

# 2019

## Safety & Environmental Report



**TAIYO YUDEN**

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## Editorial Policy

<b>Why this Report was Published</b>	The Taiyo Yuden Group strives for perpetual growth while fulfilling its corporate social responsibilities. Making efforts toward improving safety and the environment is an important social responsibility at Taiyo Yuden, so we promote such activities on a global scale. Every fiscal year, we publish a Safety and Environmental Report presenting our goals, our efforts, major results, and other details in a comprehensive yet easy to understand format.
<b>Intended Readership</b>	This publication assumes a target readership consisting not just of customers and clients, but also local communities in the vicinity of our sites, stockholders, investors, people involved in environmental activities or occupational health and safety, NGOs, students, group employees, and a wide range of other stakeholders. We also publish this English version to make the contents available to readers overseas.
<b>Referenced Guidelines</b>	This report follows the Environmental Reporting Guidelines (2018 edition) issued by the Japanese Ministry of the Environment. We have listed the core indicators of environmental performance while referring to the GRI standard. Mixing in charts and figures, it outlines the Taiyo Yuden Group's environmental impact describes our management systems, spotlights current issues and reports on specific measures for improving that impact.
<b>Publication on our Website</b>	This report is published on the Taiyo Yuden website, in consideration of effective use of resources, etc. We hope that this report will help you gain a deeper understanding of our environmental, health, and safety activities, and be used as a reference for making an objective judgment of the Group.  Reference : The Taiyo Yuden website <a href="http://www.ty-top.com/">http://www.ty-top.com/</a>

## Scope of Disclosure

<b>Organizations Covered by this Report</b>	<p>This report covers TAIYO YUDEN CO., LTD. and its domestic and overseas subsidiaries and affiliates. Safety and environment data covers the following the Taiyo Yuden Group members: six domestic sites, eight domestic group companies, and five overseas group companies.</p> <p><b>[Within Japan]</b>  <b>TAIYO YUDEN CO., LTD.</b>            Takasaki Global Center / Haruna Plant / Nakanojo Plant / Tamamura Plant / Yawatabara Plant / R&amp;D Center / (Hongo Photovoltaic Power Plant)</p> <p><b>Consolidated Subsidiaries</b>            TAIYO YUDEN CHEMICAL TECHNOLOGY CO., LTD. / TAIYO YUDEN TECHNO SOLUTIONS CO., LTD. / FUKUSHIMA TAIYO YUDEN CO., LTD. / NIIGATA TAIYO YUDEN CO., LTD. / TAIYO YUDEN ENERGY DEVICE CO., LTD. / WAKAYAMA TAIYO YUDEN CO., LTD. / TAIYO YUDEN Mobile Technology Co., Ltd. / Kankyo Assist Co., Ltd.</p> <p><b>[Outside Japan]</b>  <b>Consolidated Subsidiaries</b>            South Korea: KOREA TONG YANG YUJUN CO., LTD.</p> <p>China: TAIYO YUDEN (TIANJIN) ELECTRONICS CO., LTD. / TAIYO YUDEN (GUANGDONG) CO., LTD.</p> <p>Philippines: TAIYO YUDEN (PHILIPPINES), INC.</p> <p>Malaysia: TAIYO YUDEN (SARAWAK) SDN. BHD.</p>
<b>Period Covered by this Report</b>	This Report focuses on our performance from April 1, 2018 to March 31, 2019 (Date of any activities which have taken place outside this period are specified).
<b>Date of Issue</b>	July 2019 (Previous Issue: July 2018; Next issue scheduled for July 2020)

# Safety and Environmental Management System 2-1

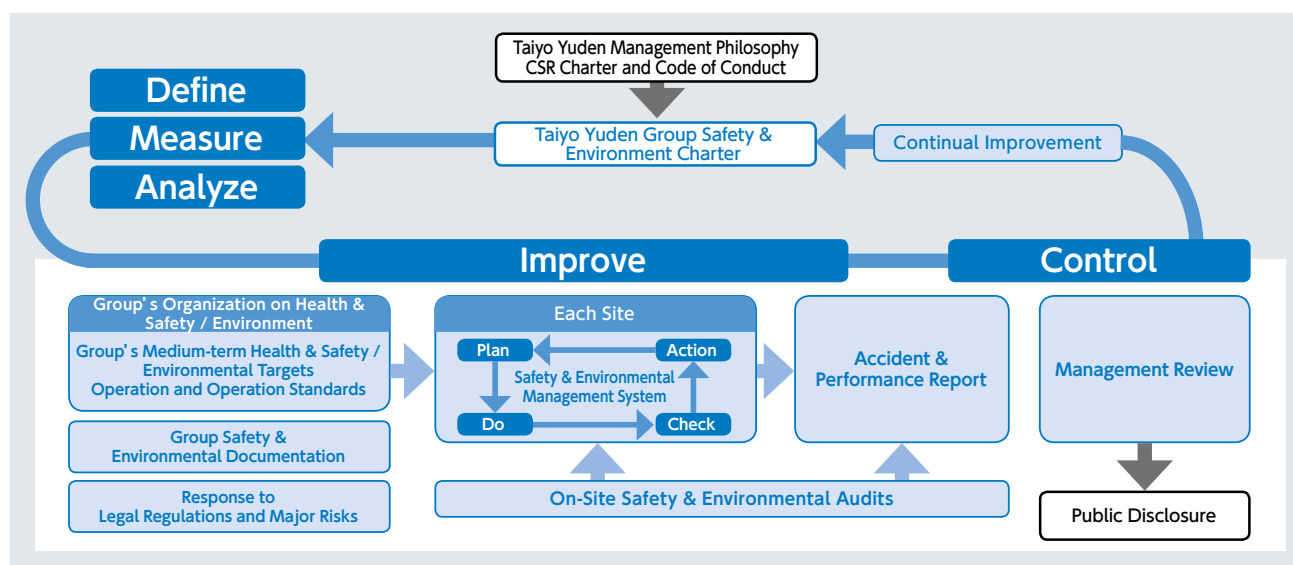
02

Our group-wide Safety and Environmental Management System keeps individual activities proceeding toward common goals under a common philosophy.

## System Overview

This management system consists of long- and short-cycle activities.

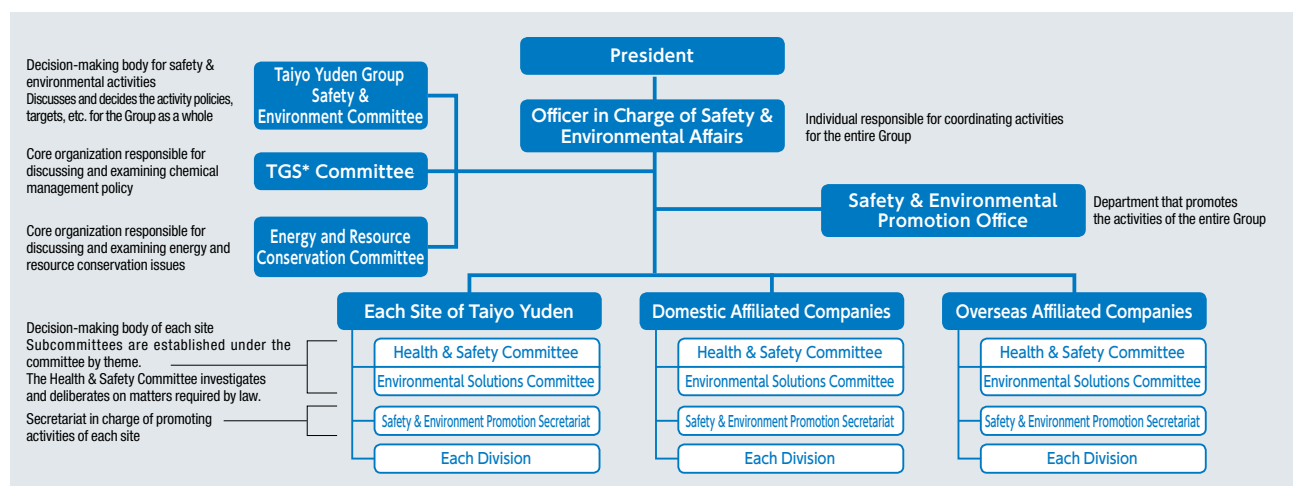
In the long-cycle activities, which are designed for the entire group, we are making continuous improvements based on common goals and criteria by checking achievements based on reports about site audits and from sites and by reviewing the management system. For site-specific short-cycle activities, we have an ISO 14001-compliant management system and the Occupational Health and Safety Management System (OHSMS) in place.



## Promotion Structure

The officer in charge of safety and environmental affairs appointed by the President has overall responsibility for building and managing the promotion structure for Taiyo Yuden's Safety and Environmental Management System.

The Taiyo Yuden Group Safety and Environment Committee, the Taiyo Green Strategy (TGS) Committee, and the Energy and Resource Conservation Committee debate and decide policies and issues to be addressed. Each manager of sites then converts his/her decisions into actual plans matching the characteristics of each site, and takes charge of publicizing, enforcing and promoting these concrete targets.



\* TGS: Taiyo Green Strategy

# Safety and Environmental Management System 2-2

03

## Certification Acquisition Status

The Taiyo Yuden Group is ISO 14001 certified for its production sites and development centers. Also, as the group became ISO 45001 certified, it returned the OHSAS 18001 certificate instead of subjecting to the Validated Assessment Program (VAP) audit by the Responsible Business Alliance (RBA) in line currently with the set plan.

### List of Certifications Acquired

Location	Name of Sites	Acquired ISO14001 Certification	Certification authorities
Japan	TAIYO YUDEN CO., LTD. Takasaki Global Center, Haruna Plant, Nakanojo Plant, Tamamura Plant, Yawatabara Plant, R&D Center	<b>4270140</b> (as of Oct. 1998) Collectively certified in Japan	BV
	TAIYO YUDEN CHEMICAL TECHNOLOGY CO., LTD.		
	TAIYO YUDEN TECHNO SOLUTIONS CO., LTD.		
	FUKUSHIMA TAIYO YUDEN CO., LTD.		
	NIIGATA TAIYO YUDEN CO., LTD.		
	TAIYO YUDEN ENERGY DEVICE CO., LTD.		
	WAKAYAMA TAIYO YUDEN CO., LTD.		
	TAIYO YUDEN Mobile Technology Co., Ltd. Kankyo Assist Co., Ltd.		
South Korea	KOREA KYONG NAM TAIYO YUDEN CO., LTD.	<b>20BK00256-UK</b> (as of Mar. 2002)	BV
China	TAIYO YUDEN (TIANJIN) ELECTRONICS CO., LTD.	<b>CN08/10665</b> (as of Aug. 2008)	SGS
	TAIYO YUDEN (GUANGDONG) CO., LTD.	<b>CNGZ301353-UK</b> (as of Dec. 2001)	BV
Philippines	TAIYO YUDEN (PHILIPPINES), INC.	<b>PH13/0920.00</b> (as of Nov. 2001)	SGS
Malaysia	TAIYO YUDEN (SARAWAK) SDN. BHD.	<b>EMS00226</b> (as of Oct. 2002)	SIRIM

# Safety and Environmental Audits

04

Triple audits evaluate each site's compliance, accident risk management, and the environmental impact situation aimed at producing continuous improvement.

## External Audits

ISO14001 certification audits by certification authorities

Sites with ISO14001 certification underwent the audits required to update or maintain such certification. These audits uncovered 4 nonconformities. The root causes were analyzed and corrective action was promptly taken in response to each issue. The nonconformities were minor issues relating to our management systems, and were not directly linked with environmental pollution or occupational accidents.

Note that, RBA-VAP audits, which were already being performed at overseas production sites, began at Japanese sites in FY2018.

### Number of Nonconformity Instances Found with External Audits



### Nonconformity Examples

#### Nonconformity Examples and Details

Personal protective equipment was not put on as specified by the SDS, and some were unused.

Periodic inspection to confirm proper functioning of safety belts was not being performed.

#### Corrective/Improvement Measures

We checked the SDS for the chemical substances used and revised the rules to eliminate the personal protective gear shortages.

We set the inspection items and frequency to confirm the proper functioning of safety belts and performed checks.

## Internal Site Audits

Audits of site safety and environmental activities at regularly scheduled intervals allow us to compare sites.

Domestic sites: Once every two years  
Overseas sites: Once every three years

In FY2018 we performed site audits to examine the implementation status of the safety, health, and environmental requirements specified by the RBA Code and the operational status of our management systems.

In each audit, auditors checked documents and while onsite examined whether notifications were being submitted to conform to certain laws and regulations, use of qualified personnel, management of fire prevention systems, accessibility of evacuation routes, emergency preparedness and responses, chemicals management, waste product and water management, and so on.

The audits revealed insufficient treatment of expecting and nursing mothers, management of evacuation routes, first-aid box management, waste product management, and so on.

Countermeasures were implemented and validated for inadequacies and nonconformities found during the internal site audits.

We aim to improve the level of the health, safety, and environmental protection activities for the whole group by incorporating societal requirements globally in a timely manner and sharing the results after benchmarking products from all sites.

### Issue Examples

Dangerous or hazardous assignments for which handling by expecting or nursing mothers should be limited were not sufficiently identified.

Evacuation route maps were not sufficiently created.

First-aid boxes were missing some items or were not sufficiently inspected.

## Internal Audits

Audits targeting site departments on observance of safety and environment laws, target achievement, and performance.

Once or twice every year

All sites conducted internal audits of their departments in accordance with their management systems. Priority areas were determined for each site, and 38 non conformities were uncovered as a result of conducting internal audits (at sites in Japan). Corrective action was completed in all cases without delay, and after a follow-up check, it was reported to the managers that the management system has been effective in complying with the Taiyo Yuden Group's policies and goals.

## Other Audits

### On-site inspection of waste disposal contractors (Sites in Japan)

During FY2018, we inspected and audited 27 companies (one collection and delivery company; seventeen collection, delivery and intermediate processing companies; and nine intermediate processing companies). As a result, it was confirmed that all inspected operators are processing and disposing of waste appropriately. The operators have been classified into three ranks from the results of these inspections, with the frequency of future inspections varying depending on the rank of the operator.



# Safety and Environmental Risk Management

05

Various types of regularly scheduled training are implemented to respond to sudden accidents, disasters, and other risks, with the objectives of early discovery, rapid response, prevention and mitigation. The Taiyo Yuden Group reconfirms appropriate procedures and strives for continuous improvement.

## Firefighting Training



### Haruna Plant

Participated the Fire Extinguisher Division of the Initial Fire Response Competition and demonstrated the same level of firefighting skills as in routine drills. (October 2018)



### Yawatabara Plant/TAIYO YUDEN TECHNO SOLUTIONS

Conducted a water-discharge exercise using an outdoor fire hydrant. (May 2018)



### TAIYO YUDEN (TIANJIN) ELECTRONICS

Conducted an early-stage fire extinguishing exercise using dry chemical extinguishers. (November 2018)

## Emergency Training for Spillage of Chemical Substances



### R&D Center

Conducted training on isolating a gutter and collecting a chemical substance for a scenario in which a chemical substance has leaked into a gutter. (March 2019)



### TAIYO YUDEN Mobile Technology

Conducted training on collecting leaked plating effluent for a scenario in which it leaked during the recovery process. (June 2018)



### TAIYO YUDEN (SARAWAK)

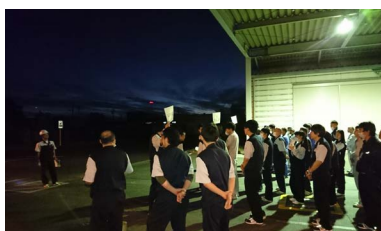
Conducted training on preventing a leaked chemical substance from spreading for a scenario in which a container fell over and leaked while in transport. (August 2018)

## Evacuation and Medical Emergency Training



### Nakanojo Plant

Conducted first-aid training under the guidance of the fire department. Participants learned cardio-pulmonary resuscitation and how to use an AED. (May 2018)



### FUKUSHIMA TAIYO YUDEN

Conducted a nighttime evacuation drill to develop abilities to quickly evacuate in the case of a fire at night. (September 2018)



### TAIYO YUDEN (PHILIPPINES)

Conducted an emergency procedure and transportation drill to help the injured. (November 2018)

## Removing Soil Contamination

We completed our soil and ground water contamination surveys and made clean-up efforts following the Japanese Ministry of the Environment guidelines in 2003. No surveys were conducted in FY2018.

## Environmental Accidents

No accidents that could affect the surrounding environment have occurred.

# Employee Enrichment through Safety and Environmental Training

06

We provide a variety of training programs covering both general and specialized knowledge to promote employees' awareness of preventing occupational injury and illness, as well as active participation in environmental conservation.

## Training Structure

Name	Category	Purpose	Main Subjects
General Training	Awareness	Raising new recruits' awareness of occupational health & safety and environmental preservation, and ensuring they understand environmental problems pertinent to companies	General theory of Safety & Environment / Status of Safety & Environment at the Taiyo Yuden Group
		Deepening all employees' understanding of the Taiyo Yuden Group Safety and Environment Charter and Course of Action and teaching them the skills to act accordingly	Management system (including the Safety and Environment Charter) / Mental health
		Understanding potential hazards and environmental impact with regard to divisional health and safety/environmental activities and work	Division activities / Matters for compliance in work
Health & Safety Training	Abilities	Deepening understanding of the role of the duty for employee safety required by legal regulations and teaching foremen skills to instruct their subordinates regarding health and safety.	Role of the General Manager of Health and Safety / Role of management / Role of foreman / Chemical substance management / Hazardous material management
		Teaching of specialized skills to operators of forklifts, cranes, and other heavy equipment, as well as managers of processes that handle organic solvents and the like, and employees involved in these tasks	Workplace restricted duties / Training for specific tasks / Prevention of static electricity accidents
		Teaching the skills to recognize risks and creating a safe and sanitary workplace	Risk assessment / Health and Safety targets / Cases of Health and Safety accidents and their countermeasures
Environmental Training		Teaching special skills to managers and relevant employees involved with equipment and facilities for which a legal notification is required	Management to prevent deterioration of water quality / Management to prevent air pollution / Waste management
		Training skills to integrate business activities with environmental activities in order to balance an improvement in our environmental impact with improved resource productivity	Chemical substances and their environmental impact / Environmental targets / Cases of environmental improvements / Causes of environmental accidents and their countermeasures

## Training Examples

### General Training

#### Holding events associated with health and safety

At all sites, we hold various events associated with health and safety, providing employees with opportunities to raise their awareness and improve their skills. These events include locomotion tests to check physical capabilities such as walking and standing, safe driving classes, and health classes with a salad bar.



Locomotion test



Health class with a salad bar

### Occupational Health and Safety Training

#### Forklift training

We invited external instructors to talk about examples of actual accidents, teach inspection methods, and provide training on forklift operation.



Forklift training



Laser safety workshop

#### Laser safety workshop

To prevent accidents caused by lasers, we provided a lesson to teach the effects of lasers on the human body and how to handle laser devices safely.

### Environmental Training

#### Rainwater discharge management education

We educated employees about checking rainwater routes and emergency isolation points, anti-pollution measures for rainwater gutters, and scheduled inspection and emergency procedures.



Rainwater discharge management education (onsite)



Rainwater discharge management education

# Environmental Accounting

07

The Taiyo Yuden Group promotes an effective environmental management by adopting environmental accounting to make clear what resources our domestic sites apply to their environmental preservation activities.

## Environment Maintenance Costs

Type of cost		Expenses (million yen)	Investment (million yen)	Main items
Business unit area costs		951	295	
Breakdown	Pollution prevention	543	140	Monitoring and measurement of atmosphere, water quality, noise, and vibration; emergency preparedness and response
	Conservation of global environment	193	155	Curbing emission of greenhouse gases; curbing emission of ozone-depleting substances; improvements in water quality; exhaust gas cleaning; energy saving; resource saving
	Resource recycling costs	215	—	Waste management, and outsourcing of waste treatment; reduction of waste; recycling
Upstream / downstream business activities		0	—	Activities to improve the environmental impact of products, green procurement
Management activity costs		489	—	Building and operating an EMS; surveillance audits; environmental training; costs for operating secretariat; department operations costs
R&D		312	—	R&D costs to improve the environmental impact of product processes etc.
Social activities		9	—	Donations to environmental groups; participation in communities' global environmental preservation events
Response to environmental damage		0	—	
Total		1,761	295	

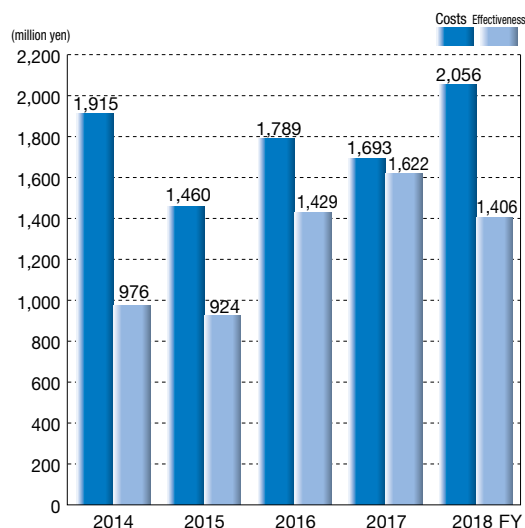
## Environment Maintenance Effectiveness

We calculate the economic effects only for those activities clearly improving our environmental impact.

Type of effectiveness	Economic effect (million yen)	Effects on amounts*	Main items
<b>Energy saving</b>	79	1,711 kL	Improvement in productivity; improvement in energy management method
<b>Conservation of resources</b>	22	35t	Reduction in amount of chemical substances used through improvement in process yield etc.
<b>Reduction in waste, and recycling</b>	1,305	2,865t	Improvement in recycling rate
<b>Total</b>	<b>1,406</b>		

\*Effects on amounts\* indicate the calculated difference with the case where no activities are conducted to improve our environmental impact.

## Trends in Environmental Accounting



### Environmental Accounting Standards

1. The sum total of the costs for complying with environment-related laws and regulations, the costs incurred purely for the purpose of improving our environmental impact, and the EMS operation costs are calculated. However, in cases where environmental preservation costs partially overlap the costs for other purposes, the latter shall be deducted and the balance shall be applied.
2. Depreciation costs shall be the current fiscal year's depreciation expenses at the environmental conservation facilities.
3. If a clear-cut distinction cannot be made between the environmental cost and that for other purposes, if 50% or more of the content is environment-related, the full amount can be counted as the environmental preservation cost.
4. The cost-effectiveness by saving energy is yielded from the reduction of either the rated dissipation or the operating time or both.
5. The cost-effectiveness by reducing and recycling waste is calculated as follows:

**Lowered costs through reducing waste and recycling =**

**[Unit cost of waste treatment in the prior fiscal year (JPY/ton) – Unit cost of waste treatment in this fiscal year (JPY/ton)] × Amount of waste generated (tons)**



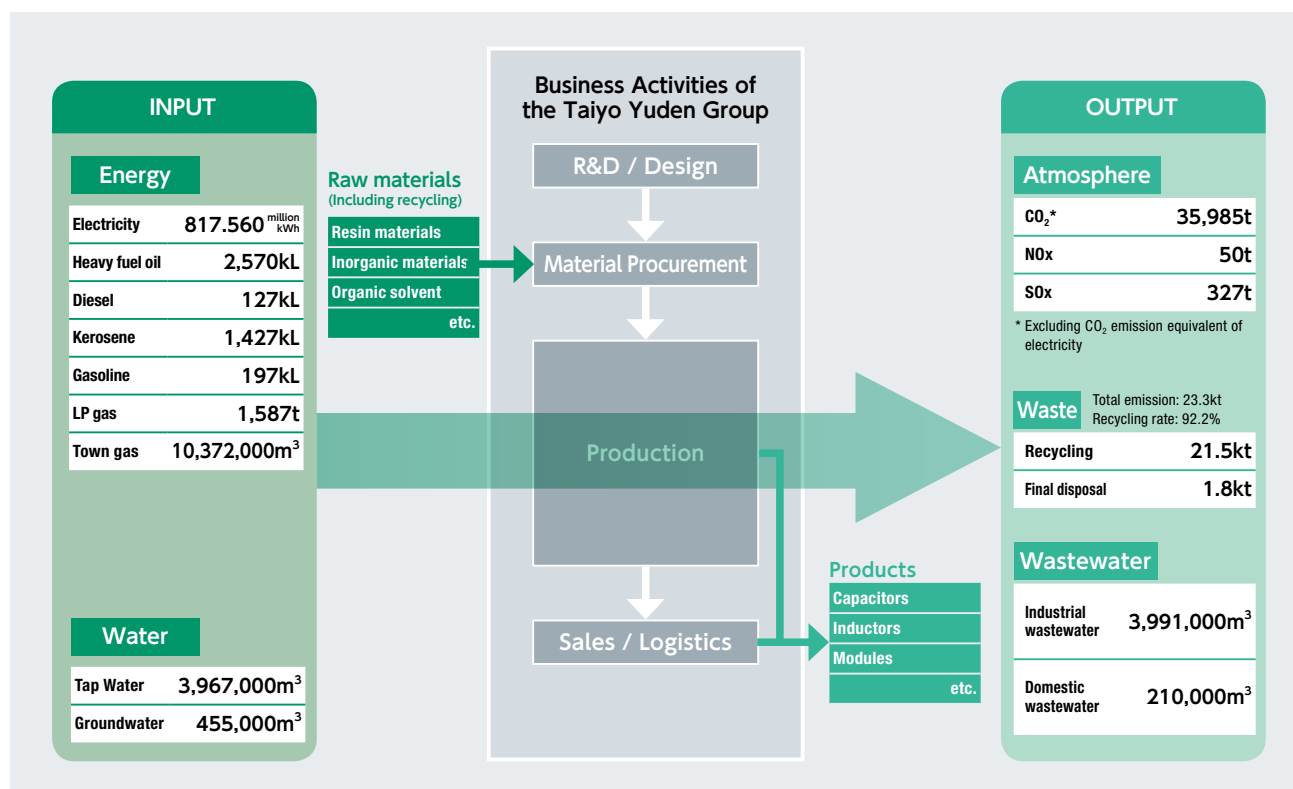
# Determining Environmental Impact of Corporate Activities

08

Detailed understanding and analysis of the environmental impact of corporate activities is a prerequisite to devising various measures to improve this.

## FY2018 Material Balance

The Taiyo Yuden Group primarily produces electronic components for delivery to our customers, set manufacturers. These electronic components have a life cycle with only a small environmental impact during use. The bulk is during production, with the main environmental impact arising from energy and water consumption, emissions (including CO<sub>2</sub>) in the course of manufacture, waste and wastewater. The Taiyo Yuden Group is striving to improve our environmental impact by first identifying and analyzing in detail this environmental impact and then taking such measures as minimizing the resources applied and conserving other energy and resources by improving production processes. The Taiyo Yuden Group products are used in electrical and electronic equipment, automobiles, and other products which become waste once their product lifetime is over. We are therefore also striving to remove hazardous substances from these products.



### Reasons for Changes from FY2017

In FY2018, electricity and city gas usage increased due to the increase of production volume both domestically and overseas.

# Achievement Levels for Medium-Term Environmental Targets

09

We set medium-term environmental targets for the Group overall.  
Our environmental impact improvement efforts are implemented over all sites.

## Taiyo Yuden Group Environmental Targets and Results

We are aiming to reduce our environmental impact over the five-year period from fiscal 2016 to 2020. We first medium-term environmental goals on a per-project basis, and then set sub-goals on a per-site basis and then on a per-department basis so that each business unit can actually work on specific activities.

Medium-Term (FY2016 to FY2020) Environmental Targets			Achievements	Evaluation
Environmental risk management	Global	Compliance with applicable environmental laws and regulations	All applicable legal requirements are satisfied	○
		Maintain zero accidents that affect the ecosystem and carry out ongoing training	No accident has occurred that may affect an ecosystem. We are regularly conducting emergency training.	○
Contributing through environmentally friendly products	Global	Develop "smart products"	We are continuously developing downsized products and other smart products that help alleviate environmental impacts.	○
		Reduce environmental impact per each product	We have reviewed the production conditions, methods, and equipment to reduce the environmental load per product.	○
		Regulatory compliance for chemicals contained in products (RoHS, ELV, REACH)	Requirements for the amounts of chemicals contained in products are satisfied.	○
Curbing global warming	Global	5% improvement in "average energy consumption per unit" (weighted average by business unit) over FY2016-FY2020 compared with FY2011-FY2015	In FY2016 and FY2018, we achieved a 19.8% increase on average over the target of 5%.	○
Preserving biodiversity Effective use of resources by "Reducing" consumption	Global	5% improvement in "average waste generation per unit" (weighted average by business unit) over FY2016-FY2020 compared with FY2011-FY2015	In FY2016 and FY2018, we achieved a 8.6% increase on average over the target of 5%.	○
		5% improvement in "average water use per unit" (weighted average by business unit) over FY2016-FY2020 compared with FY2011-FY2015	In FY2016 and FY2018, we achieved a 20.6% increase on average over the target of 5%.	○
Preserving biodiversity Effective use of resources by "Reuse" and "Recycling"	Global	10% improvement in "average final disposal volume per unit" (weighted average by business unit) over FY2016-FY2020 compared with FY2011-FY2015	In FY2016 and FY2018, we achieved a 35.8% increase on average over the target of 10%.	○
	Japan	Recycle 99.5% of waste or more	In fiscal 2018 alone, we achieved a 99.9% increase over the target 99.5%.	○
Preserving biodiversity Nature conservation in local area	Global	Continue to carry out nature conservation activities in local area (in forests etc.)	We have continuously carried out activities for planting trees and preserving the Taiyo no Mori forest and Taiyoyama Mountain.	○

\* Weighted average: An average in which each quantity to be averaged is assigned a weight.

# Curbing Global Warming

10

There are three categories for greenhouse gases (GHG) emitted during the course of business activities: Direct emissions from use of energy (SCOPE 1), Indirect emissions from energy use (SCOPE 2) and Indirect emissions other than from energy use (SCOPE 3). GHG emissions cannot be easily measured, so we concentrate on energy use and reducing energy consumption.

## Results of Efforts to Reduce Greenhouse Gases and Energy Consumption

In FY2018, the amount of GHG emitted by the entire group decreased by 3,000 t-CO<sub>2</sub>e compared to FY2017. Specifically, the sites in Japan decreased their emissions to 188,000 t-CO<sub>2</sub>e from 194,000 t-CO<sub>2</sub>e in FY2017, while the sites outside Japan increased to 306,000 t-CO<sub>2</sub>e from 303,000 t-CO<sub>2</sub>e in FY2017 (see G1).

The amount of energy used by the entire Group increased by 3,000 kL compared to FY2017. Specifically, the sites in Japan increased their usage to 95,000 kL from 94,000 kL in FY2017, while the sites outside Japan increased to 131,000 kL from 129,000 kL in FY2017 (see G2).

Energy usage is broken down into 92% for SCOPE 2 and 8% for SCOPE 1 (see G3).

Improvement in energy intensity, which we aim to achieve in the medium term environmental target, was 19.8% in FY2016 and FY2018 on average (see G4).

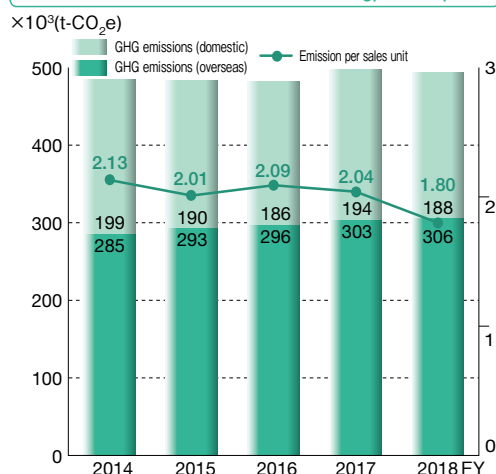
We will continue to review production processes with a focus on core products to further improve the production efficiency and lower energy usage.

Note: Changes in the conversion factor have a major impact on GHG calculations, so the medium environmental targets were set according to energy consumption (crude oil equivalent), a factor that has measureable results.

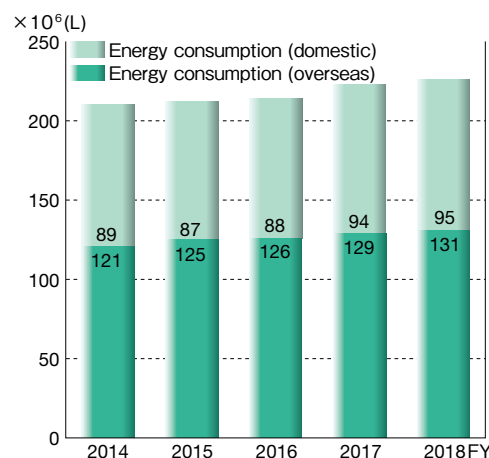
Note: GHG emissions are calculated using GHG Protocol factors (electricity by country).

Note: GHG emissions in Japan have been corrected after reviewing the electricity-CO<sub>2</sub> conversion factor.

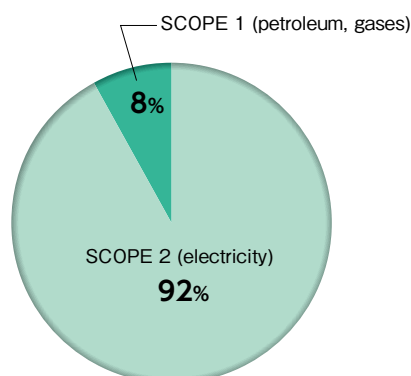
G1: GHG Emissions (calculated from total energy consumption)



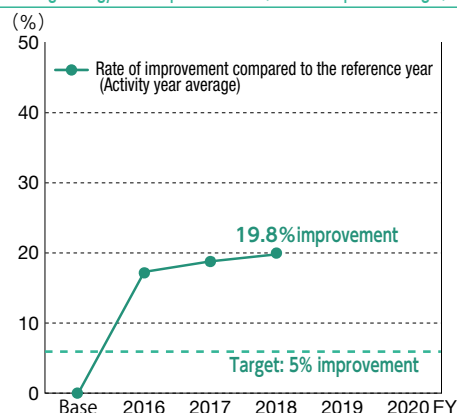
G2: Energy Consumption (crude oil equivalent)



G3: Breakdown of Energy Consumption (crude oil equivalent)



G4: Average Energy Consumption Per Unit (results compared to target)



## Efforts on Indirect Emissions Other than from Energy Use (SCOPE 3)

In recent years, there has been a growing demand from our stakeholders to disclose information on SCOPE 3 emissions, in addition to information on SCOPE 1 and SCOPE 2 emissions. To meet this demand, we are working to obtain a clear picture of our SCOPE 3 emissions. We have ascertained that our GHG emissions from purchased goods and services in FY2018 were 345,000 tons-CO<sub>2</sub>e (group), 7,608 tons-CO<sub>2</sub>e from commutes (domestic sites), 462 tons-CO<sub>2</sub>e from business trips (domestic sites), 5,651 tons-CO<sub>2</sub>e from disposal and processing of waste (domestic sites), and 39,517 tons-CO<sub>2</sub>e from transporting products (group).

# Reducing Waste / Preserving Water Resources 2-1

11

We strive to reduce environmental effect on biodiversity while coexisting with nature, and we use the 3Rs (reduce, reuse, recycle) to reduce waste and make effective use of water resources.

## Results of Reducing Waste

The amount of waste generated in FY2018 by the entire group increased to 23,300 t from 22,600 t in FY2017. This was caused by an increase in production volume and other factors (see G1).

The waste (including valuables) mainly consists of waste plastic, sludge, and waste oil (see G2).

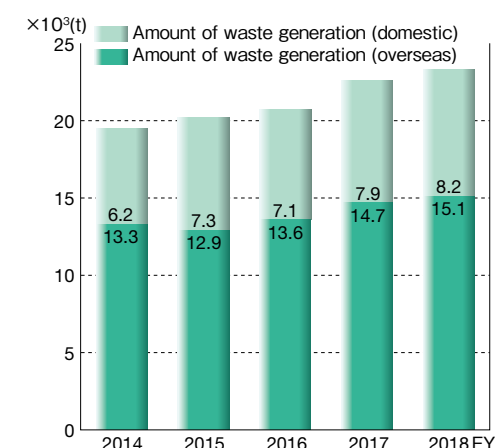
The final amount of waste disposed of in Japan decreased to 3 t from 5 t in FY2017. The waste recycling rate, which we aim to improve in the medium term, was 99.9% (see G3).

The final amount of waste disposed of outside Japan decreased from 1,900 t in FY2017 to 1,800 t (see G4).

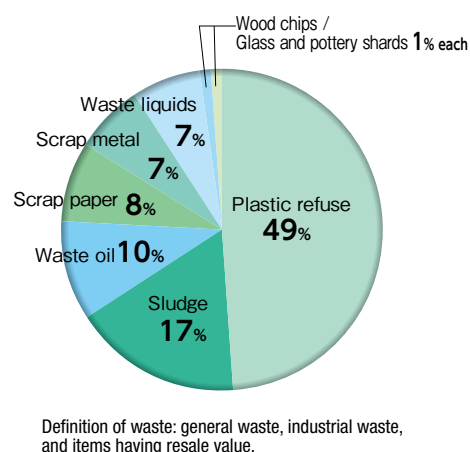
Improvement in waste generation per unit of production, which we aim to achieve in the medium-term environmental target, was 8.6% on average for FY2016–FY2018 (see G5). The final amount of waste disposed of per unit of production was improved by 35.8% on average for FY2016–FY2018 (see G6).

We will continue working to reduce waste volumes, boost in-house recycling rates, and recycle waste into resources at our overseas sites.

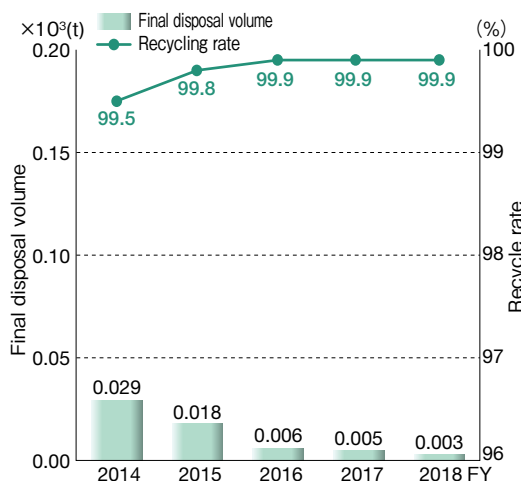
G1: Amount of Waste Generation



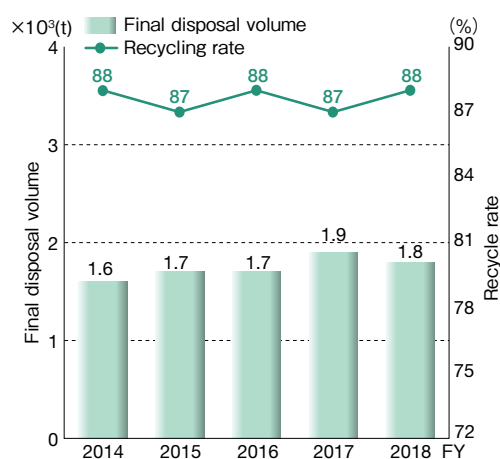
G2: Breakdown of Waste



G3: Domestic Final Disposal Volumes and Recycling Rates



G4: Overseas Final Disposal Volumes and Recycling Rates

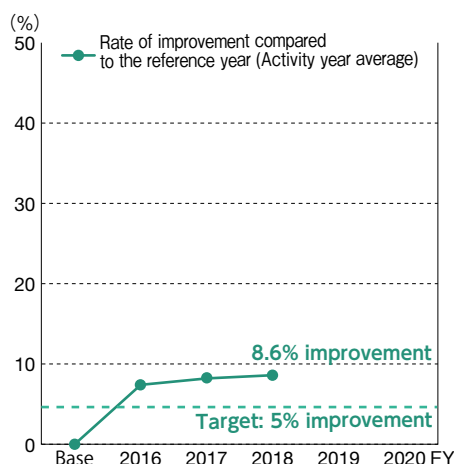


# Reducing Waste / Preserving Water Resources 2-2

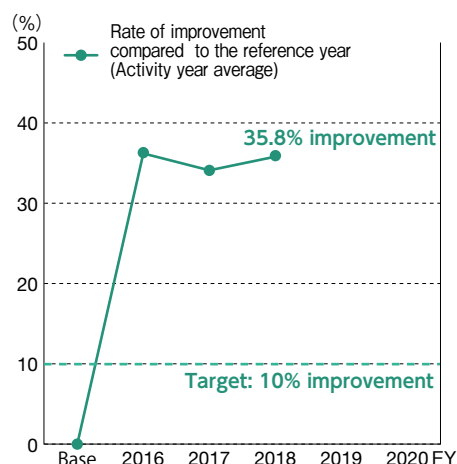
12

## Results of Reducing Waste

G5: Average Waste Generation Per Unit (results compared to target)



G6: Average Final Disposal Volume Per Unit (results compared to target)



## Resource Recycling Efforts

99.9% of the waste generated in the course of our business activities is recycled and reused as resources in society. However, we are also promoting efforts to reuse waste for the business activities of the Taiyo Yuden Group.

For solvent A, which is the most frequently used solvent in our business activities, 13% of the amount used is recycled waste solvent. In addition, for reels that are used for packaging electronic parts, strict quality checks are performed and 14% of all the reels are recycled reels.

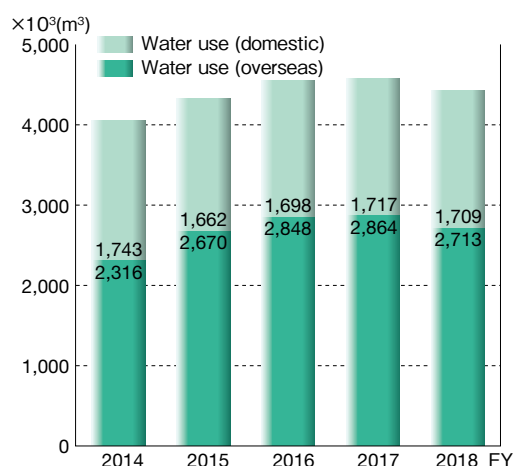
## Results of Water Resource Efforts

The water usage of the entire group decreased from 4,581,000 m<sup>3</sup> in FY2017 to 4,422,000 m<sup>3</sup> in FY2018. Specifically, the sites in Japan decreased their usage to 1,709,000 m<sup>3</sup> from 1,717,000 m<sup>3</sup> in FY2017, while the sites outside Japan also decreased to 2,713,000 m<sup>3</sup> from 2,864,000 m<sup>3</sup> in FY2017 (see G7).

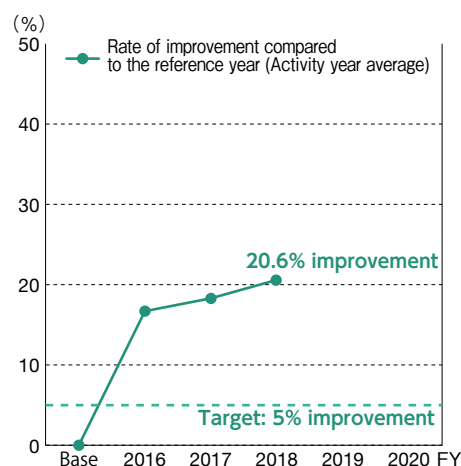
Improvement in water usage per unit of production, which we aim to achieve in the medium-term environmental target, was 20.6% on average for FY2016–FY2018 (see G8).

The amount of recycled water was 1,203,000 m<sup>3</sup>.

G7: Water Use



G8: Average Water Use Per Unit (results compared to target)





## Our Efforts

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### Reducing Greenhouse Gas Emissions

#### Improved compressor operation efficiency

[Tamamura Plant, FUKUSHIMA TAIYO YUDEN CO., LTD., and TAIYO YUDEN (GUANGDONG) CO., LTD.]

We run multiple compressors to supply compressed air to production lines and are making various efforts to increase their operation efficiency. Tamamura Plant began to use compressors that use an inverter to control motor speed. FUKUSHIMA TAIYO YUDEN CO., LTD. and TAIYO YUDEN (GUANGDONG) CO., LTD. reduced the load of compressors by reducing their air discharge pressure. These improvement efforts resulted in optimal compressor operation reducing electricity consumption. The amount of GHG emissions reduced as a result was 833 t-CO<sub>2</sub>e per year.



Compressors to supply compressed air

#### Reduced energy consumption of freezers by improving operation efficiency

[Haruna Plant and KOREA TONG YANG YUJUN CO., LTD.]

Haruna Plant used to operate three freezers alternately, but upon examining their operation status, integrated them into a modular inverter chiller, which reduced energy consumption. KOREA TONG YANG YUJUN CO., LTD. reduced energy consumption of a freezer by updating it to a low-pressure centrifugal chiller with better operation efficiency. The amount of GHG emissions reduced as a result was 400 t-CO<sub>2</sub>e per year.



Modular inverter chiller

#### Reduced energy consumption of air conditioning systems by using a heat shield paint

[TAIYO YUDEN CHEMICAL TECHNOLOGY]

A plant roof has nothing to block direct sunlight. Its surface gets hot making the inside hot too. As a result, air conditioning systems have to be set higher which consumes extra energy. To suppress the increase of the roof temperature, we coated the entire roof with a special heat shield paint. This has lowered the surface temperature by approximately 8°C and reduced the energy used by the air conditioning systems. The amount of GHG emissions reduced as a result was 4 t-CO<sub>2</sub>e per year.



Roof coated with a heat shield paint

### Reducing Water Use

#### Water conservation by recycling wastewater

[TAIYO YUDEN Mobile Technology]

TAIYO YUDEN Mobile Technology has launched a system in which water used for cutting, which used to be discharged, is collected, cleaned by filters, and reused in the production process. This significantly reduced the amount of water used for cutting. The amount of water reduced as a result was approximately 54,000 t per year.



Cutting water recovery system

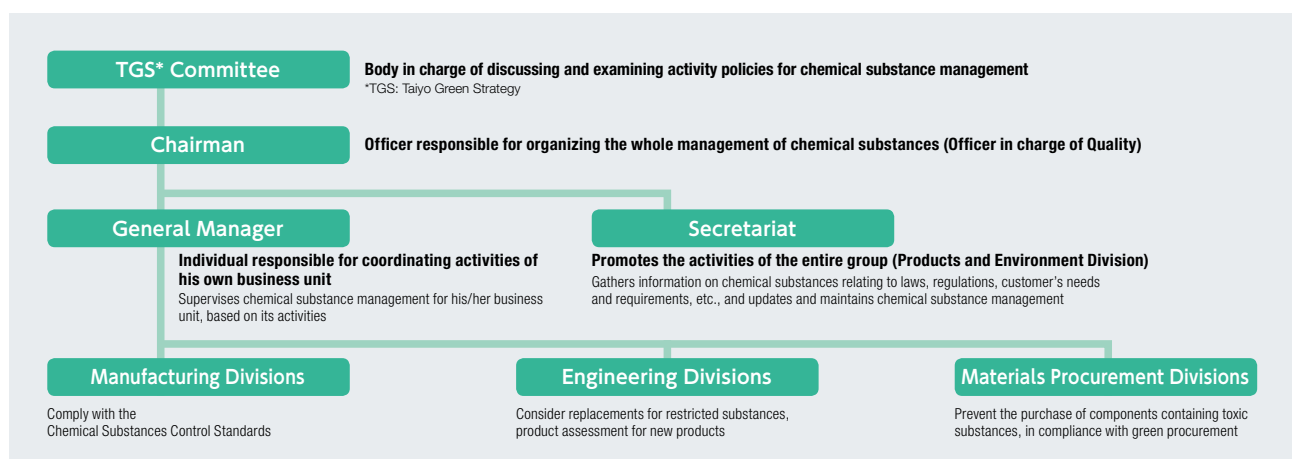
# Appropriate Management of Chemical Substances

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To ward off environment contamination with chemicals and adverse effects on human health, we have banned the use of forbidden substances, implemented a chemical management framework, and are working on reducing emission volumes.

## Chemical Management Framework

The Taiyo Yuden Group has its own standards in place for chemical substance management, which define chemical substances that must not be used, must only be used in limited situations, and must be managed.



### Target Chemicals

Prohibited substances	Cadmium, compounds containing cadmium, mercury, compounds containing mercury, hexavalent chromium compounds, etc.
Substances to be restricted	Lead in ceramic/glass frit and piezoelectric bodies, tetrabromobisphenol A (TBBPA), polycyclic aromatic hydrocarbons (PAHs), and so on.
Substances to be managed	Toluene, REACH SVHC (substance of very high concern), xylene, etc.

## PRTR Law Compliance

In order to reduce the risks that chemicals impose on the environment, the Taiyo Yuden Group reports to the government the amounts of chemicals released to the environment (air, water, and soil), and waste chemicals transported and recycled under the Japanese Law for Pollutant Release and Transfer Register (PRTR). The government publishes the records and a database of these quantities making them widely available to members of the general public.

### PRTR Restricted Substances

Substance Number	Chemical Substance Name	Emission (ton/year)	Amount Transferred (ton/year)	Amount Recycled (ton/year)	Substance Number	Chemical Substance Name	Emission (ton/year)	Amount Transferred (ton/year)	Amount Recycled (ton/year)
71	Ferric chloride	0.0	20.4	0.0	309	Nickel compounds	0.7	5.2	19.4
82	Silver and its water-soluble compounds	0.0	0.2	3.3	374	Hydrogen fluoride and its water-soluble salts	0.0	1.5	0.0
272	Water-soluble copper salt	0.0	0.2	0.1	405	Boron compound	0.3	0.7	0.0
300	Toluene	24.5	3.9	31.5	438	Methylnaphthalene	0.1	0.0	0.0
308	Nickel	0.2	1.4	58.5					

Note: Target chemical substances and their incoming amount shown refer to substances for which their incoming amount exceeds 1 ton in compliance with the PRTR Law.

Emission: This refers to the total emission into the atmosphere, water, and soil.

Amount Transferred: This refers to the amount whose disposal is outsourced to an industrial waste contractor outside the business facility concerned.

## Ozone-depleting Substances

We do not use ozone-depleting substances in our production processes. Although we use HCFC as a coolant in air conditioners and other equipment, we carry out appropriate collection and disposal.

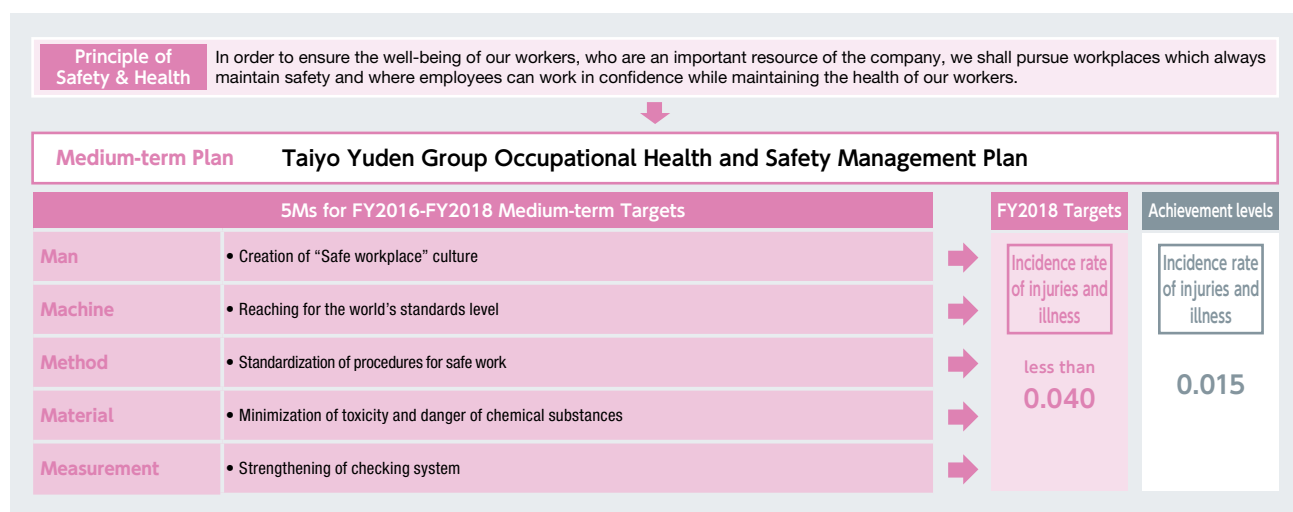
# Achievement Levels for Medium-Term Occupational Health and Safety Targets

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All employees participate in health and safety efforts based on the Fundamental Principle of Health and Safety outlined in the Taiyo Yuden Group Safety and Environment Charter and implemented according to the Occupational Health and Safety Management System (OHSMS).

## Fundamental Principle of Safety & Health and Targets

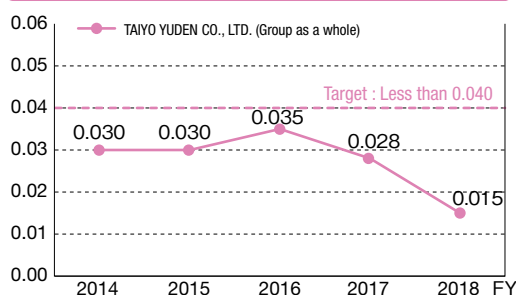
In order to realize our health and safety philosophy of “creating a workplace where employees can work without anxiety,” the Taiyo Yuden Group has drawn up group-wide medium-term plans. The medium-term plan is set to prevent industrial accidents by clarifying action targets for each 5Ms (Man, Machine, Method, Material, Measurement) and by setting a target incidence rate of injuries and illness for numerically evaluating the result of such efforts.



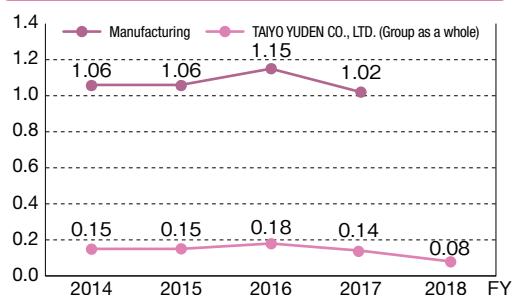
## FY2018 Work-related Accidents and Safety Indicators

In FY2018, the incidence rate of injuries and illness for the entire group was 0.015, which was below the medium-term target of 0.040 (see G1). In FY2018, the accident frequency rate for the entire group was 0.08 (see G2), and the danger ratio was 0.0015.  
Note: No fatal accident has occurred.

G1: Trends in incidence rate of injuries and illness



G2: Trends in Accident Frequency Rate



$$\text{Incidence rate of injuries and illness} = \frac{\left( \text{Number of the absentees due to occupational injury (at least one workday lost)} \right) + \left( \text{Number of the absentees due to occupational illness (at least one workday lost)} \right)}{\text{Total actual number of hours worked by registered workers}} \times 200,000$$

$$\text{Accident Frequency Rate} = \frac{\text{Number of the victims of occupational injury (at least one workday lost)}}{\text{Total actual number of hours worked by registered workers}} \times 1,000,000$$

We are promoting countermeasures against occupational injury and illness by conducting risk assessments in all workplaces. We found no workplace with high risks. Going forward, we will continue to carry out activities geared towards achieving zero work-related accidents from the perspective of the 5Ms, based on our medium-term health and safety plan.

# New Medium-Term Occupational Health and Safety Targets (FY2021 Medium-Term Targets)

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## New Medium-Term Occupational Health and Safety Targets (FY2021 Medium-Term Targets)

FY2018 was the final year of the FY2016–FY2018 medium-term targets. We evaluated, analyzed, and compared our performance for each target, and then established the New Medium-Term Occupational Health and Safety Targets (FY2021 Medium-Term Targets).

To eliminate all “unsafe states and behavior” as the causes of occupational accidents, we have clearly laid out a three-year strategy to further raise the standard of the Health and Safety program for each of the 5Ms (Man, Machine, Method, Material, and Measurement) that we have been working on.

We will implement activities in line with these New Medium-Term Occupational Health and Safety Targets, promote specific efforts to eliminate occupational accidents, reduce serious risks, and create and establish a safety culture.



$$\text{Incidence rate of injuries and illness} = \frac{\left( \frac{\text{Number of the absentees due to occupational injury (at least one workday lost)}}{\text{Total actual number of hours worked by registered workers}} \right) + \left( \frac{\text{Number of the absentees due to occupational illness (at least one workday lost)}}{\text{Total actual number of hours worked by registered workers}} \right)}{1} \times 200,000$$

## Efforts and Status 2-1

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### Man

#### Creation of "Safe workplace" culture

To create a safe workplace culture, we are carrying out activities to help employees increase their knowledge of Health and Safety so they can perform their work with such knowledge in mind. In FY2018, we conducted a Safety Awareness Survey to examine how employees felt about health and safety and whether they were using the skills they have developed or not. We then analyzed the survey results. To address the issues identified in the analysis results, in FY2019, we will develop and implement concrete steps to enhance safety awareness of every single employee. We will continue to administer the Safety Awareness Survey regularly to promote a safe workplace culture.

Safety Awareness Survey questionnaire

### Machine

#### Global standardization of equipment safety activities (ISO and IEC)

With the objective of ensuring our equipment safety activities conforming to global standards (ISO and IEC), we are reviewing the Safety Standards for Group Equipment, which define measures against risks common to production equipment to enhance the safety measures for equipment. In FY2018, we increased the number of qualified Safety Basic Assessors (SBAs) (90 individuals) for the purpose of enhancing equipment safety skills of equipment development designers and those who modify equipment in Japan. Also, due to the revision of the international standard, we reviewed and revised the current Safety Standards for Group Equipment checklist after collecting feedback from checklist users such as equipment development designers and equipment checkers. We will continue our efforts to reduce industrial accidents associated with equipment.



Training of qualified Safety Basic Assessors (SBAs)

### Method

#### Standardization of procedures for safe work

We are upgrading and reviewing procedures to standardize them and make them safe and consistent so that employees can work more safely. In FY2018, we began the RBA-VAP audit at group sites in Japan. To address issues detected in the audit that refer to other sites, we standardized and implemented detailed management methods that would satisfy the audit requirements, and as a result, raised the level of site management. We will continue to work towards promoting a safe working environment from a common perspective.

RBA-VAP audit list

### Material

#### Minimization of the harmfulness and danger of chemical substances

To minimize the hazards and dangers of chemical substances, we are continuously taking measures against risks associated with tasks that require workers to handle chemical substances. Chemicals-related rules have been standardized under the Occupational Health and Safety Management System for the corporate group in Japan. In FY2018, these rules were subdivided by chemical substance category based on the risk level and legal and other requirements. Then, compliance requirements for these subdivided rules were defined. Standardization of the rules in even more detail has reduced risks caused by chemical substance handling. We will continue to work towards minimizing the hazards and dangers of chemical substances.

Organic solvent management rules

### Measurement

#### Enhancement of check levels

To provide safe and hygienic workplaces, we are working to raise check levels by upgrading and improving the methods for identifying invisible hazards (or those that have gone unnoticed). In the Taiyo Yuden Group, patrolling is performed from various perspectives by employees who specialize in health and safety and the zone managers of each workplace. In FY2018, we interviewed each employee who suffered an occupational injury to learn from their perspective how the incident occurred, what the workplace environment was like, and what their psychological state was. Through the interview we identified potential causes and incorporated them into our countermeasure development. We will continue to raise the check levels to provide safe and hygienic workplaces.



## Efforts and Status 2-2

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### Health

#### ① Maintaining low incidence ratio for mental health problems

It has been over 10 years since the group introduced a mental healthcare program. During this period, our mental healthcare system has advanced through support activities such as counseling, line care training, support for leaves of absence and returning to work, and stress checks using an online system.

To care for the staff, we have established a system that allows the industrial health staff (including counselors, public health nurses, and nurses) to provide added care so that they can identify employees who are not feeling well earlier and provide them with the appropriate support.

We conduct the stress checks required by law for workplace analysis and improvement.

In workplace analysis, we worked with psychiatrists, industrial physicians, and clinical psychologists to host lectures for industrial health staff where they learned how to analyze stress check results from industrial physicians.

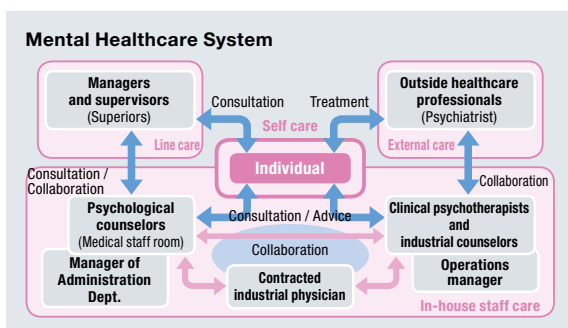
In workplace improvement, we used the workplace analysis results to identify workplaces with a high incidence of mental health problems. Clinical psychologists provided self-care training at these workplaces.

The rate of employees who suffered mental illness went up from FY2015 but remained the same between FY2017 and FY2018. It is however still increasing among young employees, and we will therefore address this issue by effectively providing counseling to detect problems early.

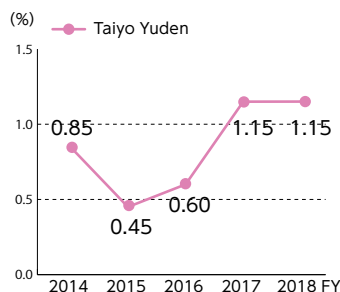
We will continue to work on providing mental health care so that all employees can work with a healthy body and mind.



Study meeting of the industrial healthcare staff



G1 : Incidence Ratio



#### ② Maintaining the rate of diagnosis in periodic medical checkups

In the Taiyo Yuden Group, industrial physicians, nurses, and public health nurses provide health guidance to help each employee improve their ability to care for their own health. So far, we have provided three types of guidance: (1) exercise guidance, (2) health guidance, and (3) nutritional guidance. As a result, the rate of employees who were diagnosed with an illness in FY2018 was 52.6% while the national average was 54.1%. To decrease or at least maintain this rate, in FY2018, we began preparing healthy company management activities to promote employee health, improve corporate performance, and enhance corporate social value.

To prevent the employee illness rate from rising, we held a health awareness seminar for smokers in which they gained correct knowledge about cigarettes, learned about limiting of smoking areas, and measured their breath CO levels.

We will continue to promote healthcare activities so that our employees can work comfortably and in good health.



Health awareness seminar for smokers