Environment

Taikisha is working to realize a low carbon society by reducing greenhouse gas (GHG) emissions and environmentally hazardous substances by leveraging its technological expertise cultivated in the HVAC business.

Environmental Management

Taikisha continuously operates the environmental management system to raise awareness of the environment and reduce environmental risks.

Environmental Management Vision

Taikisha strives to improve environmental value for its clients and to protect the global environment using Taikisha's solution technologies as a company engaged in business related to the environment.

1. Improving Environmental Management

Actively engage in finding solutions for social issues related to the global environment by accurately understanding social trends changing day by day.

Continuously apply environmental management system and reduce environmental risks.

Actively disclose environmental information to the public while improving environmental education and awareness in its offices.

2. Promoting Environmental Business

Promote energy management in life cycles and reduce CO_2 emissions during the operation of systems Taikisha supplies.

Develop technologies for exhaust gas and effluent treatment and contribute to the prevention of environmental pollution.

Promote R&D of new eco-friendly technologies and products.

3. Developing Environmental Conservation Activities

Check and minimize energy consumption in its offices and laboratories.

Implement thorough measures regarding the surroundings, construction by-products and harmful materials at its workplaces.

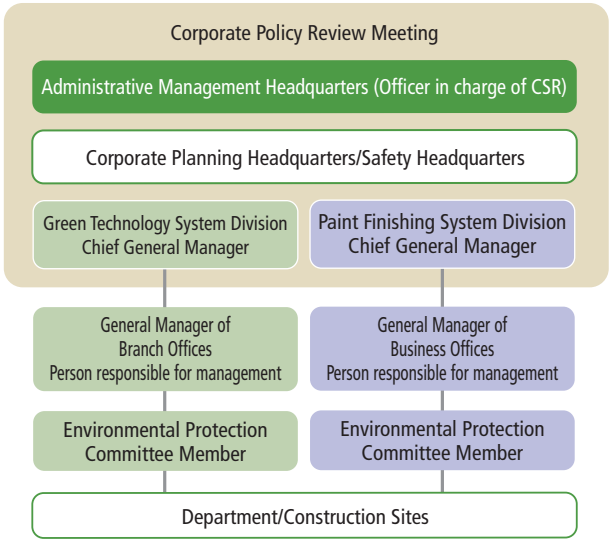
Promote green procurement.

Operation and Promotion System

At Taikisha, the officer in charge of CSR takes the initiative to draw up company-wide action plans, check and assess the status of efforts, and review goals, with the purpose of promoting its efforts for environmental protection based on the "Environmental Management Vision." Taikisha will strive to raise its environmental protection activity level by continuously making improvements through the operation of the environmental management system.

Taikisha distributes its environmental policy to its business partners in accordance with the ISO14001 standard and requests their full cooperation in observing the policy.

● Environmental Management System Operation and Promotion System Chart



Environmental Management Activities

Taikisha has set out the Business Division Environmental Policy and Branch Office Environmental Policy, based on the Company-wide Environmental Management Vision and Environmental Management Master Plan. Taikisha also evaluates the environmental impact in business processes and creates an environmental impact evaluation sheet. Each department breaks them down into a development plan, design policy plan, and project policy plan for each project and development theme, and promotes day-to-day environmental management activities.

The effectiveness of environmental management policies and activities are confirmed at the Corporate Policy Review Meeting, Domestic Business Office General Manager Meeting, Branch Office Management Review Meeting, Development Review Meeting, Design Examination Meeting and Construction Review Meeting, in order to confirm the status of environmental management activities.

Development of the Environmental Management Activities

Corporate-wide (Corporate Policy Review Meeting)

Environmental Management Vision	Environmental Management Master Plan

▼

Business Division (Domestic Business Office General Manager Meeting)

Business Division Environmental Policy

▼

Branch Office (Branch Office Management Review)

Branch Office Environmental Policy

▼

Department (Development Review Meeting/ Design Examination Meeting/Construction Review Meeting)

Development: Development Plan	Design: Design Policy Plan	Construction: Project Policy Plan

Compliance with Laws and Regulations and Responses to Complaints Regarding Environmental Issues

Taikisha stores information in an internal database about revisions to environment-related laws and regulations that need to be taken into account in conducting business operations and information on ordinances of prefectures and designated cities to disseminate the information to all employees.

In addition, Taikisha puts information on laws and regulations relevant to each business process in the Quality Assurance System Diagram to further ensure compliance with such laws and regulations. Taikisha records complaints regarding environmental issues that came up in Taikisha, including information on causes of complaints, remedial measures and preventive measures, in the internal database to share information within the group.

There was no major complaint regarding environmental issues that occurred in FY2019.

Taikisha conducts employee education in all business offices to prevent the recurrence of complaints that occurred in the past, and provides guidance and education through on-site patrols and other measures.

Status of Acquisition of ISO Certification

The Green Technology System Division and the Paint Finishing System Division integrated quality and environmental management systems and were certified with ISO Standards 2015.

Taikisha Group's Status of Acquisition of ISO Certification

Country name	Company name	ISO 9001	ISO 14001
Japan	Taikisha Ltd.	●	●
China	Wuzhou Taikisha Engineering Co.,Ltd.	●	●
Taiwan	Taikisha (Taiwan) Ltd.	●	
Thailand	Taikisha (Thailand) Co.,Ltd.	●	●
Vietnam	Taikisha Vietnam Engineering Inc.	●	●
Philippines	Taikisha Philippines Inc.	●	
Singapore	Taikisha (Singapore) Pte. Ltd.	●	●
Malaysia	Taikisha Engineering (M) Sdn. Bhd.	●	
Indonesia	P.T. Taikisha Indonesia Engineering	●	
India	Taikisha Engineering India Pvt. Ltd.	●	●
USA	TKS Industrial Company	●	●
Italy	Geico S.p.A.	●	●

The certification acquisition rates at business offices in Japan are 100% in both business divisions.

Environmental Accounting

Taikisha calculates the cost and economic effects of environmental protection based on the basic concept of the Environmental Accounting Guidelines issued by the Ministry of the Environment.

Environmental protection cost	Amount of cost	Main activities
The cost within the business area	309 million yen	Waste disposal cost, introduction of eco-friendly cars
Management activities cost	8 million yen	In-house environmental management system operation cost, environmental education
Research and development cost	446 million yen	Research and development cost for eco-friendly products and services
Social activity cost	1 million yen	Donation to environment conservation groups
Total	764 million yen	

Economic effects of environmental protection measures	Amount of cost	Main activities
Revenue amount	7 million yen	Proceeds from the sales of valuables through waste recycling
Cost reduction	6 million yen	Cost reduction effect of introduction of eco-friendly cars
Total	13 million yen	

Environmental Education (for New Employees)

Taikisha provides introductory education on the Vision and System of Environmental Management and education on the environmental management operations of each department, to new employees every year. They also attend skill training courses for senior operations engineers relative to asbestos, organic solvent work, and hazardous work in oxygen-deficient air or work involving hydrogen sulfide, and obtain certifications. This system ensures that new employees learn the necessary knowledge to handle chemical substances and hazardous substances from their first year.

[Taikisha Group] Efforts for Realizing a Low Carbon Society

Taikisha is working on reducing GHG emissions in the entire supply chain.

Risks and Opportunities of Climate Change

The United Nations adopted the Sustainable Development Goals (SDGs), a set of 17 global goals to be attained by 2030. These SDGs, based on the recognition that climate change is threatening the sustainability of the earth's life support system, strongly urge organizations to take urgent measures to reduce the impact of climate change. Against such a backdrop, the Paris Agreement governing climate change reduction measures from 2020, adopted at the United Nations Framework Convention on Climate Change (COP21), has come into effect. To realize the aim of the Paris Agreement, which is to limit the rise in global average temperature, it is important to take measures toward realizing low-carbon emissions to reduce greenhouse gas (GHG) emissions and, furthermore, zero-carbon emissions.

Taikisha recognizes that the potential disturbance of the continuity of business by typhoons, heavy rain and other natural disasters as well as business development being affected by the tightening of environmental regulations are climate change risks. On the other hand, Taikisha expects that climate change could expand customer needs for environmental measures and create opportunities for many clients to utilize Taikisha's environmental technologies. By capturing such opportunities accurately, Taikisha will promote "zero-carbon emissions" through its business operations.

Energy- and Resource-Saving Achievements

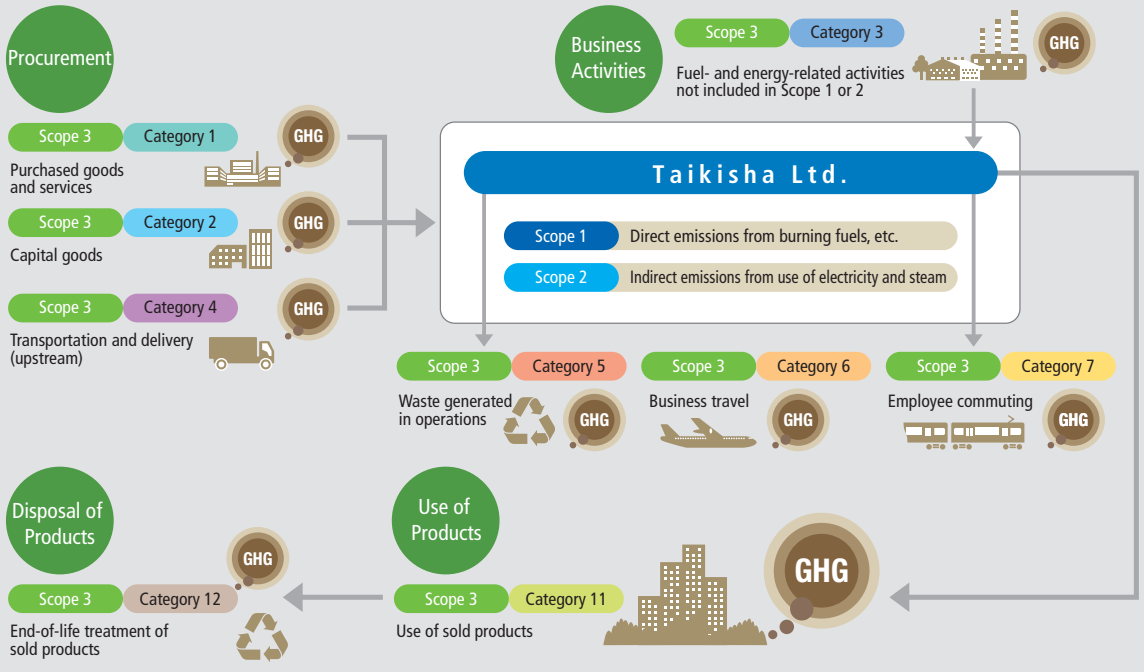
Taikisha's power usage in all offices (Japanese offices) in FY2019 was 147 kWh/m^2. Taikisha will continue to conduct energy-saving and consumption-reduction activities by raising the awareness of each employee to ensure the implementation of energy-saving measures, such as observing Cool Biz and setting air conditioners at energy-efficient temperatures.

Grasping the Level of Scope 1 and 2 Emissions to Reduce CO_2 Emissions

Companies are being required to reduce GHG emissions through business operations at construction sites and offices to help curb global warming.

Looking at Taikisha's GHG emissions in FY2019, Scope 1 emissions, which are direct emissions from combustion of fuels, etc., were 1,356 t-CO_2, and Scope 2 emissions, which are indirect emissions from use of electricity, etc., were 1,329 t-CO_2. Taikisha will continue to work on saving energy at construction sites and offices.

● Conceptual Diagram of GHG Emissions Control in the Entire Supply Chain



Breakdown of Scope 3 Emissions

Looking at Taikisha's GHG emissions in the supply chain for FY2019, Scope 3 emissions were 3,827,369 t-CO_2, of which emissions from Category 11 (use of sold products) accounted for the largest portion at 93.2%. Considering that GHG emissions from the operation phase of the facilities Taikisha provides are largest across its supply chain, Taikisha will make greater efforts than ever to provide facilities and systems with high energy-saving capabilities.

In addition, Taikisha will further promote green procurement by cooperating with suppliers and continue to reduce construction by-products and to appropriately dispose of industrial waste, aiming to curb GHG emissions from production, transportation, and disposal of materials and to help conserve the global environment.

Initiatives in the Green Technology System Business

To promote a low carbon society, the Green Technology System Business is focused on making energy-saving proposals at the operation phase of clients' air-conditioning and sanitary facilities.

Taikisha is engaged in the design and construction of air-conditioning and sanitary facilities for clients in broad areas, such as factories, office buildings and hospitals in Japan and overseas. The volumes of CO_2 emissions from the operation of those facilities over many years significantly exceed the CO_2 emissions from the construction of buildings. The Green Technology System Division proposes systems that reduce energy consumption throughout the life cycle of buildings and offer superior technologies to reduce carbon emissions and environmental impact.

Please see the pages below for details.

- Eco-friendly design and energy-saving proposal activities P.45
- Development of energy-saving technologies P.47

Initiatives in the Paint Finishing System Business

The Paint Finishing System Business is engaged in the design and construction of large-scale paint finishing plants of automobile and aircraft makers in Japan and overseas. Reducing CO_2 emissions in the paint process at these plants has become an important issue in the automobile and aircraft industries. Through providing solutions for this issue, Taikisha contributes to clients' low carbon operation.

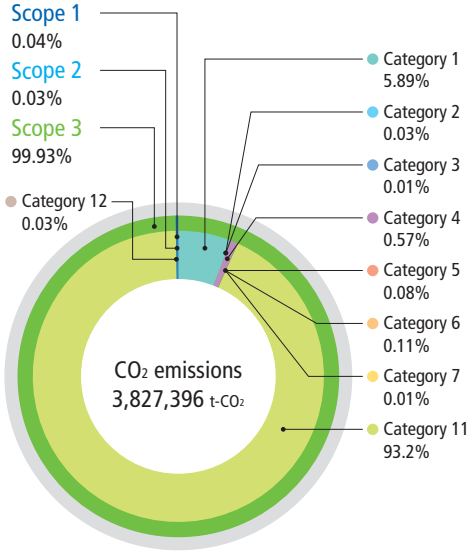
Taikisha strives to promote the energy efficiency and downsizing of facilities by using an energy calculation model for paint finishing lines and setting medium-term reduction targets. Taikisha also makes proposals to reduce CO_2 emissions by introducing renewable energy and a system to recover waste heat from lower temperature sources.

Please see the pages below for details.

- Activities to reduce CO_2 emissions from the paint finishing process
- Achievement of third medium-term target in 2020 and formulation of new medium-term plan going forward

P.46

Breakdown of Scope/Category



*Emission factor is calculated based on the Emission Factor Database on Accounting for Greenhouse Gas Emissions throughout the Supply Chain (ver. 3.0) of the Ministry of the Environment and the Ministry of Economy, Trade and Industry in Japan

Scope/Category		Accounting methods*	Emission amount (t-CO_2)
Scope 1		–	1,356
Scope 2		–	1,329
Scope 3			3,823,237
Category 1	Purchased goods and services	Calculated from (raw) materials procurement amount (in value terms)	225,200
Category 2	Capital goods	Calculated from amount of capital investment	1,295
Category 3	Fuel- and energy-related activities not included in Scope 1 or 2	Calculated from purchased amount of electricity and fuels	385
Category 4	Transportation and delivery (upstream)	Calculated from transportation costs accompanying procurement of (raw) materials	21,720
Category 5	Waste generated in operations	Calculated from amount of waste discharged by type	1,689
Category 6	Business travel	Calculated from travel expenses paid by mode of transportation	4,292
Category 7	Employee commuting	Calculated from transportation expenses paid to employees	390
Category 8	Leased assets (upstream)	Included in Scope 1 and 2 emission calculation	–
Category 9	Transportation and delivery (downstream)	No relevant activities	–
Category 10	Processing of sold products	There are some products that are relevant, but calculations are ignored because their ratios in sales are extremely small.	–
Category 11	Use of sold products	Calculated from emissions from operation of facilities Taikisha provided, HFC leakage from equipment Taikisha provided, and estimated useful lives	3,567,200
Category 12	End-of-life treatment of sold products	Calculated from weight of main equipment by type	1,066
Category 13	Leased assets (downstream)	No relevant activities	–
Category 14	Franchises	No relevant activities	–
Category 15	Investments	Calculations are ignored because the validity of the category 15 estimates is low as a result of many portfolio companies not disclosing Scope 1 and 2 emissions and the impact of the category 15 estimates on the entire supply chain is small.	–
Total of Scope 1, 2 and 3			3,825,922

[Green Technology System Division]

Efforts for Realizing a Low Carbon Society

Taikisha is helping to reduce GHG emissions at the operation phase of the air-conditioning and sanitary facilities it provides to clients.

Activities in the Field of Air-Conditioning System for Buildings and Factories

Eco-Friendly Design

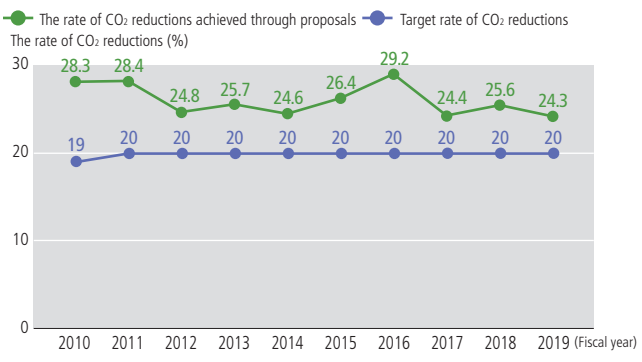
The Green Technology System Business, as part of promoting ecofriendly designs, makes proposals for improving the energy efficiency (reducing environmental impacts) of facilities owned by clients. In energy-saving proposal activities, the Division repeats the cycle of energy-saving diagnosis to grasp the current status, make detailed proposals based on clients' future visions, design and construction, and verify the effects in the operation phase.

To contribute to the target reduction in energy originated CO_2 emissions by FY2030 (25.0% reduction compared with FY2013) under the Plan for Global Warming Countermeasures, a Cabinet decision made in May 2016, Taikisha has developed a proprietary simulation-based Energy Plant Optimal Control System, which maximizes the amount of energy saved by heat source systems through optimal operation control according to external conditions that change from hour to hour and thus helps reduce CO_2 emissions and running costs.

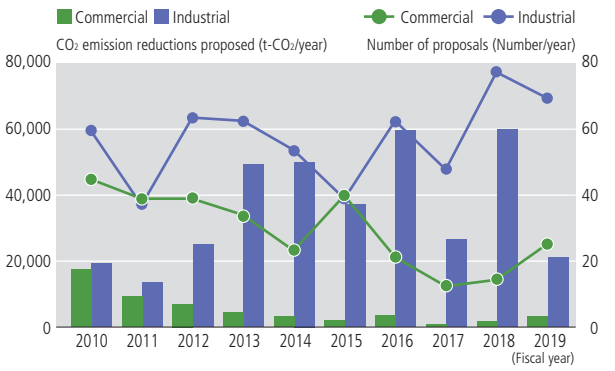
Taikisha is also working on the development of energy-saving technologies of clean room systems that control the circulating air volume by tracking the operation status of production equipment, staffing and indoor environment as well as room pressure control systems, by incorporating the technological progress of AI and IoT in air-conditioning systems to adapt to smart plants and buildings.

Taikisha defines the rate of CO_2 emissions reduced from facilities owned by clients due to Taikisha's proposals as the rate of CO_2 reductions. The transition in the rate of CO_2 reductions for the past 10 years is shown in Figure 1. In FY2019, Taikisha conducted activities by setting a target for the rate of CO_2 reductions of a weighted average of 20% or higher in in-house design projects, and Taikisha exceeded the target at 24.3%. The number of proposals and the proposed amount of CO_2 emission reductions are classified by commercial client (for offices and hospitals, etc.) and industrial client (plants, etc.) and their transitions are shown in Figure 2. The amount of proposed CO_2 emission reductions that corresponds to Category 11 under Scope 3 was about 370,000 t-CO_2 (the effect of 15 years of operation).

● (Figure 1) Transition in the rate of CO_2 reductions through Taikisha's proposals



● (Figure 2) Transition in CO_2 emission reductions proposed and number of proposals



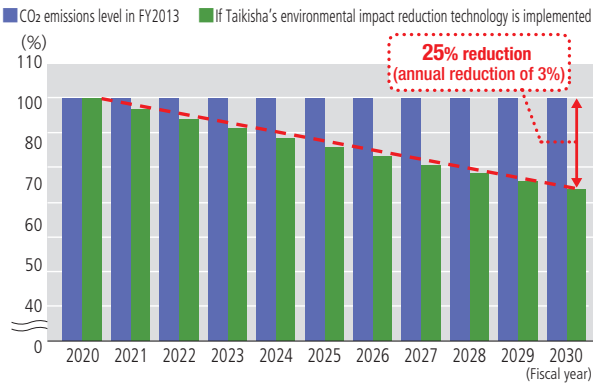
Formulation of New Medium-Term Plan for 2020 and Beyond

As its new medium-term plan's target for 2020 and subsequent years, Taikisha will reduce its CO_2 emission factor in designing and construction by 25% by 2030 relative to the 2013 emissions level.

In order to achieve this target under the medium-term plan, Taikisha will aim to reduce its CO_2 emission factor by 10% in proposals for new construction/full renovation of facilities and by 25% in proposals for partial renovation of facilities for in-house design projects by utilizing energy-saving technologies in its current portfolio.

Furthermore, Taikisha will seek to achieve the FY2030 target by utilizing energy-saving technologies such as production device tracking control currently under development.

● Roadmap for reduction of CO_2 emissions (illustration)



[Paint Finishing System Division]

Efforts for Realizing a Low Carbon Society

Taikisha is helping to reduce GHG emissions in the paint finishing process for automobiles, etc.

Activities in the Field of Automobile Paint Finishing Systems

Activities to Reduce CO_2 Emissions from the Paint Finishing Process

In order to help reduce the environmental impact of the paint finishing process, in which energy usage is particularly high in the automobile manufacturing process, the Paint Finishing System Business has proposed plans to reduce CO_2 emissions from paint facilities in the automobile manufacturing process.

Since 2000, Taikisha has been examining proposals in each fiscal year to meet the medium-term target of 70 kg-CO_2/unit in 2020 by calculating the reduction in CO_2 emissions using the energy estimation model for automobile paint finishing lines.

CO_2 emissions, which were 160.1 kg-CO_2/unit in 2005, decreased to 100 kg-CO_2/unit, which is the first medium-term target, by 2012. By 2015, Taikisha reduced CO_2 emissions further to 80 kg-CO_2/unit, which is the second medium-term target, by promoting facility technologies such as dry filtration booths (dry booths that use pre-coating materials).

Currently, Taikisha is looking into technological proposals aimed at fulfilling the final medium-term target, i.e., the third final target of 70 kg-CO_2/unit to be achieved by 2020. In FY2019, Taikisha achieved 72.2 kg-CO_2/unit based on proposals of such technologies as the new dry scrubber (a dry booth using a cardboard filter).

Achievement of Third Medium-Term Target in 2020 and Formulation of New Medium-Term Plan Going Forward

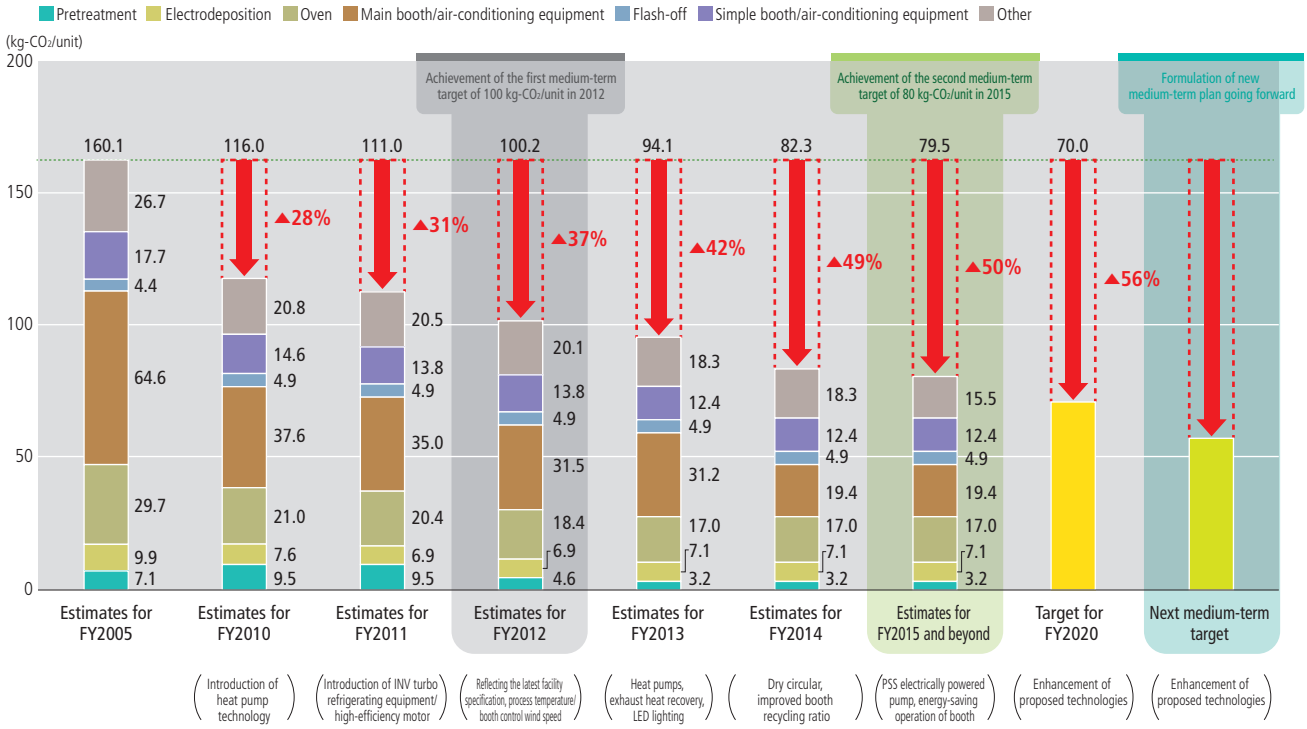
Taikisha is examining technologies to reduce CO_2 emissions with an eye on achieving the target of 70 kg-CO_2/unit in 2020, which is the final fiscal year for the medium-term plan proposed continually since 2010.

For the current fiscal year, Taikisha will also set a new medium-term CO_2 reduction target for automobile painting processes in view of long-term low-carbon targets of automakers who form our clientele, considering the current status of greenhouse gas emissions and the latest environmental technologies, following the achievement of such medium-term target for 2020.

Specifically, Taikisha will promote the introduction of renewable energy (solar thermal energy, etc.), consider waste heat recovery from lower temperature sources, and technology development such as downsizing paint finishing systems and enabling lower baking temperatures in drying ovens. Taikisha will consider adopting next-generation energy sources including hydrogen by 2020.

Taikisha aims to help protect the global environment by implementing these technology proposals for paint finishing systems in cooperation with automobile manufacturers and other related companies.

● CO_2 emissions estimates at automobile paint finishing plants: Transition in CO_2 emission reductions proposed and future target



[Exhaust Air Processing Technologies]

Environmental Impact Reduction Technologies

Taikisha is striving to reduce environmental impacts by utilizing its technologies cultivated over the years.

Environmental Impact Reduction through Exhaust Gas Treatment Technology

Volatile Organic Compounds (VOC), used in automobile painting and various other fields, are the main causative agent of photochemical smog, etc., and reducing these VOC emissions has become a major social concern in recent years.

Taikisha has been undertaking the development of high-heat recovery efficiency, direct fired regenerative thermal oxidizers (RTO) with superior energy-saving properties over the years based on its VOC-reduction technologies developed in the automobile paint finishing system business field. The equipment performs oxidative decomposition at a high temperature, allowing most VOC to decompose, and achieves a high thermal recovery rate of 95% or higher. Another feature of the equipment is that it can perform self-sustained combustion operation, whereby high temperature conditions can be sustained only with combustion heat of a solvent if the level of VOC is high.

Taikisha has a track record of selling more than 380 units of dual-tower RTO and more than 80 units of rotary-type RTO and offers wide-ranging product lines.

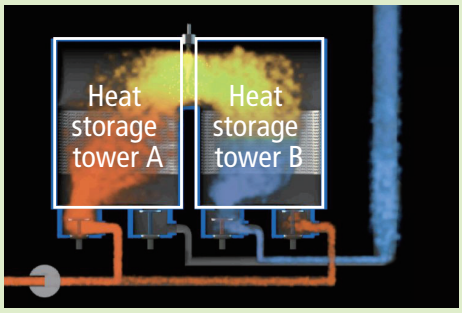
● Product line of RTO

Dual-Tower RTO

Dual-Tower RTO offers a high heat recovery rate during operation of 95% or higher with minimum energy usage.

- VOC treatment efficiency of 98% or higher
- Space-saving/cost-saving

Heat storage alternates with heat release repeatedly in the two heat storage towers and efficiently performs oxidative decomposition of VOC.



Rotary-type

Introduction of rotary valves eliminated emissions of untreated exhaust gas and bad odors and further improved the VOC treatment efficiency.

- VOC treatment efficiency of 99% or higher
- Reduction in pressure fluctuation of exhaust air duct

Untreated gas will be introduced from the opening of the rotary valve to the combustion chamber and decomposed completely.

Triple-Tower RTO helps reduce environmental impact in China

In recent years, environmental regulations have been tightened at a dramatic pace in China, in line with the rapid heightening of environmental awareness. Crackdowns by the environmental protection department of the Chinese government and environment-related organizations of local governments are intensifying.

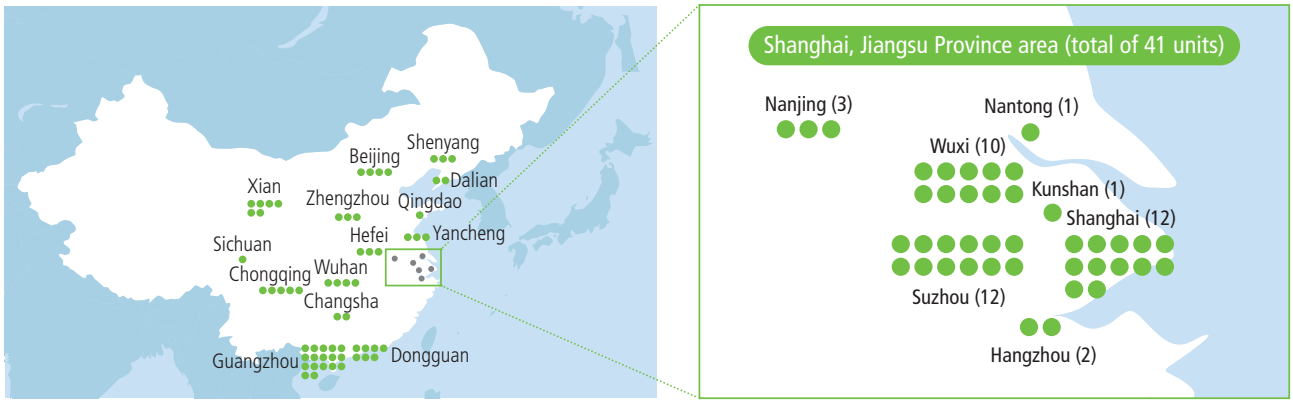
In some regions in China, the emission standards related to air pollution include a limit of total emission volume under constant monitoring. There are more than a few cases where environmental standards stricter than Japan's are adopted.

Under such circumstances, Taikisha's triple-tower RTO (direct fired regenerative thermal oxidizer) has been appreciated for its high VOC removal efficiency and energy-saving properties, and it has been increasingly adopted mainly by Japanese companies.

Compared to a dual-tower RTO, a triple-tower RTO is capable of returning the untreated gas to the RTO by allocating one of the three towers to serve as a purge section, preventing gas from being released directly into the atmosphere and enabling a VOC treatment efficiency of 99% or higher.

To address some clients' request for treatment of a high airflow gas with a low concentration of VOCs, Taikisha also proposes a solution in the form of a system with a two-stage VOC concentrator installed as a prior step to the triple-tower RTO to absorb such a gas to convert it to a low airflow gas with a high VOC concentration before treatment of the gas with the triple-tower RTO. This system

● Track record of construction in China



enables overall VOC treatment efficiency of 99% or higher, while at the same time saving energy for operating the RTO. For that reason, an increasing number of units of this system have also been adopted in China.

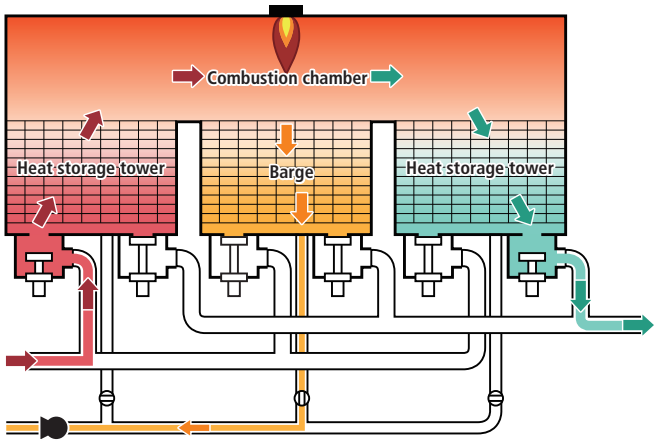
Taikisha sold more than 100 units of VOC exhaust-gas treatment systems throughout China. In addition, Taikisha's local production and procurement structure is now in place in China, which enables us to offer quality products comparable to those of Japan at competitive prices in China.

Having enhanced its maintenance structure following the increase in units sold, Taikisha is now capable of responding quickly to maintenance demand.

Going forward, Taikisha will strive to further contribute to reducing the environmental impact in China through ceaseless efforts such as offering information and guidance on China's environmental regulations for many companies including Japanese companies, as well as enhancing the promotion of its counter-air-pollution technologies for environmental organizations in China.

Also in the future, Taikisha will proactively expand its business to Southeast Asia and India as well as in China.

● Triple-Tower RTO Flow Chart

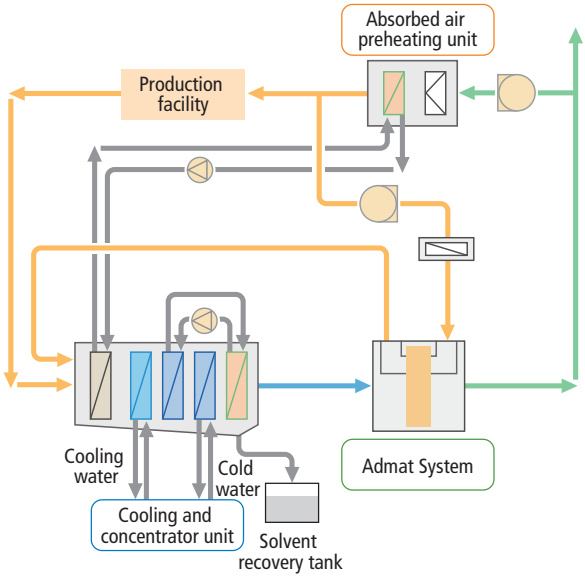


Reduction of Environmental Impact by Utilizing Our Solvent Recovery Technology

Rapid dissemination and increasing adoptions of eco-friendly cars such as electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) are seen nowadays, especially in China, Europe and the United States. As a major energy source of EVs and PHEVs, lithium-ion secondary batteries are the most common. For the production of lithium-ion secondary batteries, N-Methyl-2-Pyrrolidone (NMP) is the essential solvent. From the manufacturing process of these batteries, high volumes of gases containing NMP are emitted.

Taikisha possesses ample experience in its NMP Recovery System to recover NMP from gases containing NMP, and this system has been adopted by many battery makers.

● Taikisha's NMP Recovery System



Recycling-Oriented Society

Taikisha disposes of waste appropriately for effective use of limited resources.

Industrial Waste Disposal and Recycling

At construction sites where Taikisha performs work as the main contractor, Taikisha promotes 4R* activities that involve separating and collecting recyclable industrial waste and curbing the amount of mixed waste generated, in order to reduce the amount of industrial waste generated from such sites that ends up in landfills at final disposal sites.

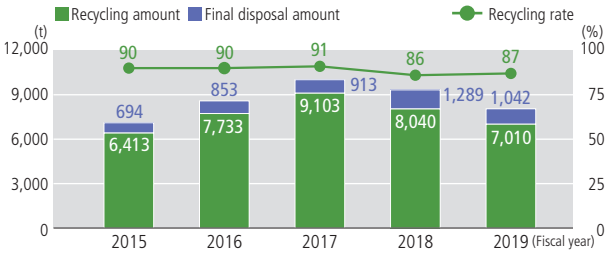
Industrial waste generated is classified into: recycling amount of recyclable resources; and final disposal amount that ends up in landfills. The recycling rate represents the ratio of recycled resources.

*4R=Refuse (eliminating waste in resource use); Reduce (reducing waste); Reuse (reusing waste); Recycle (recycling waste)

Main efforts for recycling

Recycling of work uniforms	Recycling of heat shield materials
Recycling of helmets	Recycling of specified equipment

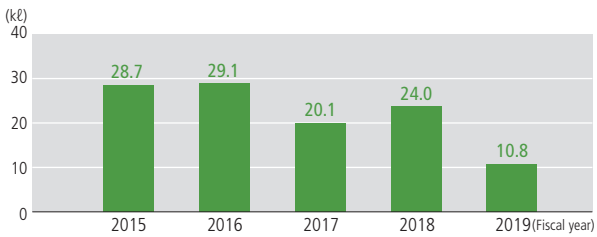
Industrial waste generated and recycling rate



Collection and Management of Hazardous Substances

Taikisha manages the status of collection and proper disposal of hazardous substances (lithium bromide, etc.) generated during renovation work or other projects by creating Hazardous Substances Collection Control Sheets after confirming the existence of such substances based on the Design Policy Plan and Site Environment Control Plan in the design and construction planning stages.

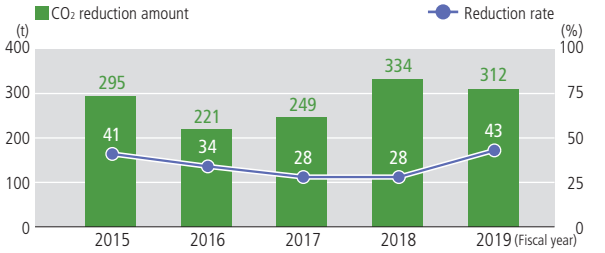
Amount of hazardous substances collected (collection rate: 100%)



Reduction of Waste Generation

Taikisha draws up a plan for reducing waste generation in the Site Environment Control Plan created at construction sites and incorporates such plan into construction plans and drawings. In performing construction works, implemented measures and the reduced amount of waste are calculated, and good improvement cases are updated on the internal document database and shared across the company. Taikisha is reducing CO_2 production by making efforts for preventing waste generation and planning and implementing construction methods and measures, enabling reduction of waste generation.

The amount and rate of CO_2 reduction achieved by curbing waste generation



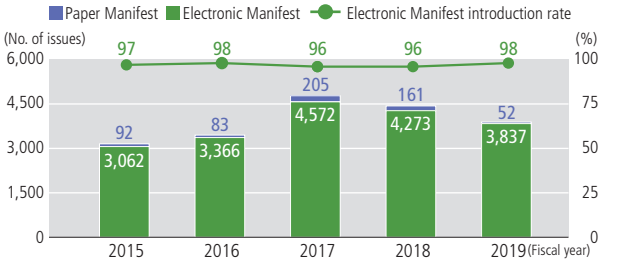
Proper Waste Management

All works in which the main contractor is Taikisha are listed and the waste disposal status is monitored to ensure the waste is treated properly.

Also, local government permit information on all industrial waste disposal agencies with which Taikisha has contracts is collected, listed, and regularly updated on its internal database, and Taikisha develops and manages a scheme whereby contracts are conducted only with the listed agencies.

Taikisha has introduced the Electronic Manifest scheme since 2009. It has been promoted by the Ministry of the Environment with the purpose of ensuring proper disposal of industrial waste. Taikisha's current introduction rate is 98.7%.

No. of Manifest issues/Electronic Manifest introduction rate



Management of Chemical Substances

Taikisha thoroughly manages chemical substances to reduce environmental impacts.

Efforts for Chemical Substance Management

To manage chemical substances handled in construction sites, Taikisha creates a Design Policy Plan and Site Environment Control Plan in the design and construction planning phases of each project based on the Environmental Impact Assessment Sheets and thereby manages relevant substances in an appropriate manner.

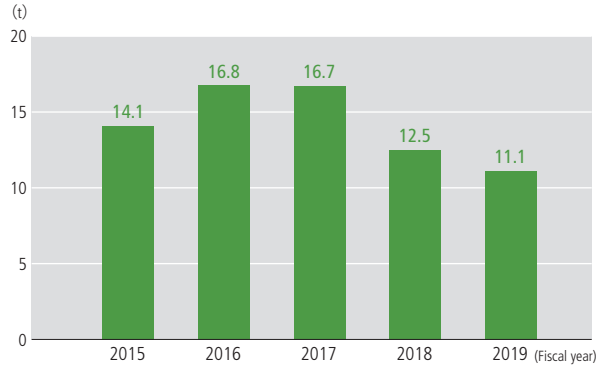
Before performing day-to-day on-site work, chemical substances to be used on the day are identified, and their risks are assessed.

The Research and Development Center isolates and properly manages chemical substances to be handled in the stage of creating the Development Plan for each research and development item.

Efforts for Freon Management

In compliance with the Act on Rational Use and Appropriate Management of Fluorocarbons, each business office creates Freon Collection Control Sheets and manages the status of filling, collection, and proper disposal of Freon (process management system). When conducting Freon collection work, Taikisha draws up Freon collection plans and procedures and endeavors to prevent Freon leaks and other accidents.

● Freon collection amount (collection rate: 100%)



Efforts for Water Resources

The preservation of water resources has become one of the crucial issues in line with climate change and population expansion.Taikisha is conducting designing operations from the viewpoint of efficient use and recycling of water resources and working to prevent water contamination and reduce wasteful water use in construction operations in accordance with environmental laws and regulations.

Column

Technical Center's Measures for Water Resources

In 2019, Taikisha opened the Technical Center in Zama City, Kanagawa Prefecture, as the new technological development hub of the Paint Finishing System Business. Having revamped and expanded part of the former Zama Technical Center and integrated it with the former Hirakata Development Center in Hirakata City, Osaka Prefecture, the Technical Center serves as a demonstration and public relations venue for clients and seeks to further enhance Taikisha's comprehensive development capabilities and quality assurance system.

Given that the Technical Center deals in facilities involved in painting processes that use the most water in automobile manufacturing, efforts are being made to develop technologies to save water and utilize alternative energy.

Specific examples include the development of a water-saving system in pretreatment and electrodepositing processes and devices that can separate air and paint mist without water.

Taikisha will continue making efforts to develop technologies that lead to the reduction of water usage and the efficient use of water.

Green Procurement

Taikisha is helping to reduce environmental impact through procurement activities conducted based on its own guidelines.

Green Procurement Policy

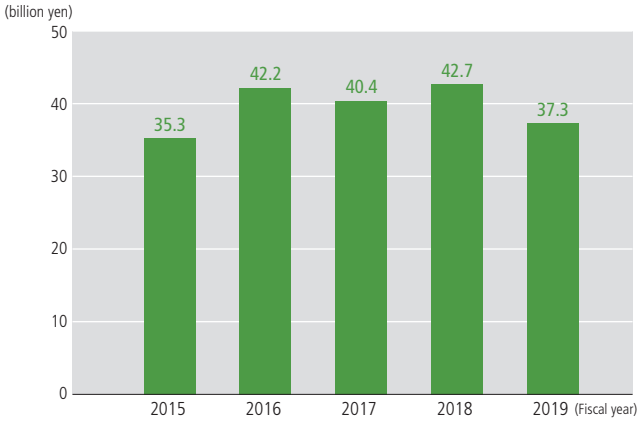
To lead the green procurement described in the Environmental Management Vision, Taikisha strives for preferential procurement and selection of new equipment, systems, working methods and technologies to help reduce environmental impact in business activities (design and construction). Taikisha has determined green procurement items based on its own standards, and grasps the results of procurement and conducts periodic reviews on these green procurement items.

Judging Criteria for the Green Procurement Items

Decision on whether or not items are acceptable as green procurement items shall be made after a comprehensive evaluation. This is based on how they contribute to reduction of environmental impact compared to conventional products with equivalent functions. Evaluation criteria are as follows:

1. Less environmental impact when equipment and materials are manufactured or operated (for consumption of energy and resources, etc.)
2. Use of recycled resources for production materials
3. Less environmental impact during construction (for waste generation, noise, vibration, etc.)
4. Less environmental impact during operation (for energy consumption, emission of harmful substances, etc.)
5. Long life expectancy (durability, easy renewal and convertibility, etc.)
6. Easy recycling after disposal
7. Easy processing after disposal (easy processing, whether or not it contains harmful substances, etc.)

Performance in Green Procurement



Adoption of Carbon Offset Products

Taikisha selects office supplies for its construction site offices from among the carbon offset applicable items so that Taikisha can help reduce environmental impacts. For example, Taikisha has adopted goods with carbon offset credits attached, provided by Yamanashi Prefecture under the Yamanashi Prefecture Project to Combat Global Warming by Forest Utilization, in an effort to promote procurement with consideration for conserving forest ecosystems.

Tree thinning work to protect the forest (Yamanashi Prefecture)

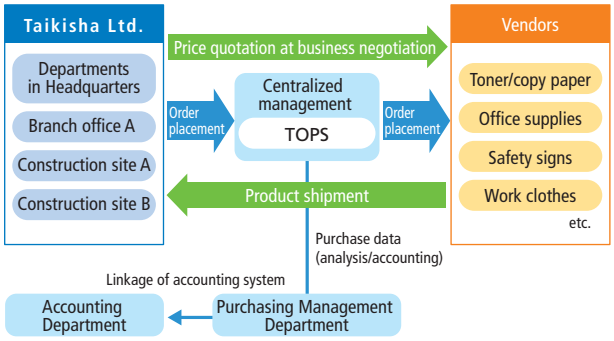
Carbon Offset Certification of a project

Promotion of Paperless Operations with Online Purchasing System

Taikisha has been promoting the use of TOPS, its online purchasing system for indirect materials. Users access the TOPS website to order and purchase various supplies ranging from daily necessities and office stationery regularly used to work clothes and safety-related products necessary at construction sites. The use of TOPS eliminates the need for processing conventional individual purchase invoices, and, by linking the online purchase system to the accounting system, drastically reduces the number of account slips used for payment, promoting paperless operations.

During FY2019, the total value of online purchase amounted to 90.033 million yen, and the ratio of paperless operations was 81.3%.

System flow diagram



Material Flow Diagram

Taikisha quantitatively grasps the overall picture of the environmental impacts associated with business operations to lead efforts for reducing environmental impacts.

INPUT

Business activities in the office

- Power consumption
  2,575,203 kWh (147 kWh/m²)
  Tally of 7 major locations*5 of consolidated subsidiaries
  7,792,435 kWh
- City gas 46,701 m³
  Tally of 7 major locations*5 of consolidated subsidiaries
  714,120 m³ (plus LPG87,914 m³)
- Amount of water used 6,847 m³
  Tally of 7 major locations*5 of consolidated subsidiaries
  372,120 m³
- Amount of copy paper purchased (units of A4-equivalent paper)
  10,013 sheets/person

Construction

- Amount of main materials for building air-conditioning systems*1
- Total cooling capacity of air-conditioning equipment 147,900 kW
- Total area of duct 606,745 m²
- Total volume of pipework 3,155 t

Office

Promotion of resource-saving activities in the office

Design

Energy-saving design at the design stage

Procurement

Energy-saving activities during procurement

Promotion of green procurement

Construction

Promotion of resource recycling at construction sites

Ensuring thorough Freon recovery

Ensuring thorough recovery of hazardous substances

Ensuring thorough reduction of VOC emissions

Energy-saving activities at the construction stage

Use of products

Energy-saving activities during the operation phase of sold products

OUTPUT

- General waste generated 55.5 t
  Tally of 7 major locations*5 of consolidated subsidiaries
  1,647 t

- CO_2 emission reductions at the stage of clients' operations
- Proposed CO_2 emission reductions in in-house design projects
  (95 proposals for CO_2 emission reductions; rate of CO_2 reductions: 24.3%)
  -24,333 t-CO_2/year
- CO_2 emission reductions from paint facilities*2
  -72.2 kg-CO_2/unit

- Scope 3: Category 4
  Upstream transportation and delivery
  21,720 t-CO_2

- Industrial waste generated*3 8,052 t
  Tally of 7 major locations*5 of consolidated subsidiaries
  256 t
- Amount of Freon recovered*3
  (collection rate: 100%) 11.1 t
- Amount of hazardous substances (lithium bromide, etc.) recovered*3
  (collection rate: 100%) 10.8 kℓ
- Reduction of VOC emissions at the stage of clients' operationss -8,200 t/year*4
- Amount of CO_2 reductions through resource-saving activities at the construction stage (due to improvement of construction method, such as introduction of prefabrication technique; CO_2 reduction rate: 43%) -312 t

- Scope 3: Category 11
  Use of sold products
  3,567,200 t-CO_2

*1. Projects that meet certain requirements are applicable.

*2. CO_2 emissions were calculated by using a calculation model for automobile paint lines (assuming the annual production capacity of 240,000 units in Japan).

*3. All projects are applicable (projects where Taikisha is the main contractor).

*4. Including overseas operations.

*5 Tallied locations are USA, Thailand, China, Vietnam, the Philippines, India and Italy