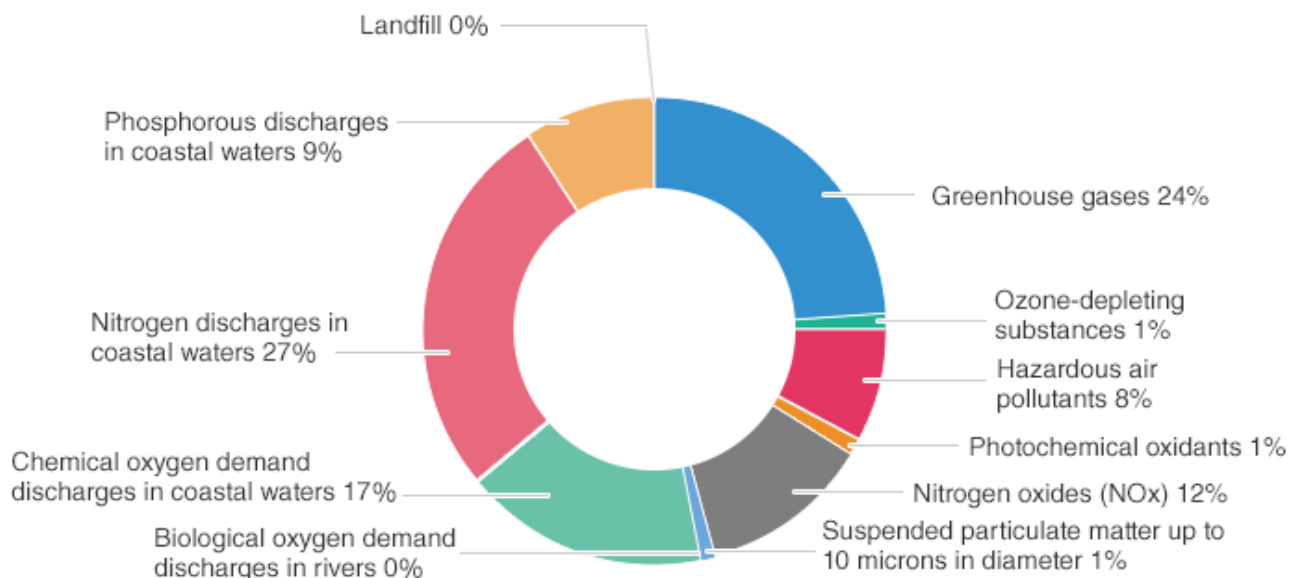
*4 The Japan Environmental Policy Priorities Index (JEPIX) methodology involves the calculation of an "eco-factor" coefficient for each emitted substance that has an environmental impact, using a ratio of the annual target for emissions under national environmental policies versus actual annual emissions ("Distance to Target"). The eco-factors are then multiplied by a quantity for each environmental impact to produce a single integrated index known as Environmental Impact Points (EIP). Calculations of eco-factors are done by the JEPIX Project (www.jepix.org, in Japanese).

*5 Environmental efficiency is a yardstick to measure efforts to maximize value while minimizing environmental impacts, with the aim of achieving sustainable growth. Kaneka calculates this by dividing net sales (yen) by the EIP.

■ Environmental Efficiency



■ Details of Total Environmental Impact



Fiscal Year	Net Sales (million yen)	Environmental Impact (100 million EIPs)	Environmental Efficiency (yen/EIP)
2016	274,866	45.8	60.0
2017	293,016	46.9	62.5
2018	304,951	45.7	66.7

Environmental Compliance

Kaneka Group continues working to reduce environmental risks through various means, including ISO 14001 internal audits and ESG safety and quality inspections, to check compliance with environmental regulations and legislation such as the Air Pollution Control Act and the Water Pollution Control Act, and with criteria in agreements with local governments.

CHECK & ACT

The environmental impacts of greenhouse gas increased slightly from the previous fiscal year, while the environmental impacts of NOx, COD discharge to coastal waters, and phosphorus decreased, resulting in a reduction of about 2.6% in the total environmental impact.

We will continue working to reduce environmental impact and improve environmental efficiency by promoting energy-saving activities.

Environment

Climate Change

We are undertaking efforts to address climate change, with the Earth Environment Subcommittee established under the ESG Committee. We are working to promote energy-efficient use to reduce CO₂ emissions through various measures, for example by utilizing our own environmental capital investment program.

We also use carbon-Life Cycle Analysis (cLCA) to calculate CO₂ emission reduction benefits by quantitatively assessing CO₂ emissions throughout product lifecycle, making comparisons with similar products. We also calculate indirect greenhouse gas (GHG) emissions (Scope 3) associated with our business activities through supply chains.

Energy Conservation Efforts

Our efforts at the Kaneka Group to address climate change include energy conservation, using the energy intensity index (*1) as an indicator for management.

The energy intensity index for of all parent Manufacturing Sites in fiscal 2018 was 91.6, a reduction of 0.3% from the previous fiscal year due to factors such as energy conservation activities and differences in the product mix. Although this did not reach our goal (a decrease of 1.0% year-on-year), annual reduction over the five years was 1.6% on average, which means we met our target.

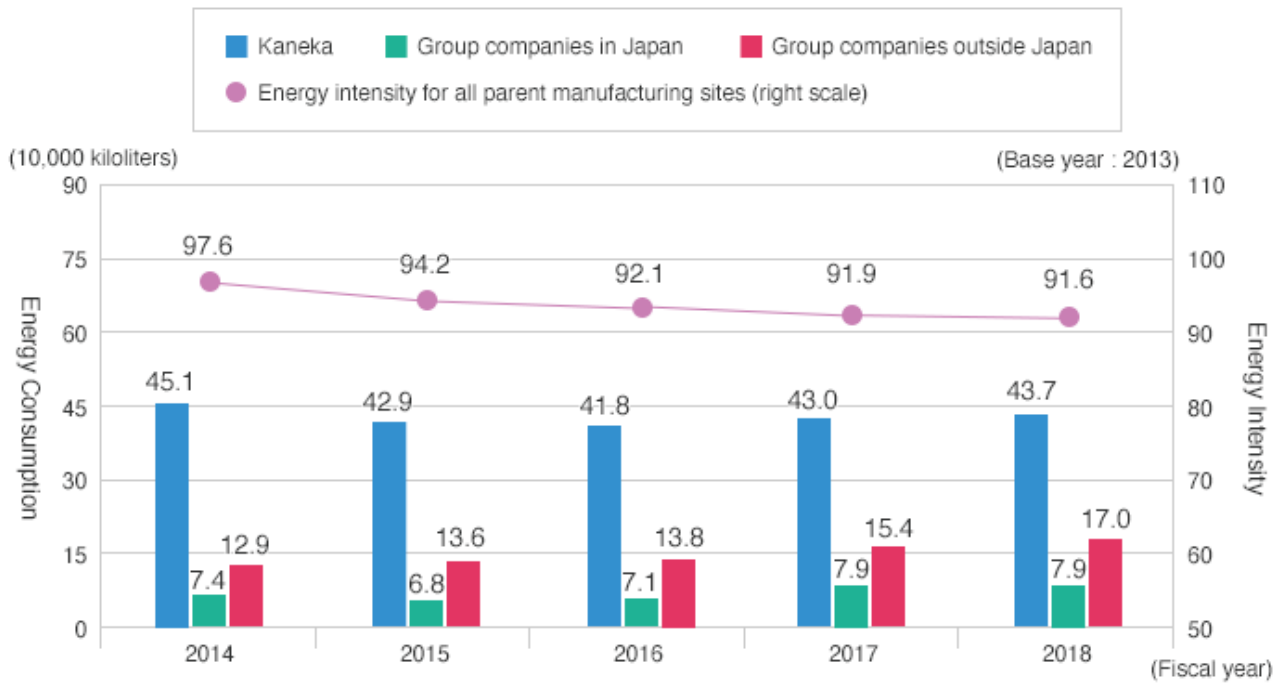
Consequently, since the start of the Business Operator Classification Assessment System under the Energy Saving Act, we have maintained the S-Class position (a business operator excellent in saving energy) for five consecutive years.

Non-consolidated energy consumption (*2) was 437,000 kiloliters, an increase of 1.7% from the previous fiscal year, mainly due to an increase in production output.

*1 Energy intensity index is a numeral value calculated by dividing the energy used in manufacturing (at all our parent manufacturing sites) by the active mass and indexing it against the baseline year of fiscal 2013 as 100. The amount of activity is an index representing the production volume of all our parent manufacturing sites. Energy consumption is calculated based on the Energy Saving Law (the Act on Rational Use of Energy).

*2 This energy consumption is the total for Kaneka (manufacturing sites and other facilities), with the boundaries being consistent with the Act on the Rational Use of Energy and the Action Plan for a Low Carbon Society prepared by the Japan Chemical Industry Association.

■ Energy Consumption (Crude Oil Equivalents) and Energy Intensity



Initiatives to Cut CO₂ Intensity

At Kaneka, we are working to reduce CO₂ intensity, using a CO₂ intensity index (*3) as an indicator for management, based on CO₂ emissions from energy consumption associated with production activities. The energy-origin CO₂ emission intensity index for all parent Manufacturing Sites in fiscal 2018 was 91.4, achieving our fiscal 2020 target of 93.2 in advance.

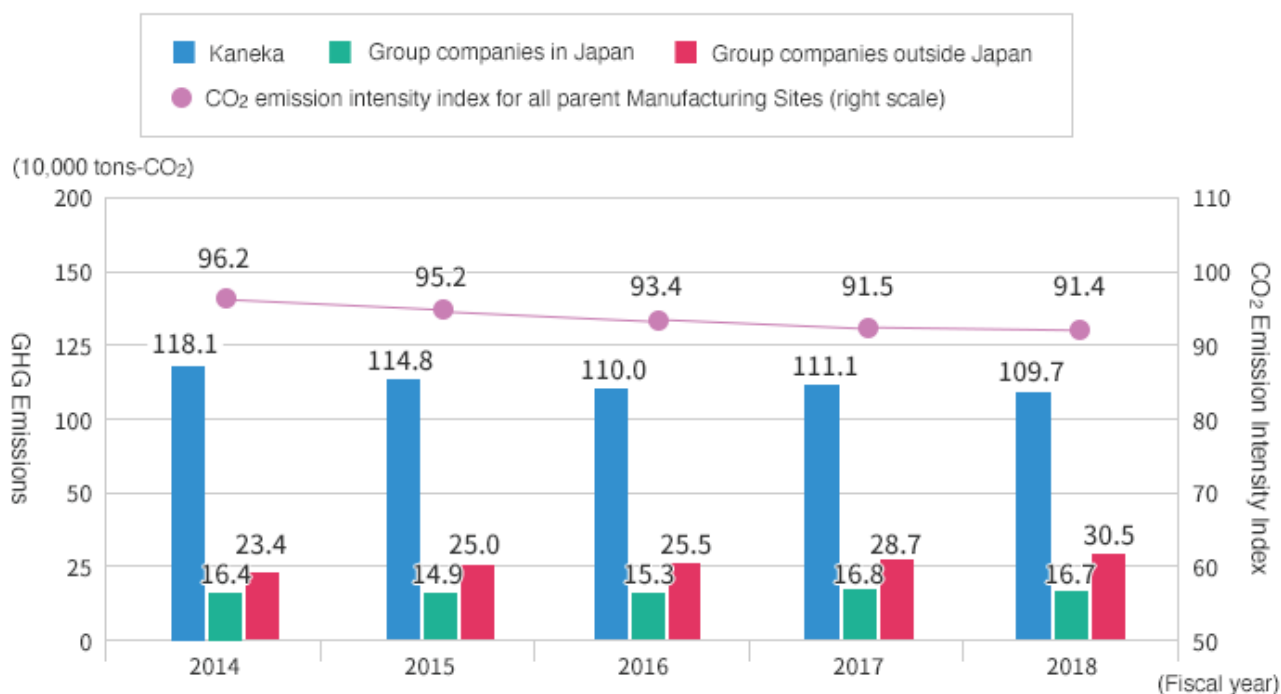
Our greenhouse gas (GHG) emissions (*4) decreased 1.3% from the previous year to 1,097,000 metric tons of CO₂, mainly through reducing the CO₂ emission coefficient of electricity.

We will continue to streamline our production processes through innovation to reduce CO₂ emissions.

*3 A ratio of energy-origin CO₂ emissions per unit of output of a product, which is indexed against the baseline year of fiscal 2013 as 100. It helps in the visualization of the impact of our activities, and was used to establish targets for fiscal 2020.

*4 GHG emissions, calculated in accordance with the Act on Promotion of Global Warming Countermeasures, are the total amount of energy-origin CO₂ emissions, non-energy origin CO₂ emissions, and the CO₂ equivalent of methane and N₂O emissions.

■ GHG Emissions and Energy-origin CO₂ Emission Intensity Index



GHG Emissions from Business Activities throughout the Supply Chain

We have calculated indirect greenhouse gas (GHG) emissions (Scope 3) associated with our business activities through supply chains. The following tables show our non-consolidated GHG emissions by scope and Scope 3 emissions calculated by category.

■ GHG Emissions by Scope (FY 2018 results at Kaneka)

Scope		GHG emissions [1,000 t CO ₂ /year] (year-on-year)
Scope 1	Direct emissions (*5)	767.4 (△5.2%)
Scope 2	Indirect emissions from energy consumption	329.2 (+9.0%)
Scope 3	Other indirect emissions (upstream/downstream)	2,081.5 (△2.4%)
Total GHG emissions		3,178.1 (△2.0%)

*5 Non-energy CO₂ emissions and equivalent CO₂ emissions of methane and nitrous oxide are included.

■ Scope 3 Emissions (FY 2018 results at Kaneka)

Category		GHG emissions [1,000 t CO ₂ /year]
1	Purchased goods/services	1,490.1
2	Capital goods	34.7
3	Fuel-and energy-related activities not included in Scope 1 or Scope 2	83.0
4	Upstream transportation and distribution	23.1
5	Waste generated in operations	3.5
6	Business travel	4.6
7	Employee commuting	0.8
8	Upstream leased assets	0.0
9	Downstream transportation and distribution	– (*6)
10	Processing of sold products	– (*6)
13	Downstream leased assets	0.0
14	Franchises	– (*7)
15	Investments	441.6
Scope 3 total		2,081.5

Amounts reported here do not fully match, due to rounding in each category.

[Calculation methods] The Scope 3 emissions were calculated in accordance with the Basic Guidelines (Ver. 2.3) on the Calculation of Greenhouse Gas Emissions Throughout the Supply Chain and the Emissions Unit Database (Ver. 2.6) for Calculation of Greenhouse Gas Emissions, etc. by Organizations Throughout the Supply Chain, published by the Ministry of Environment. Methods for calculating GHG emissions for Category 11 “Use of sold products” and Category 12 “End-of-life treatment of sold products” are under consideration.

*6 GHG emissions for this category were not calculated because we were unable to determine a rational calculation method due to the high percentage of intermediate products.

*7 GHG emissions for this category were not calculated because we have no franchise stores.

Investments in Energy-Efficient Facilities

To continue reducing energy intensity and CO₂ emission intensity, we are implementing our own environmental capital investment program, with an annual budget of 200 million yen for small and medium investments that have a relatively long payback period, through activities in three areas-global environment protection, resource conservation, and environmental impact reduction-that are priorities in Kaneka's environmental management program. In fiscal 2018 we continued allocating a large portion of this fund to projects that address climate change, including broader initiatives such as visualizing energy consumption. Based on the recognition that a certain effect has been produced, we will promote the use of this investment program for activities to reduce intensities.

■ Results of Our Own Environmental Capital Investment Program

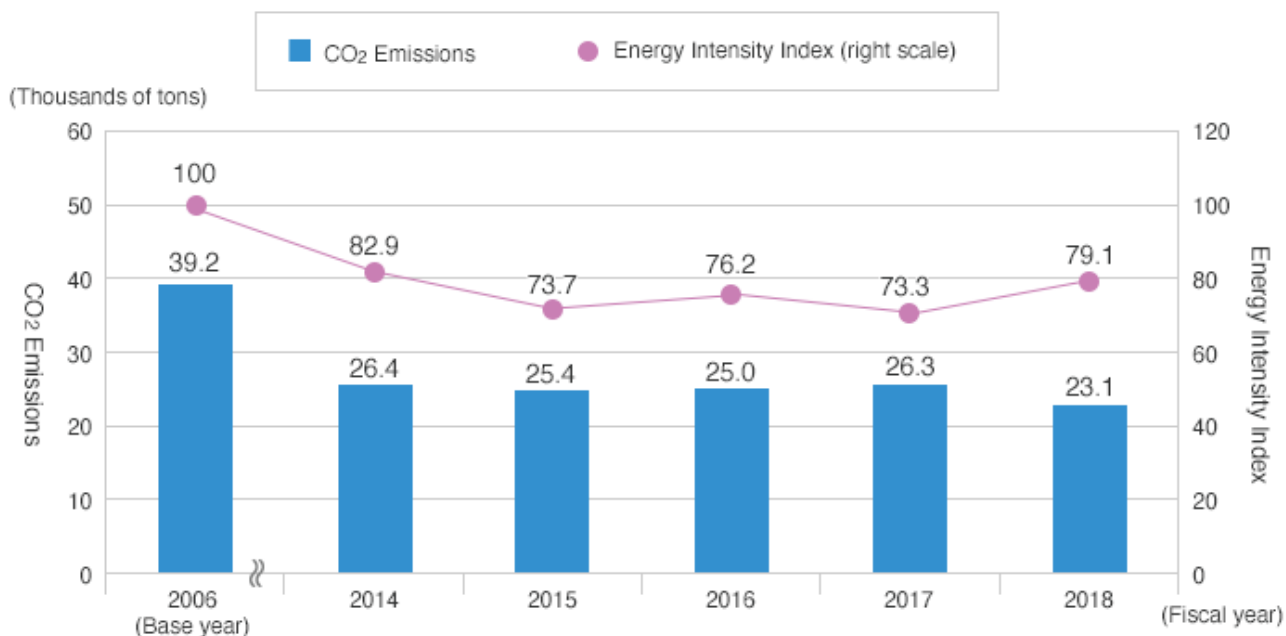
Fiscal Year	Investments	Number	Reduced CO ₂ Emission
2014	¥200 million	37	1,644 tons-CO ₂ /year
2015	¥200 million	22	1,435 tons-CO ₂ /year
2016	¥200 million	23	1,688 tons-CO ₂ /year
2017	¥200 million	15	1,654 tons-CO ₂ /year
2018	¥200 million	24	1,748 tons-CO ₂ /year

Energy-Efficiency Initiatives in Logistics

To achieve an annual 1% reduction in energy intensity as a specified consigner under the amended Act on Rational Use of Energy, we continued working plant by plant towards promoting modal shifts and joint distribution and improving cargo load ratios.

In fiscal 2018, our CO₂ emissions decreased by 3,200 tons year-on-year partly due to a reduction in the total cargo loading volume. Meanwhile, a rise in the ratio of truck transportation, such as route truck shipping, increased an energy intensity index by 5.8 points compared to fiscal 2017.

■ CO₂ Emissions and Energy Intensity Index from Logistics*8



*8 Fiscal 2006 is the base year for indexing the logistics energy intensity as 100.

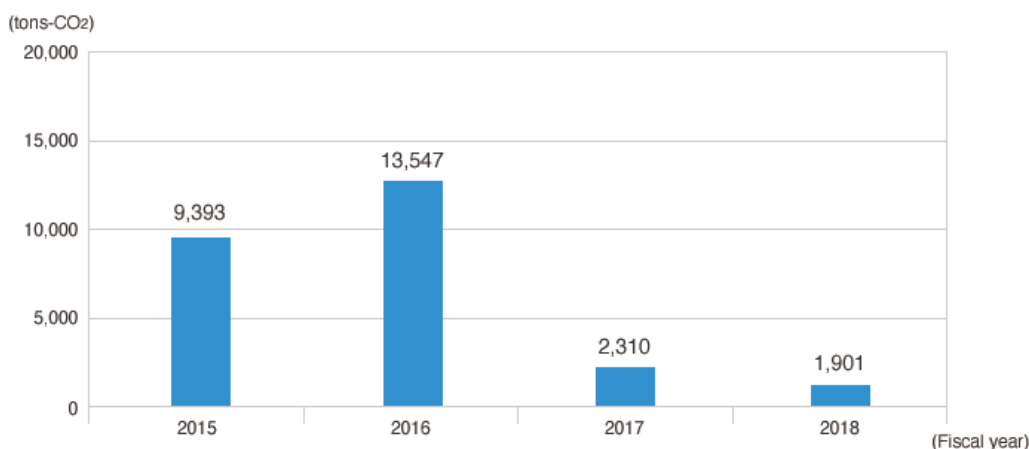
Response to the Fluorocarbons Emission Control Law

The estimated leakage amount of fluorocarbons generated in fiscal 2018 was 1,901 tons-CO₂, a decrease of 409 tons-CO₂ over the previous fiscal year, due to the replacement of aging equipment as well as strengthened equipment management, in particular, at the Takasago Manufacturing Site. No Group companies in Japan exceeded 1,000 tons-CO₂ leakage of fluorocarbons.

To reduce the estimated leakage of fluorocarbons to less than 1,000 tons-CO₂ by the end of fiscal 2020, we will update aging equipment in a planned way, selecting low-GWP (*9) equipment and promoting fluorocarbon-free production. We also inspect equipment to detect and eliminate fluorocarbon leaks at an early stage.

*9 GWP (Global warming potential) is a figure that shows, on the basis of carbon dioxide, how other greenhouse gases are capable of causing global warming.

■ Estimated Leakage of Fluorocarbons at Kaneka



Environment

Preventing Pollution and Managing Chemical Substances

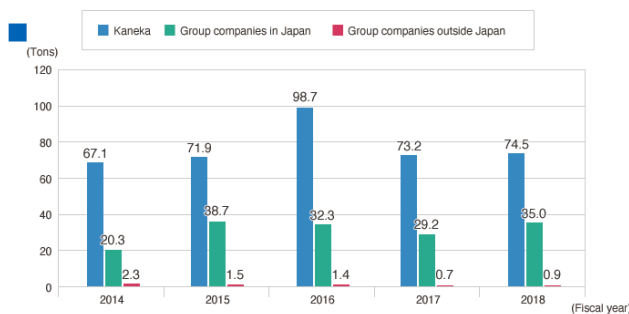
Kaneka Group works to prevent air and water pollution and to ensure appropriate management of chemical substances toxic to humans and the environment and reduce their emissions.

Preventing Air and Water Pollution

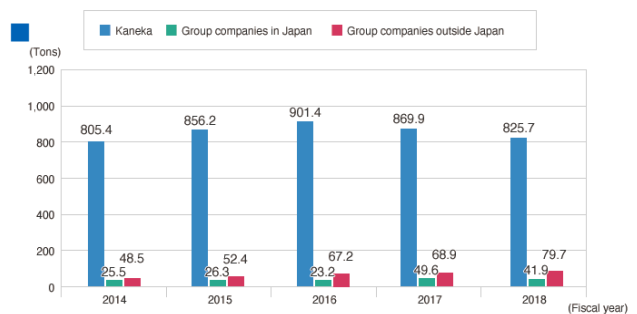
Kaneka engages in production activities in compliance with the standards specified in the Air Pollution Control Act and the Water Pollution Control Act as well as the criteria included in agreements made with local governments.

Regarding the atmosphere, SOx emission levels for Kaneka in fiscal 2018 increased, while NOx and soot and dust emissions decreased. In water, there was a decrease in COD emissions and an increase in SS emissions at Kaneka. At Group companies outside Japan, water consumption and COD emissions increased associated with a rise in production output.

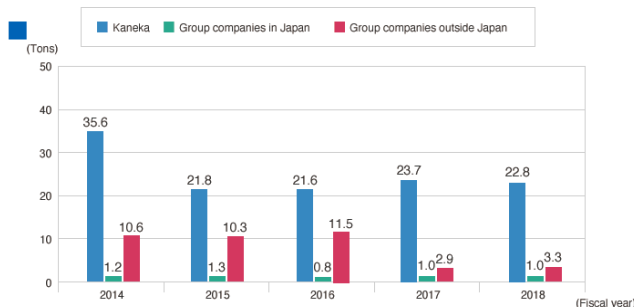
SOx Emissions



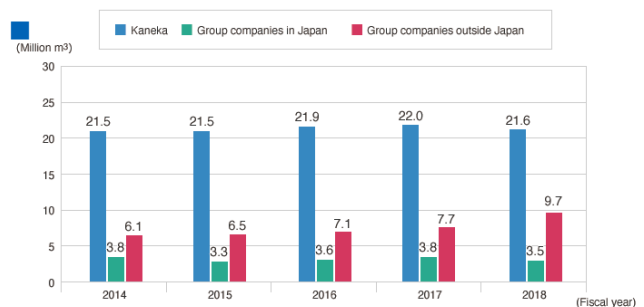
NOx Emissions



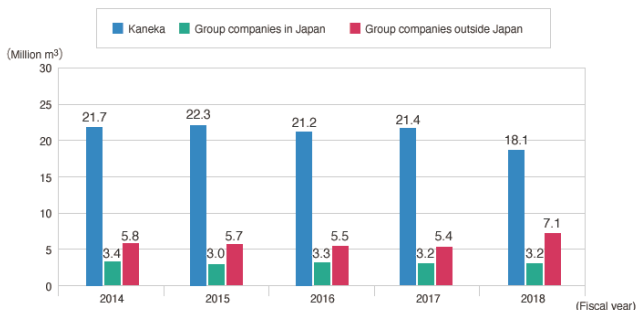
Soot and Dust Emissions



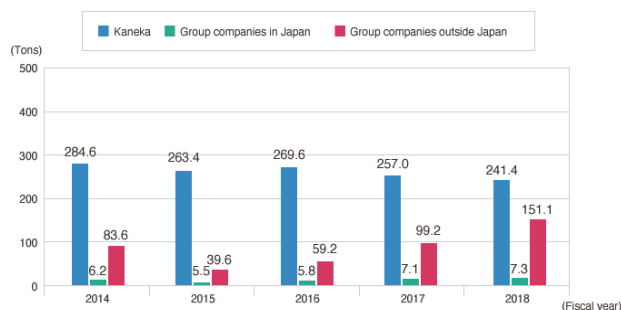
Water Consumption (*1)



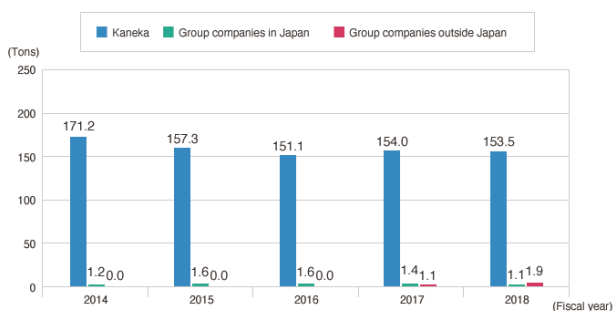
Wastewater Discharges (*1)



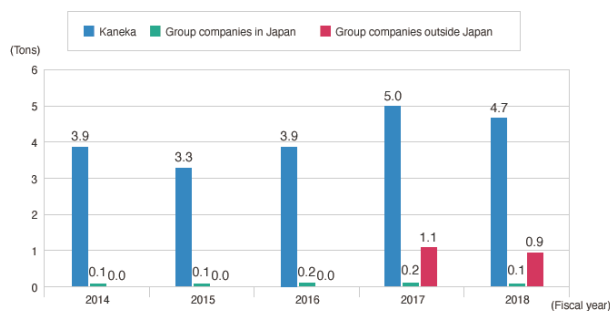
COD in Wastewater (*1)



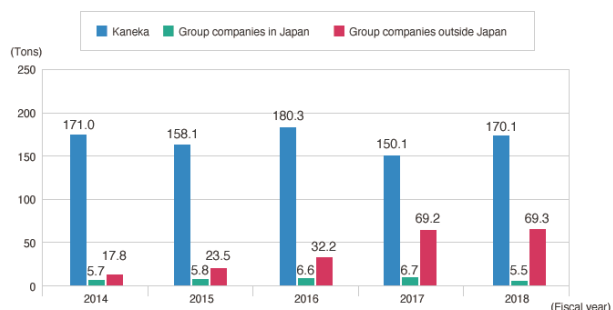
Nitrogen in Wastewater (*1)



Phosphorous in Wastewater (*1)



Suspended solids in Wastewater (*1)



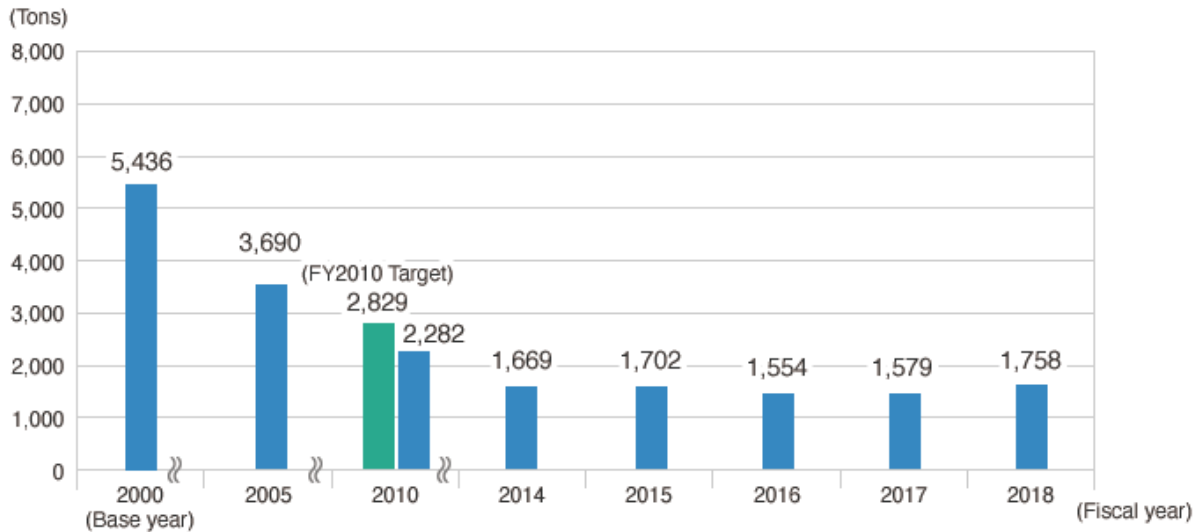
*1 From fiscal 2015, our water consumption and wastewater volume include those generated from non-manufacturing facilities other than the plant department.

Voluntary Plan to Cut VOC Discharge

We are committed to reducing the discharge of VOCs (*2), which are known to cause photochemical smog. In fiscal 2018, total discharge was 1,758 tons, an increase of 11% from the previous fiscal year, due to a rise in product production volume. We will continue our efforts to reduce VOC discharge.

*2 Volatile Organic Compounds (VOCs) are organic chemical substances that cause suspended particulate matter and photochemical oxidants.

VOC Discharge: Voluntary Plan and Performance

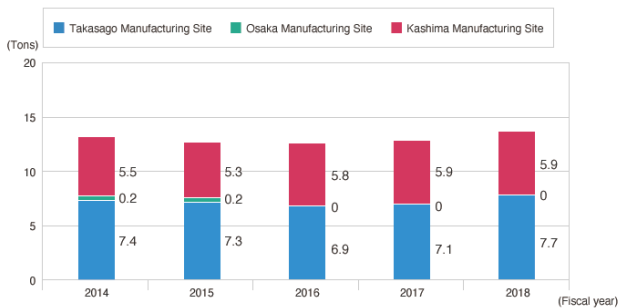


Hazardous Atmospheric Pollutants

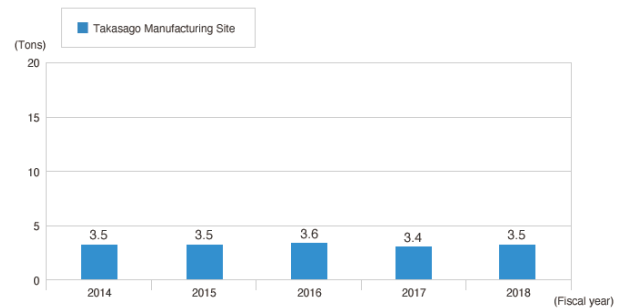
Total emissions in fiscal 2018 of six hazardous atmospheric pollutants (shown by manufacturing site in the following graphs) were 22.5 tons, which represented a year-on-year decrease of 1.5%. The difference in product type mix resulted in an increase in chloroethylene emissions. However, a decline in dichloromethane and 1,3-butadiene emissions caused by a reduction in product production volume contributed to lowering total emissions.

We will continue to make efforts to control total emissions for environmental impact reduction.

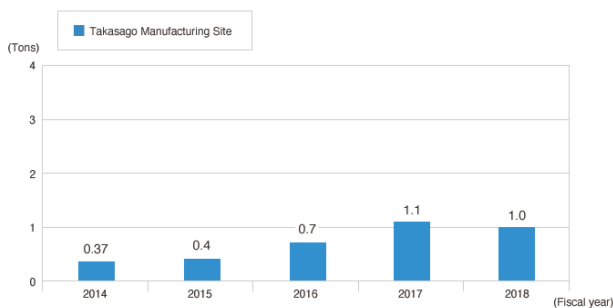
Chloroethylene



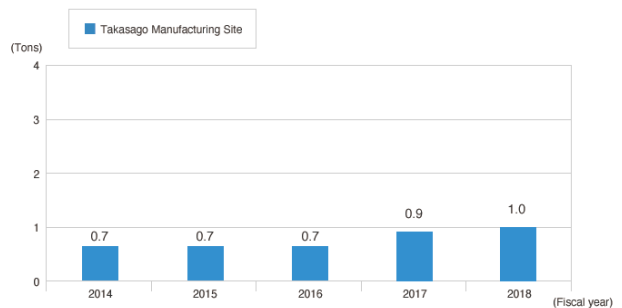
1,2-Dichloroethane



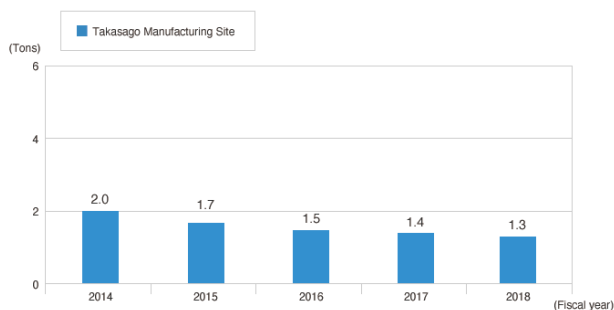
Chloroform



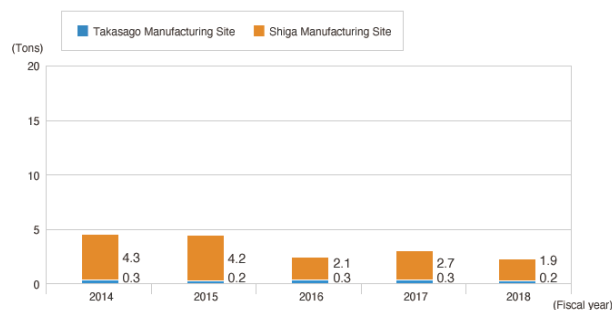
Acrylonitrile



■ 1,3-Butadiene



■ Dichloromethane



PRTR Discharge

In fiscal 2018, Kaneka's total discharge of substances subject to the PRTR was 82.3 tons, an increase of 2.2 tons from the previous fiscal year. The total discharge by Group companies in Japan was 101.4 tons, an increase of 11.4 tons compared to the previous fiscal year.

■ Fiscal 2018 Kaneka Emissions Subject to the Pollutant Release and Transfer Register Law (Kilograms)

	Designated Number under Ordinance	Chemical Substances	Fiscal 2018						Fiscal 2017
			Emissions					Transferred	Emissions
			Emissions	Discharges into Public Waterways	Discharges into Soil	Internal Landfill	Total	Total	Total
Large Discharges of 10 Substances	94	Chloroethylene (vinyl chloride)	13,500	110	0	0	13,610	960	13,010
	392	N-hexane	13,500	0	0	0	13,500	192,332	13,400
	275	Sodium dodecyl sulfate	0	8,300	0	0	8,300	0	8,400
	240	Styrene	5,800	40	0	0	5,840	7,860	5,532
	420	Methyl methacrylate	5,600	6	0	0	5,606	10	5,403
	232	N,N-dimethylformamide	3,900	1,300	0	0	5,200	310,000	4,300
	7	N-butyl acrylate	4,360	0	0	0	4,360	3,630	3,950
	134	Vinyl acetate	4,100	220	0	0	4,320	0	4,060
	157	1,2-dichloroethane	3,400	50	0	0	3,450	0	3,430
	336	Hydroquinone	0	2,300	0	0	2,300	0	2,600
Total Other than the 10 Substances Above			10,088	5,690	0	0	15,778	110,608	15,941
Grand Total for All Substances			64,248	18,016	0	0	82,264	625,400	80,026

* Of the 462 substances subject to the PRTR, Kaneka reports about 64 items.

■ Fiscal 2018 Group Company in Japan Emissions Subject to the Pollutant Release and Transfer Register Law

(Kilograms)

	Designated Number under Ordinance	Chemical Substances	Fiscal 2018						Fiscal 2017
			Emissions					Transferred	Emissions
			Atmospheric Emissions	Discharges into Public Waterways	Discharges into Soil	Internal Landfill	Total	Total	Total
Large Discharges of 10 Substances	232	N,N-dimethylformamide	54,005	0	0	0	54,005	10,340	47,020
	300	Toluene	28,731	0	0	0	28,731	445,839	21,657
	186	Dichloromethane (methylene dichloride)	11,703	0	0	0	11,703	205,897	9,663
	296	1,2,4-trimethylbenzene	2,359	0	0	0	2,359	0	2,421
	80	Xylene	2,187	0	0	0	2,187	0	4,644
	56	Ethylene oxide	1,165	0	0	0	1,165	0	616
	355	Bis (2-ethylhexyl) phthalate (DEHP)	547	40	0	0	587	74,699	105
	213	N,N-dimethylacetamide	300	0	0	0	300	15,000	1,700
	392	N-hexane	210	0	0	0	210	4,135	1,700
	127	Chloroform	150	0	0	0	150	1,400	525
Total Other than the 10 Substances Above			1	1	0	0	2	16,439	0
Grand Total for All Substances			101,358	41	0	0	101,399	773,749	90,050

* Of the 462 substances subject to the PRTR, group companies in Japan reports about 31 items. Amounts reported here may not fully match, due to rounding.

CHECK & ACT

We are working to reduce environmental impacts on air and water quality and ensure rapid response to any abnormality. The increase in discharge by Kaneka and Group companies in Japan is mainly due to increased production of products using N,N-dimethylformamide. We will continue our efforts to reduce the discharge of chemical substances.

Environment

Reducing Waste and Recycling Resources

Through pursuing the 3Rs (reduce, reuse and recycle) aimed at the reduction and recycling of industrial waste from our operations, Kaneka has been able to achieve zero emissions (*1) for 13 consecutive years. We are also working toward all group companies in Japan being able to achieve zero emissions.

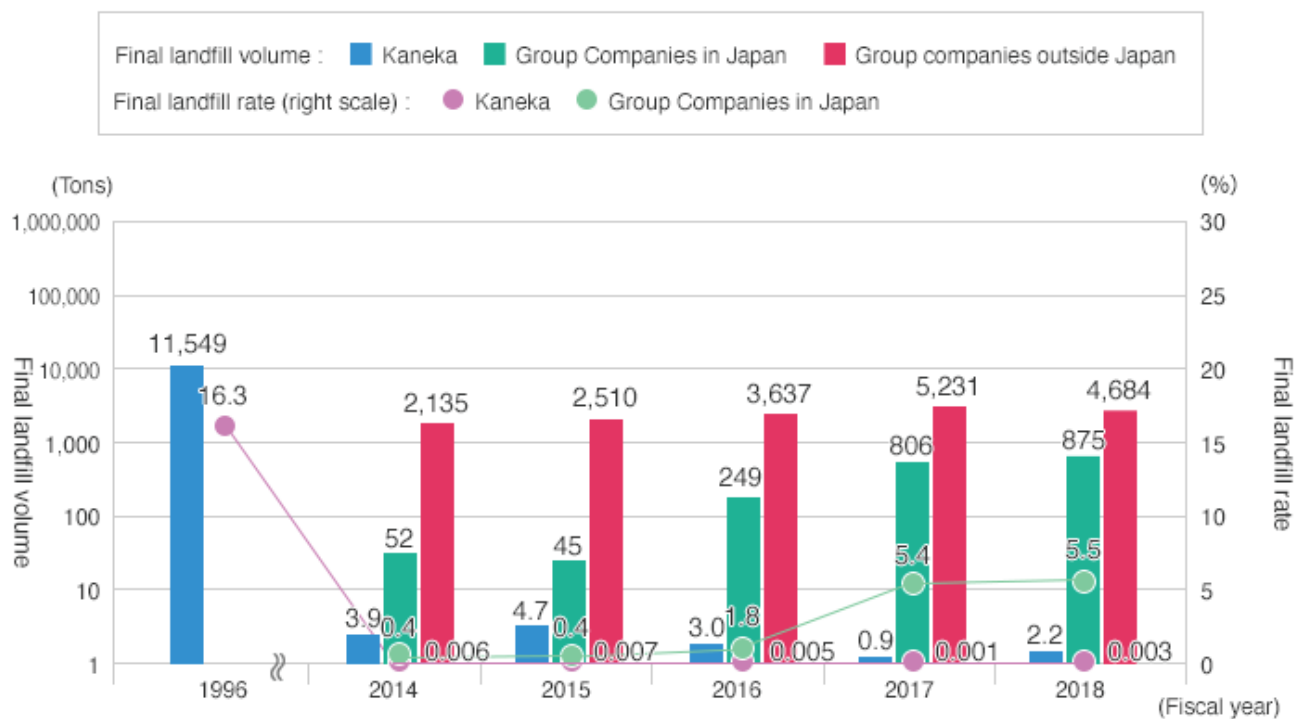
*1 Zero emission defined by Kaneka: The final landfill waste must be less than 0.5% of the generated waste.

Cutting Waste Sent to Landfill

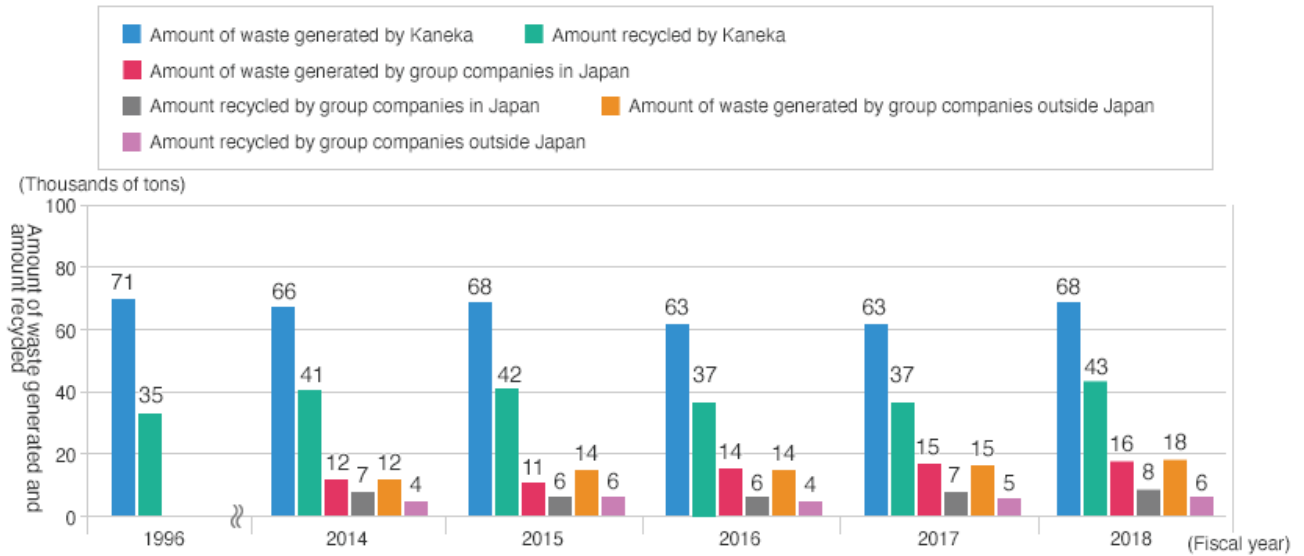
We effectively achieved zero emissions in fiscal 2018, with a final landfill volume for Kaneka of 2.2 tons, equivalent to a final landfill rate of 0.003%.

The final landfill rate of 46 Group companies in Japan in fiscal 2018 failed to achieve zero emissions, with a rate of 5.5%, since emission improvements were not fully realized partly due to China's trade embargo on waste plastics.

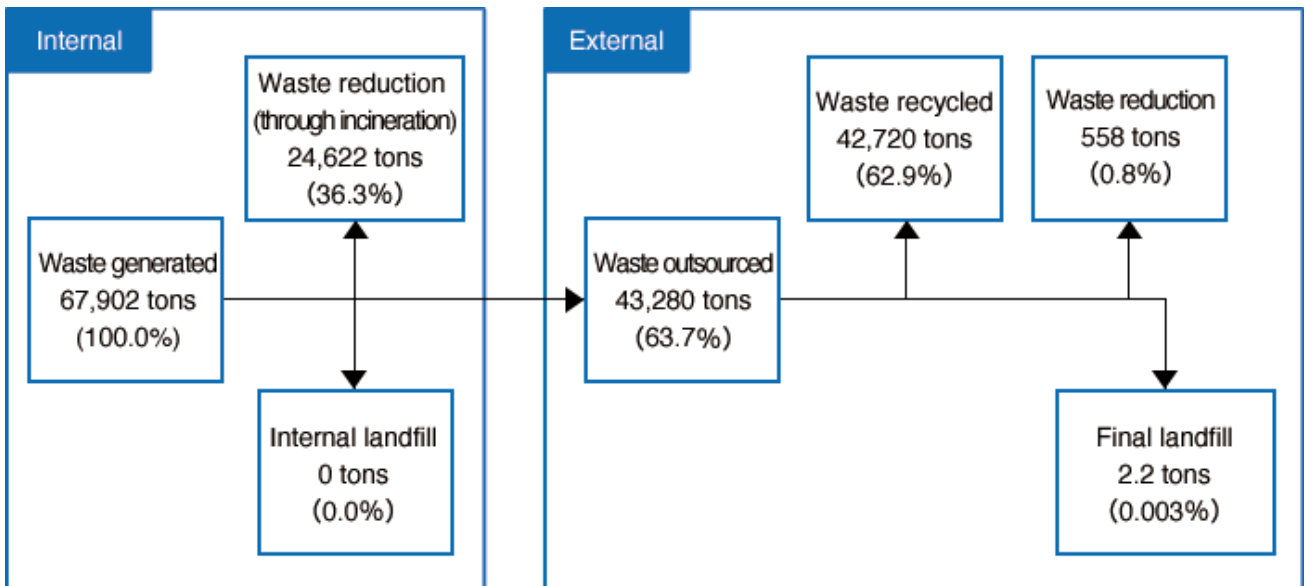
■ Volume and Ratio of Waste sent to Landfill



Waste Generated and Recycled



Waste Flow: From Generation to Landfill (FY 2018 actual)



Proper Disposal of Industrial Waste

We conduct regular site visits of our waste processing contractors, and carry out inspections based on a checklist to confirm that waste is being processed in the proper manner.

3R Initiatives

Because reducing waste leads to improving global sustainability by means of resource savings, cost reduction, as well as CO₂ emissions reduction, Kaneka is pursuing waste reduction on a company-wide basis.

We at Kaneka and Group companies in Japan are pursuing activities at each of our production facilities, mainly through the "3R" approach to achieve waste reduction and recycling of materials.

We also facilitate continuous improvement activities through process analysis using Material Flow Cost Accounting (MFCA).

Environment

Biodiversity

Considering the impacts of our businesses on ecosystems, we at Kaneka strive to develop technologies, materials and products that have less environmental impacts, as well as to mitigate environmental impacts of our production.

As part of our corporate social responsibility efforts, we also collaborate with stakeholders outside the company in biodiversity conservation activities.

Partnership for Biodiversity Conservation

We join the following initiatives.

- Promotion Partners of the Declaration of Biodiversity by Keidanren
- Japan Business and Biodiversity Partnership

Takasago Manufacturing Site “Kaneka Forestry for the Future”

Since 2012, we have been involved in the Kaneka Forestry for the Future project aimed at preserving a private forest. Employees at the Takasago Manufacturing Site have helped to protect a forest of roughly 15 hectares in Taka Town, Hyogo.

Since 2013, training of newly hired employees has been part of the project. Assisting each other on the forest terrain in cutting and transporting timber, the participants build solidarity and teamwork.

In April 2018, 59 employees, mainly newly hired, carried out tree thinning, and 53 employees and their family members participated in another session in November. The carbon sink since the start of the project amounts to 1.93 tons-CO₂. We will continue this private forest preservation project.



Timber felling through cooperation among newly hired employees



Osaka Manufacturing Site “Settsu-no-mori Kaneka Biotope”

Since 2012, we have operated the Settsu-no-mori Kaneka Biotope(*) on the premises of the Osaka Manufacturing Site in collaboration with the Settsu Firefly Society, to create a firefly habitat in Settsu City. When fireflies appear, we hold a firefly viewing gathering, inviting local residents.

In 2018, the biotope was open to the public for firefly viewing from May 19 to 27, and 1,169 local residents enjoyed the dance of the fireflies in flight. From 2017, we have held an ensemble concert by the Japan Century Symphony Orchestra at the Osaka Manufacturing Site during the firefly viewing period. We will continue our activities as a plant open to the local community.

* Biotope: A place where organisms live as they do in nature. In human environments such as cities, biotopes are artificial environments created to regenerate and preserve a natural habit.



An adult firefly observed in the biotope at the Osaka Manufacturing Site



“Firefly Evening Concert”

Shiga Manufacturing Site “Walnut School”

We have joined the Steering Committee of the Walnut School launched to conserve the Konooka Biotope, located next to the Shiga Manufacturing Site.

The Konooka Biotope is a habitat of diverse creatures. Established as a collaborative effort by Shiga Prefecture, Otsu City, and local community members including employees at the Shiga Manufacturing Site, the Walnut School works to preserve this precious natural environment for future generations. Its regular activities include grass mowing, sidewalk maintenance, and the updating of tree signs. It also holds seasonal nature observation gatherings three times a year. The gatherings provide valuable learning opportunities for children to observe rare plants, wild birds, and insects in the biotope and to understand its importance. We will continue to contribute to the conservation of the beautiful natural environment of Lake Biwa.



Nature observation gathering