

SANYO DENKI

Environmental data book 2018

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# Message from the Major Operating Officer



## Management Plan and Environmental Preservation

The SANYO DENKI Group launched its eighth medium-term management plan in April 2016. The management plan is wide-ranging and we are conducting numerous measures, the function and output of which will lead to preserving the environment. The main initiatives under this management plan are “World-Leading Product Development,” “Borderless,” “Real Time” and “Factory Automation.” Measures including world-class product development, real time information sharing within the Group and the creation of production systems all lead to preserving the environment. Through this management plan, the SANYO DENKI Group will engage in corporate activities that contribute to the realization of a recycling-oriented society by achieving these objectives.

Automated, real time factory production and production management systems are efforts that will enhance efficiency within the Group. This initiative will share and process customer, delivery and production status information in real time throughout the Group, enabling increased productivity through automated production. With the various processes surrounding production automated in real time, we will contribute to the conservation of energy and other resources.

World-leading product development is an activity that contributes to customer energy conservation and other environmental activities globally through new products. The development of power conditioner products such as photovoltaic and wind power generators contributes to the use of renewable energy, while high-efficiency motor products and control devices, the development of products that realize unprecedentedly high performance and the deployment of these products in the market contribute to the conservation of resources and energy.

The SANYO DENKI Group will engage in the global promotion of this management plan leading to environmental preservation. We want to be a corporate group that is trusted and needed by society. We ask our stakeholders for their understanding and support in all our business activities and environmental preservation efforts.

Representative Director  
Vice President

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## Scope of the report

Organizations covered by the report: The Head Office, the Technology Center and factories in Japan (Kangawa Works, Shioda Works and Fujiyama Works)

Period: Fiscal 2017 (from April 1, 2017 through March 31, 2018, in principle)



# Environmental Policy and Environmental Management System

## Environmental Policy

### Basic Philosophy

SANYO DENKI helps preserve the global environment and enhance humanity's prosperity through its corporate activities for society and the environment.

### Basic Policy

SANYO DENKI CO., LTD., comprising Kangawa Works, Shioda Works, Fujiyama Works, Technology Center and Head Office, develops, designs, manufactures and sells cooling fans, UPS, power conditioners for photovoltaic generation system, engine generators, servo systems, stepping systems, controllers, encoders, and driving devices. Under the principles listed below, each member of SANYO DENKI will take part in eco-friendly activities to help preserve our abundant global environment.

1. To enhance our environmental performance, we will continuously improve the environmental management system and work hard to prevent pollution and reduce the environmental impact of our activities.
2. We will assess the environmental impact of our corporate activities and focus on our environmental targets. We will also deal with the following as high-priority themes for environmental management.
  - (1) Develop, design, manufacture, and sell environment-friendly products
  - (2) Reduce or eliminate the use of hazardous chemicals
  - (3) Reduce the environmental impact (energy consumption, number of copies, waste, etc.) of business activities
  - (4) Contribute to the local community
  - (5) Protect biodiversity and ecosystem
3. We observe environmental laws, restrictions and other rules relevant to our company and work hard for environmental preservation.
4. We document, carry out and maintain our environmental principles, make them known to all our employees, and ask that our employees both cooperate in the pursuit of these principles and reflect them in our environmental management.
5. We will review the environmental management system periodically.
6. We will openly publicize the environmental principles to parties in and outside the company.

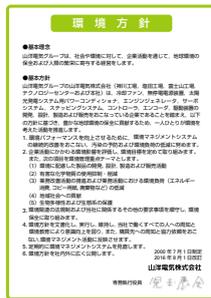


# System

It has been 18 years since the Environmental Committee was established in April 2000. The committee has been working to maintain a level of energy saving and waste reduction in sites since fiscal 2004. In addition to reducing environmental burdens, the committee is also striving to reduce the volume of hazardous chemical substances and develop Eco-products to achieve its major environmental management goals.

## Major Responsibilities of the Environmental Committee

1. Formulation of policies on environmental conservation activities, and reporting and instructions on the same
2. Formulation and enforcement of company rules and procedures (including company-wide environmental manuals) concerning environmental conservation activities
3. Promotion of environmental conservation activities at the head office, factories and branch offices through those in charge of environmental management
4. External contacts concerning company-wide environmental conservation activities
5. Surveys on social situations relating to environmental conservation activities

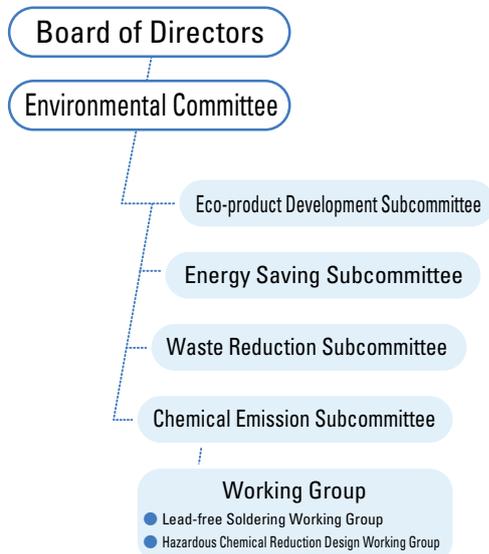


Environmental Policy Brochure

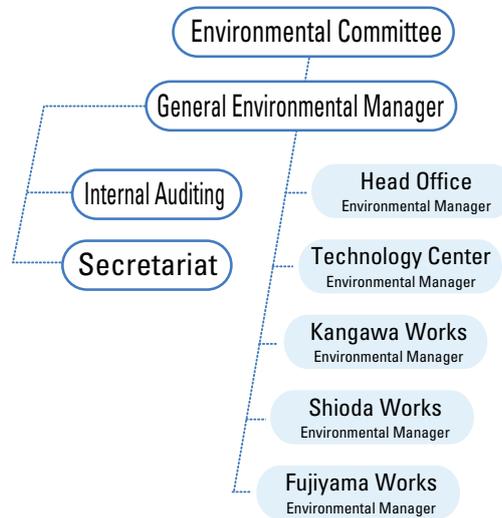


Environmental Committee

## Positions within the Environmental Committee and Its Structure



## Organization Chart for the Environmental Management System



### ○ Eco-product Development Subcommittee

It promotes the development of competitive products designed to protect the environment in accordance with eco-design standards.

### ○ Energy Saving Subcommittee

It promotes energy saving through its daily activities the EMS (environmental management system). It also formulates long-term energy-saving strategies and proposes cost-effective investments.

### ○ Waste Reduction Subcommittee

It works to reduce waste and disposal costs and achieve zero emissions.

### ○ Chemical Emission Reduction Subcommittee

It strives to reduce emissions of hazardous chemical substances and minimize environmental pollution via self-management. It also works to promote the use of lead-free soldering and lead-free electric wires, reduce hazardous chemical substances, and develop measures for the PRTR (pollutant release and transfer register).

# Activity Report and Goals

Activity		Fiscal 2017		Fiscal 2018		
		Goal	Track record	Goal		
Promotion of eco-design		Creation of Eco-products	Nineteen new products certified as Eco-products	Creation of Eco-products		
Sales ratio of Eco-products (by business division)	Coolong Systems Division	44%	44%	46%		
	Power Systems Division	45%	34%	47%		
	Servo Systems Division	36%	37%	37%		
Reduction of hazardous chemical substances		Use of lead-free soldering Development of products with reduced amounts of RoHS-6 hazardous substances Reduction of substances defined in the PRTR Law	Lead-free solder usage:nearly 100% The RoHS-6 hazardous substance directive:almost all models of cooling fans, stepping motors and servo motors are complied with.	Promotion of the use of lead-free solder Implementation of measures to meet the RoHS & REACH standards Reduction of PRTR-controlled substances		
Reduction in power consumption	Kangawa Works	(3%)	4%	Reduction by 12% compared to fiscal 2006		
	Shioda Works	75%	75%			
	Fujiyama Works	4%	5%			
	Technology Center	(2%)	11%			
	Head Office	15%	22%			
Reduction in fuel consumption	A-type heavy oil *Total of the Shioda and Fujiyama Works	262kl	20%	271kl	18%	Consumption of LPG (Technology Center) Maintaining it at the current level (reduced by 52% compared to fiscal 2000) Consumption of LPG (Fujiyama Works) Maintain at the fiscal 2013 level Consumption of A-type heavy oil Maintaining it at the current level (reduced by 21% compared to fiscal 2000) Consumption of town gas Reduction by 10% compared to fiscal 2010
	LPG *Total of the the Technology Center	44,000m <sup>3</sup> N	47%	42,400m <sup>3</sup> N	49%	
	Town gas * Total of the the Kangawa Works	886,000m <sup>3</sup> N	(24%)	820,000m <sup>3</sup> N	(15%)	
	LPG *Total of the Fujiyama Works	41,000m <sup>3</sup> N	(52%)	40,900m <sup>3</sup> N	(52%)	
Reduction in the use of copy paper	Kangawa Works	(18%)	(25%)	Maintaining it at the current level (reduced by 15% compared to fiscal 2000)		
	Shioda Works	85%	94%			
	Fujiyama Works	4%	14%			
	Technology Center	30%	48%			
	Head Office	47%	52%			
Reduction of waste	Kangawa Works	(16%)	(14%)	Maintaining it at the current level (reduced by 0% compared to fiscal 2000)		
	Shioda Works	73%	88%			
	Fujiyama Works	44%	37%			
	Technology Center	34%	33%			
	Head Office	67%	67%			
Contribution to local communities		Head Office, Technology Center, Cleaning of areas around the factories conducted at least once every month	Goal achieved	Cleaning of the area around sites at least once every month Participation in environment-related events		
Promotion of zero emission	Company-wide waste recycling rate	99.6% or higher	99.7%	99.6% or higher		

Note 1: The reduction rate is calculated using fiscal 2000 as the base year, except for electric power and town gas, for which fiscal 2006 and 2010 were used as the respective base years.

Note 2: Figures in parentheses indicate increases.

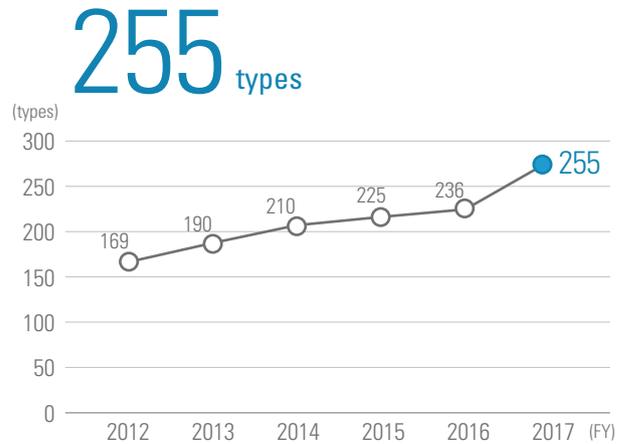
# Product Development

## Eco-products

### Efforts for designing Eco-products

As for product design, we are carrying out R&D to incorporate the latest energy-saving technologies into our new products. At the same time, we carry out product assessments to evaluate the environmental impact of products at each stage, such as component and material procurement, manufacture, distribution, use, recycling, and disposal. Newly developed products are compared with commercially available and existing products and are certified as Eco-products (Eco-design products) if they satisfy the specified evaluation standards. We created 19 eco-design products (Eco-products) in fiscal 2017. We will continue to promote the LCA-based development of products designed to reduce CO<sub>2</sub> emitted during their use and to be eco-friendly.

Number of products certified as eco-products  
(Total number of products in all divisions)



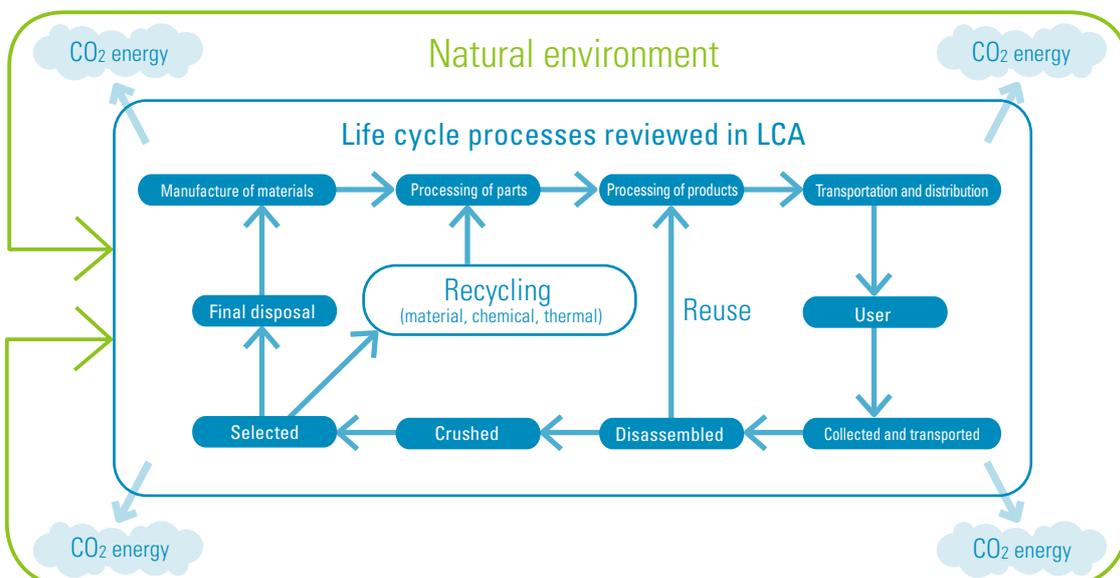
### Life cycle assessment (LCA)

LCA is one of the techniques used to provide a general quantitative measure of levels of environmental impact including global warming that products have through their life cycles. We evaluate the environmental compatibility of a product using this method. Our rate of implementing LCA in our Eco-products was 90% in fiscal 2017.



Eco-products are presented in catalogues and other materials with a LEAF symbol.

### Life Cycle Processes Reviewed in LCA



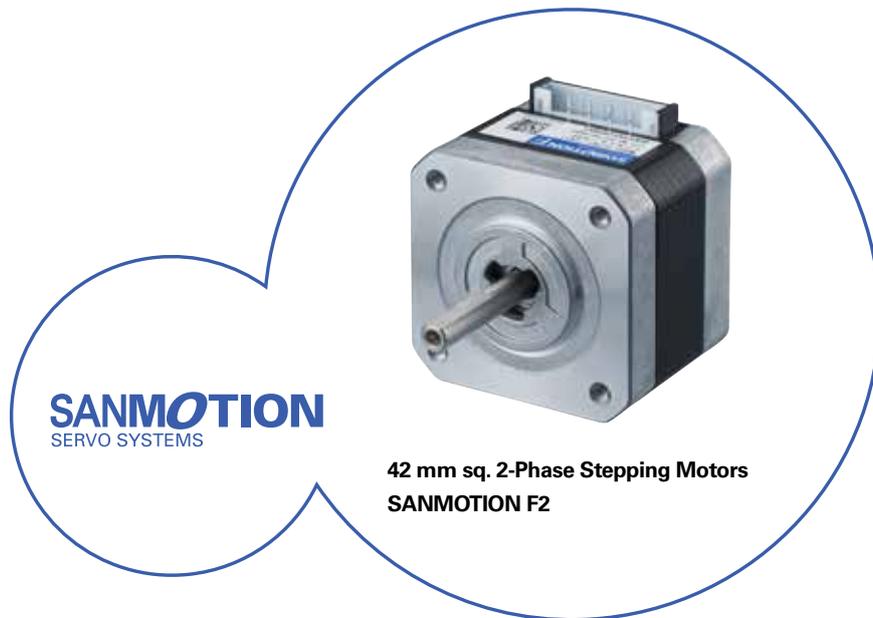
Effects on the natural environment (global warming) are assessed at each stage of the life cycle, based on energy consumption and the amount of CO<sub>2</sub> emissions.

# Product Development

## Eco-products of Fiscal 2017

### Results of LCA

Nineteen new Eco-products were developed in fiscal 2017. The results are based on a comparison of the amounts of CO<sub>2</sub> emitted during the time of use between newly developed models and their immediate predecessors. Since these products are used for a long time, the reduction of CO<sub>2</sub> emitted during the time of use will be effective in preventing global warming.



**42 mm sq. 2-Phase Stepping Motors  
SANMOTION F2**

CO<sub>2</sub> emissions

**4.3%** ↓

Models used for LCA comparison

New model : SF2422-12U41

Conventional model : 103H5208-0440

## Energy Saving

### Specific Energy-Saving Measures

As a countermeasure against global warming, we consider the restriction of CO<sub>2</sub> emissions through energy-saving activities as our top-priority task, and are promoting the improvement of energy use efficiency and energy saving activities. Compared with the preceding fiscal year, in fiscal 2017 higher production volumes led to an increase in power consumption, and CO<sub>2</sub> emissions increased. These amounts were down per unit of production.

### Results of Introduction

- Updated to inverter-controlled compressors at the Kangawa and Shioda Works.
- Updated all canned and bottled beverage vending machines located inside the Ueda Works, reducing power consumption.
- The reflow furnace newly installed at the Fujiyama Works was built with thermal insulation to lower equipment surface temperatures and reduce power consumption.



Compressors



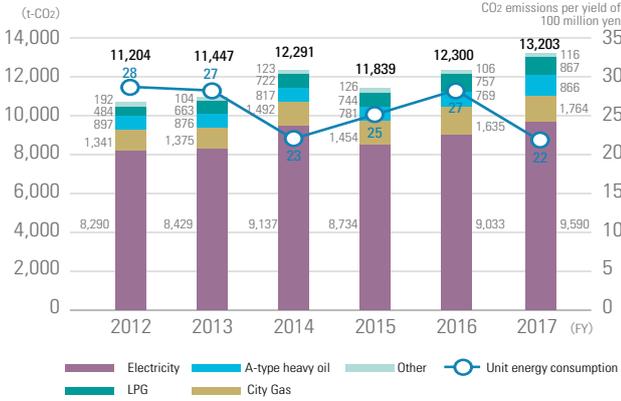
Canned and bottled beverage vending machines



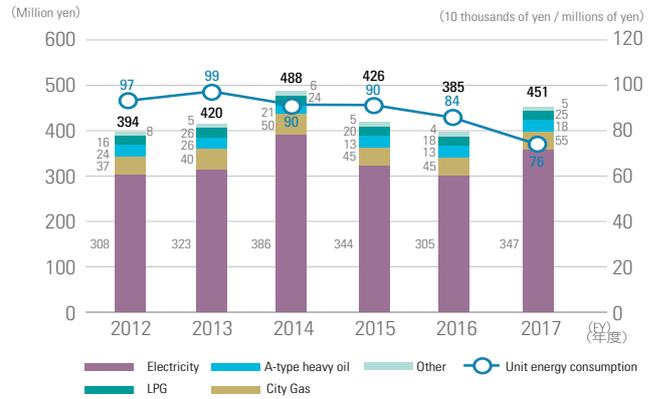
Reflow furnace

# Energy Saving

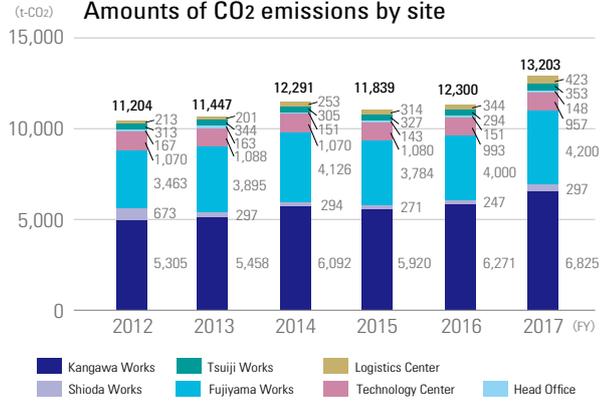
### Energy consumption measured in terms of the amount of CO2



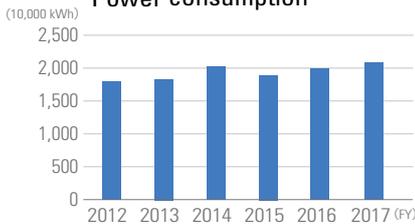
### Consumption value per production value



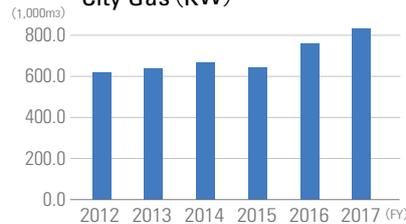
### Amounts of CO2 emissions by site



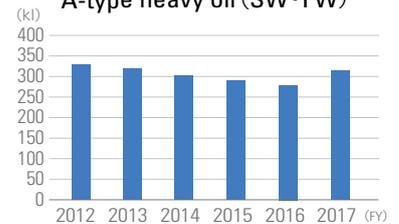
### Power consumption



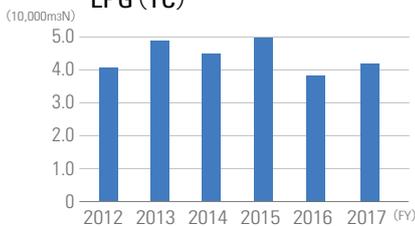
### City Gas (KW)



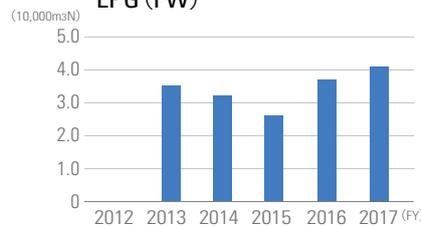
### A-type heavy oil (SW•FW)



### LPG (TC)



### LPG (FW)



# Energy Saving

## Energy Saving Measures Implemented in Manufacturing Processes at Factories

Works	Measures	Effects
Kangawa Works	<ul style="list-style-type: none"> <li>(1) Cutting down on unnecessary lighting in warehouses and on equipment</li> <li>(2) Promoting electricity savings when equipment is in standby status</li> <li>(3) Promoting the use of solar power</li> <li>(4) Promoted electric power conservation by introducing energy-saving equipment.</li> </ul>	<ul style="list-style-type: none"> <li>(1) Saving electricity by limiting the amount of lighting</li> <li>(2) Reduction in commercial electricity by powering equipment down to power saving mode when materials are out or when equipment is not in use</li> <li>(3) Savings in commercial power use</li> <li>(4) Reduced commercial power through optimal condition operations.</li> </ul>
Shioda Works	<ul style="list-style-type: none"> <li>(1) Affixing calendar timers to machines</li> <li>(2) Promoted production equipment revisions and automation.</li> <li>(3) Systematic operation of boilers according to weekly calendar timers</li> </ul>	<ul style="list-style-type: none"> <li>(1) Savings in electricity by preventing switches from being left on</li> <li>(2) Improved productivity, conserved electric power.</li> <li>(3) Control of the use of A-type heavy oil</li> </ul>
Fujiyama Works	<ul style="list-style-type: none"> <li>(1) Adjusting the operating hours of air conditioners</li> <li>(2) Shifting the operating hours of production equipment</li> <li>(3) Adjusting the operating hours of loading equipment for tests</li> <li>(4) Promoting the use of solar power</li> </ul>	<ul style="list-style-type: none"> <li>(1) Energy savings through reduced operating hours and reduced the use of heavy oil A.</li> <li>(2) Savings in commercial power</li> <li>(3) Savings in electricity by reviewing the test run time</li> <li>(4) Savings in commercial power</li> </ul>



Solar panels at Kangawa Works



Solar panels at Logistics Center



Solar panels at Fujiyama Works



PV Inverters at Fujiyama Works

## Transportation

Our company is using vehicles that comply with the regulations on diesel car exhaust in seven municipal communities to transport supplies between factories. A company-wide "Stop Idling" campaign is also under way, in order to reduce the environmental burden.



Signboard for stop idling



Low emission vehicles



Electric vehicles



Vehicle that complies with the regulations on diesel car exhaust

# Reuse & Recycling

## Zero-emission Activities

In fiscal 2017, we promoted recycling by announcing an average recycling rate of 98% for the entire Company.

This goal was achieved as a result of our efforts to stop producing wastes that are simply buried or incinerated through all-out reduction and recycling of general and industrial wastes that occur in our production activities.

## Reuse

We promote in-house recycling of unneeded supplies such as OA equipment, desks, shelves and chairs.

## Reuse of Materials

We return the wooden and plastic pallets used to transport purchased parts and materials to companies transporting them and reuse such pallets among our bases and cooperating companies. We also crush wooden pallets into chips, which are used for mulch at greenery around our sites.

### [Other examples of reuse of materials]

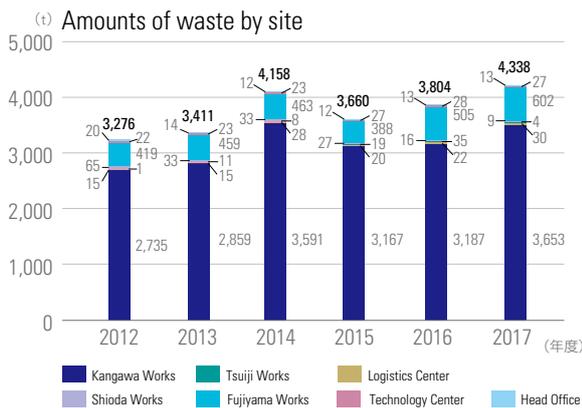
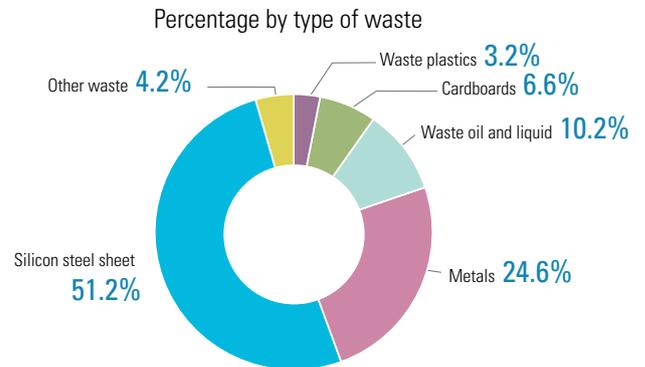
Cardboard boxes: returned to suppliers, reused as shock absorbers

Shock absorbers: reused within the company

Inscription board mounts: recycled



Wood crusher



# Chemical Substance Management

## Establishment and Use of Chemical Substance Management Guidelines

In August 2005, we established our Chemical Substance Management Guidelines for the management of hazardous substances, concerning parts and materials used for our company's products. Our Guidelines provide management rules concerning substances specified in various laws and regulations, such as substances whose use is restricted or prohibited by the RoHS Directive, SVHC (highconcern material) in REACH, substances banned by domestic and foreign legislation, and ordinance on prevention of hazards due to specified chemical substances. We keep these guidelines up-to-date by making necessary revisions in response to changes in relevant laws and regulations (last updated in March 2018). These include definitions of terms, RoHS threshold values, survey questionnaires for our suppliers on chemical substances that affect the environment, and a guarantee form to assure that no RoHS-restricted substances are included in the materials we use. Currently, we request that our suppliers agree to abide by our Guidelines, and that they submit a survey questionnaire and a guarantee form to assure that their supplies contain no RoHS-restricted substances.

## Green Purchases

Our company actively purchases stationery and office supplies that are environmentally friendly, such as products using recycled materials, substitute materials and waste materials, refillable products, products with replaceable parts, and products designed for recycling.

## Reduction of Hazardous Chemical Substances

The Hazardous Chemical Reduction Design Working Group, a subordinate body of the Chemical Emission Subcommittee, is working together with the design sections of business divisions to focus on dealing with regulated substances or those banned by the RoHS directive.

- Expanding the number of models that comply with the RoHS directive (six substances)  
Cooling fans and stepping motors are now compliant. Servo motors, servo amplifiers, stepping motor drivers, and power supply systems are on their way toward becoming compliant. Models complying with the RoHS directive are expanding.
- We are conducting inclusion surveys and finding alternatives for phthalic esters (four substances) that have been added to the RoHS directive. (planning to become compliant by July 2018)
- Inclusion surveys and alternatives for new chemicals and additional regulated substances are being dealt with.
- An examination of substances will be conducted upon the request of the customer.
- An examination of hazardous chemical substances contained in our products is under way, based on the Chemical Substance Management Guidelines.
- RoHS six substances contained in procured materials are being analyzed using an X-ray fluorescence analyzer (XRF).
- We are conducting inclusion surveys for SVHC materials (substances of high concern: 181 substances) in REACH regulations and providing information to our customers.
- We are conducting inclusion surveys according to AIS specified by JAMP (Joint Article Management Promotion Consortium), and providing information to our customers.
- Established an operation system and provided information to customers with respect to the transition from AIS to the chemSHERPA scheme that facilitates the sharing of information on chemical substances in products.

- RoHS Directive (DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restrictions on the use of certain hazardous substances in electrical and electronic equipment): Six substances (lead, chromium hexavalent, cadmium, mercury, and two specific brominated flame retardants [PBD, PBDE])
- REACH (Registration, Evaluation, Authorization and Restriction of Chemicals): A comprehensive system for registration, evaluation/approval, and restriction of chemical substances in Europe
- AIS: An information exchange sheet that the Joint Article Management Promotion Consortium (JAMP) uses to transmit information on the chemical substances contained in products.
- chemSHERPA: A scheme developed under guidance by the Ministry of the Environment for transmitting information on chemical substances contained in products throughout the supply chain. Operated by JAMP.

## Lead-free solder

The Fujiyama Works, which manufactures cooling fans, has been using lead-free solder for high-temperature soldering since March 2006, following the introduction of lead-free solder in all manufacturing processes in January 2004 (except for high temperature soldering exempted from the RoHS standards.) As for production lines mounting substrates for servo amplifiers and power supply systems, lead-free soldering facilities were first installed in fiscal 2004, and full installation has finally been completed.

- Cooling fans, stepping motors, servo motors: Installation of equipment for surface mount soldering has been completed.
- Servo amplifiers, stepping motor, drivers: Lead-free solder is being implemented and expanded to RoHS-applicable products. A shift towards lead-free products is being promoted.
- Power supply devices: Lead-free solder is being implemented and expanded to RoHS-applicable products. A shift towards lead-free products is being promoted.

# Chemical Substance Management

## Compliance with the PRTR

Our company registers and reports the amount of discharge and transportation of reportable PRTR-controlled substances when over one ton is consumed at a factory annually.

In fiscal 2017, notification became required on styrene, which is used at the Kangawa Works, as well as phosphoric acid triphenyl, methylnaphthalene, antimony and their compounds, which are used at the Fujiyama Works.

Lead has not been required to be reported for the last 11 years because of the reduction of lead usage due to RoHS-compliant soldering.

PRTR (pollutant release and transfer register): A system for collecting, aggregating and publishing data on various hazardous chemical substances to see how much of these substances are released into the environment from what sources, or are transferred with waste from what facilities.

PRTR-controlled substances	PRTR-controlled substances (that are required to be reported and used in amounts of one ton or more)	
Styrene	Kangawa Works	17.0t
Triphenyl phosphate	Fujiyama Works	3.4t
Methylnaphthalene	Fujiyama Works	3.1t
Antimony and its compounds	Fujiyama Works	2.7t



An X-ray fluorescent analysis device at the Kangawa Works



Lead-free high-temperature soldering equipment at the Fujiyama Works

# Environmental Accounting

SANYO DENKI has been employing an environmental accounting system since fiscal 2003 with the aim of implementing efficient and effective measures for environmental conservation. We measure the costs required for environmental conservation in our business activities and the effects produced by these activities using quantitative indicators (measured in terms of monetary units or physical quantities) to the greatest extent possible, and analyze these costs and effects in order to improve the efficiency and activity levels of environment management.

## Performance in fiscal 2017

### (1) Environmental Conservation Costs

Environmental Conservation Costs in fiscal 2017 were 1,101 million yen in total: 49 million yen for investment and 1,052 million yen for costs and expenses. Investments as global environmental costs included the installation of additional air conditioners at the Fujiyama Works and LED outdoor lighting at the Logistics Center, and as R&D costs, included efforts to develop products designed for the environment. As for costs and expenses, R&D costs and management activities costs posted the high rates of 58.7% and 26.8%, respectively.

### (2) Environmental Conservation Effects

Due to the impact of higher factory production volumes, we saw positive impacts on all resources used as inputs for business activities, with the exception of light oil consumption. In particular, the introduction of the energy has increased CO<sub>2</sub> emissions by 858 tons, and electric power consumption by 122 thousands kWh, as compared with the previous fiscal year.

### (3) Economic Effects

Due to the impact of higher factory production volumes, cost savings due to energy conservation increased approximately 17% year on year, to ¥45 million. Profits from sales of useful materials were 100 million yen, up about 65% from the previous year.

Also, efforts to promote paperless operations throughout the Company resulted in an approximately 37% decline in the use of copy paper and copy costs compare to the pervious fiscal year, a reduction of ¥21 million.

"Environmental Accounting Guidelines" published by the Ministry of the Environment, Format for publication C

Data range (company-wide)

Period covered: April 1, 2017 to March 31, 2018

Environmental Conservation Costs		(In thousands of yen)		
Category	Details of major activities	Investment	Cost	
(1) Costs within the area of business	1. Pollution prevention costs	Air pollution prevention (measurement of smoke and soot) Water pollution prevention (inspection of wastewater treatment tanks, extraction of sludge, sewage disposal, etc.)	0	24,934
	2. Global environment conservation costs	Periodic electricity checks	9,886	35,383
	3. Resource recycling costs	Reduction of waste, recycling, and proper waste disposal	0	66,880
	Total of items 1 through 3		9,886	127,197
(2) Upstream and downstream costs	Green procurement of office supplies and commissions for refurbishing and reconditioning products	0	18,951	
(3) Administration costs	Development and operation of EMS and environmental training for employees	0	282,000	
(4) R&D costs	Development of Eco-products (such as testing equipment and molds)	39,326	617,301	
(5) Social activity costs	Annual membership fee for the Japan Environmental Management Association for Industry, and other fees	0	6,226	
(6) Environmental damage measure costs	Assessment of soil contamination, and costs for countermeasures	0	0	
Total		49,212	1,051,675	

Expenses include depreciation of facilities and personnel costs.

# Environmental Accounting

## Effects of Environmental Conservation

Classification	Indicators for the effects of environmental conservation			
	Indicators for environmental burdens	Indicators	Indicator value <sup>(Note)</sup>	
Effects on resources input for business activities	Input of energy	Decrease in energy consumption	Energy consumption measured in terms of the amount of CO <sub>2</sub> : △ 858 t-CO <sub>2</sub>	
			Electricity consumption : △ 1,220,000 kWh	
			A-type heavy oil consumption : △ 36 kL	
			LPG consumption: △ 37 t	
			Kerosene consumption: △ 0.8 kL	
			Light oil consumption: 0.6 kL	
			Town gas consumption: △ 60,000 Nm <sup>3</sup>	
Effects on environmental burdens due to emissions and waste produced by business activities	Discharge of waste and other materials	Decrease in the total discharge of waste and other materials	Total discharge of waste: △ 533 t	
			Increase in the percentage of recyclable materials in the total discharge of waste	Recyclable materials and useful materials: △ 0.005%
			Decrease in the discharge of hazardous waste	Discharge of hazardous waste: 4.5t
Effects on resources input for business activities	Input of water	Decrease in water consumption	Water consumption: △ 6,300 m <sup>3</sup>	
	Input of other resources	Decrease in the input of other resources	Copy paper consumption: 842,000 sheets	

△ : Indicates that there was no difference compared to last year.

Note: The measure of the amount will be stated as the difference from the amount of the reference period compared with the year.

## Economic Effects of Environmental Conserving Measures (Substantive Effects)

(In thousands of yen)

Classification		Amount
Profits	Sales of useful materials	99,691
Reduction of costs	Reduction of costs by energy saving	△ 65,640
	Reduction of waste disposal costs by recycling	△ 3,766
	Reduction of expenses for copy paper	11,960

△ : Triangles indicate that there was no difference compared to last year.

# Activities at Offices and Works / Environmental Managers

## General Environmental Manager Hiroyuki Nishimura

SANYO DENKI established its environmental management system and obtained ISO14001 certification in 1999. Our general environmental manager works in the environmental management system under the direction of the top management to promote environmental activities at each of our sites. In addition to the energy conservation and waste reduction activities at each site, we aim to reduce the global environmental burden by developing high-efficiency energy-saving products for our customers and providing power equipment to reduce consumption using maximum power peak cutting functions and regenerating electric power from braking forces. We also disclose environmental information to a wide spectrum of both internal and external stakeholders and place great importance on communication with local communities and relevant individuals. The Environmental Committee works with environmental managers at our sites to organize specialized subcommittees in order to discuss measures for ongoing environmental improvements and to take an active part in promoting environmental conservation activities to achieve our goals.

The number of employees is as of March 2018.

### Head Office Satoshi Hashiguchi



Location : 3-33-1 Minami-Otsuka, Toshima-ku, Tokyo  
Area : 3,378 m<sup>2</sup>  
Number of employees : 264  
ISO certificate obtained : March 2002



At head office, operations are conducted by the sales, administrative and business divisions. Important targets for reducing our environmental impact include increasing the percentage of sales accounted for by eco-products, conserving energy, separating and reducing trash, decreasing copy paper usage and volunteering in local area clean-ups.

- Ascertaining and increasing the percentage of sales accounted for by eco-products in each division
- Power consumption reductions
- Separating and reducing trash
- Waste recycling rate improvements
- Promoting paperless operations in order to reduce the amount of copy paper used
- Volunteering in local area clean-ups

Going forward, all divisions will continue to promote environmental activities.

### Technology Center Hiroyuki Nishimura



Location : Ueda Research Park, 812-3 Shimonogo, Ueda-shi, Nagano  
Area : 44,908 m<sup>2</sup>  
Number of employees : 307  
ISO certificate obtained : November 1999



Our Technology Center is engaged in the design and development of products, and is committed to promoting eco-designs and developing products that are free of hazardous chemicals. To promote the development of products designed for the environment, we certified 19 new items as Eco-products in fiscal 2017. With regard to the design of products that contain no hazardous chemical substances, we have nearly completed compliance with the RoHS Directive. Currently, we are working to comply on the four additional substances specified in under the RoHS Directive and substances of very high concern (SVHC) under REACH. We have also worked to reduce the consumption of electricity, LPG and copy paper, as well as the amount of waste, and cleaned areas around the Ueda Research Park for the local community. We will continue to promote energy savings with high efficiency products designed to be environmentally friendly, reuse of electric energy using power regeneration functions, etc., in order to help customers reduce their environmental burden when using our products.

## Kangawa Works Kazuhiko Takizawa



Location : Ueda Research Park, 812-3 Shimonogo, Ueda-shi, Nagano  
 Area : 67,140 m<sup>2</sup>  
 Number of employees : 407  
 ISO certificate obtained : March 2010  
 Major products : AC / DC servo motors, stepping motors, and linear servo motors



The Kangawa Works is working on automation and process improvements for energy savings, cutting down on lighting, waste reduction, curtailed use of copy paper, and the promotion of zero emission.

- In the motor assembly and inspection processes, a production and inspection guidance system has been introduced to prevent operational mistakes and accidental leakage of defective products so that unnecessary processes can be omitted. Also, the use of paper check sheets has been discontinued, leading to a reduction in copy paper use.
- Made efforts to conserve energy through automation using servo systems.
- Made efforts to eliminate waste (waste plastic and cardboard boxes) and achieve zero emissions.
- Engaged in the large-scale cleaning of the surrounding area in cooperation with the neighborhood community association.
- Working on further reduction of environmental burdens through the use of the BEMS central monitoring system that can oversee the energy consumption of the entire site.

## Shioda Works Satoshi Atou



Location : 517 Goka, Ueda-shi, Nagano  
 Area : 5,698 m<sup>2</sup>  
 Number of employees : 9  
 ISO certificate obtained : March 2001  
 Major products : Stepping motors



The Shioda Works is promoting activities to save energy, reduce waste, and eliminate hazardous substances from the manufacturing processes.

- Reduction in power consumption (planned operation of air conditioners by using timers and checking room temperatures, and a conserved power through increased production efficiency)
- Reduction in the consumption of A-type heavy oil (planned operation of boilers using timers)
- Reduced amount of copy paper used (promoted elimination of forms)
- Strict separation of trash
- Use of components and materials meeting the RoHS directive
- Volunteer activities for cleaning areas around the factory
- Reduction of incinerated waste (ongoing surveillance and detailed analysis of waste)

## Fujiyama Works Shunsuke Niimi



Location : 4016 Fujiyama, Ueda-shi, Nagano  
 Area : 99,828 m<sup>2</sup>  
 Number of employees : 371  
 ISO certificate obtained : December 1999  
 Major products : Cooling fans, UPS's (uninterruptible power supply devices), power conditioners for photovoltaic power generation systems, emergency self-power generation systems, power source monitoring systems, AC / DC servo amplifiers, stepping drivers and system controllers.



The Fujiyama Works operates its production activities in the F1, F2 and F3 wings which are occupied by the Cooling Systems Division, Power Systems Division and Servo Systems Division, respectively. Each division is working on the reduction of environmental burdens, automation, energy saving and waste reduction and zero emissions through improvements of their operations. In fiscal 2018, our efforts will continue toward the achievement of our environmental goals.

- Reduction in the consumption of electricity and A-type heavy oil
- Reduction in the consumption of lead by using lead-free solder
- Reduction of waste (waste plastics and cardboards) and zero emission activities
- Use of components and materials meeting the RoHS directive
- Volunteer activities for cleaning areas around the factory

# Data Summary

## Data on Air Quality, Water Quality, and Noise

Kangawa Works	Item	Regulatory standard	Voluntary standard	Actual value
Air quality <small>Air pollution control laws and ordinances</small>	Smoke and soot (g/m <sup>3</sup> N)	Exempted (No applicable facilities)		
	Nox (ppm)			
	Sox (m <sup>3</sup> N/h)			
Water quality <small>Water pollution control laws, ordinance and agreements</small>	PH (pH)	5.8 ~ 8.6	—	7.8
	BOD (mg/L)	20	19	18.0
	SS (mg/L)	30	28	15.0
Noise <small>Laws, ordinances and agreements for noise regulation</small>	(dB)	65	64	62

Shioda Works	Item	Regulatory standard	Voluntary standard	Actual value
Air quality <small>Air pollution control laws and ordinances</small>	Smoke and soot (g/m <sup>3</sup> N)	0.3	0.03	0.0052
	Nox (ppm)	180	130	100
	Sox (m <sup>3</sup> N/h)	1.4	0.7	0.011
Water quality <small>Water pollution control laws, ordinance and agreements</small>	PH (pH)	Exempted (No water disposal tank)		
	BOD (mg/L)			
	SS (mg/L)			
Noise <small>Laws, ordinances and agreements for noise regulation</small>	(dB)	65	64	50

Technology Center	Item	Regulatory standard	Voluntary standard	Actual value
Air quality <small>Air pollution control laws and ordinances</small>	Smoke and soot (g/m <sup>3</sup> N)	Exempted		
	Nox (ppm)	150	130	85
	Sox (m <sup>3</sup> N/h)	Exempted		
Water quality <small>Water pollution control laws, ordinance and agreements</small>	PH (pH)	5.8 ~ 8.6	—	7.6
	BOD (mg/L)	20	19	17.0
	SS (mg/L)	60	54	12.0
Noise <small>Laws, ordinances and agreements for noise regulation</small>	(dB)	Exempted		

Fujiyama Works	Item	Regulatory standard	Voluntary standard	Actual value
Air quality <small>Air pollution control laws and ordinances</small>	Smoke and soot (g/m <sup>3</sup> N)	0.3	0.03	0.0051
	Nox (ppm)	180	130	68
	Sox (m <sup>3</sup> N/h)	5.0	2.5	0.046
Water quality <small>Water pollution control laws, ordinance and agreements</small>	PH (pH)	5.8 ~ 8.6	—	7.5
	BOD (mg/L)	50	48	19.0
	SS (mg/L)	60	54	41.0
Noise <small>Laws, ordinances and agreements for noise regulation</small>	(dB)	Exempted		

## Waste Recycling Data

Waste		Amount discharged (tons)	Amount recycled (tons) / Recycling rate (%)	Recycling method
Sludge	Organic sludge	6.7	6.7 / 100	After oil and water are separated, dehydrated residues are turned into compost.
	Inorganic sludge	28.2	26 / 92.3	After intermediate treatment, some of the sludge is recycled as road construction materials. Some is also gasified by furnaces, with residues recycled as cement materials.
Waste liquid	Oil-based materials	4.4	3.8 / 87.1	After oil and water are separated, the material is recycled as fuel.
	Water-soluble materials (detergents, grinding liquid, etc.)	274.5	274.5 / 100	Reuse and incinerated residues are used as cement materials.
	Volatile materials	5.9	5.9 / 100	Distilled and used as recycled oil.
	Waste acid (batteries)	97.0	97.0 / 100	Crushed, sorted, and all recycled.
Waste plastics	OA equipment and circuit boards	30.4	30.4 / 100	Crushed, sorted, and all recycled.
	Vinyls and films	57.8	57.8 / 100	Turned into solid fuel (refuse derived fuel), reducing agents (using furnaces), and materials for power generation (thermal recycling)
	Molding scraps	36.8	36.8 / 100	
	Other solid scraps	8.7	8.1 / 92.6	
	Styrofoam recycling	6.2	6.2 / 100	Turned into raw materials (material recycling); immersed in solvent to be turned into soil, and recycled as raw material
Metal scraps	Scraps generated in manufacturing processes	3287	3287 / 100	Recycled as metal materials
	Metals (including empty cans)	0.6	0.6 / 100	
Paper scraps	Used paper	7.6	7.6 / 100	Turned into raw materials for recycled paper
	Newspapers, magazines, and other papers	64.2	64.2 / 100	
	Cardboards	284.2	284.2 / 100	
Wood scraps	Packages and transportation pallets	64.8	64.8 / 100	
Glass and ceramic scraps	Empty bottles, glass, and ceramics	3.3	3.3 / 100	Crushed and turned into road construction materials
Other waste	Paper scraps and other waste	7.5	0.3 / 4.1	Incinerated
<b>Total</b>		<b>4338.1</b>	<b>4327.5 / 99.8</b>	

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