SANYO DENKI

# Environmental data book 2017

# Message from the Major Operating Officer

## A Member of Global Society

In December 2015, the Paris Agreement was adopted as a new framework to prevent global warming, and the agreement entered into force in November 2016. The agreement sets the target of limiting the rise in average global temperatures to two degrees (if possible 1.5 degrees) compared with before the Industrial Revolution. Worldwide movements to prevent global warming are expected to gain traction going forward. Protecting the global environment is essential in order for humankind and other life to remain on the planet.

Addressing this issue, we are taking steps to realize a sustainable recycling-oriented society, and we are expanding these initiatives on a global scale.

To contribute toward the realization of a sustainable recycling-oriented society, the SANYO DENKI Group is pursuing corporate activities based on its corporate philosophy to "help preserve the global environment and enhance humanity's prosperity." As a member of global society, we are called upon to fulfill our social responsibility, and we consider preservation of the global environment an important responsibility. Companies cannot continue to enjoy the trust of society if they do not continue with corporate activities that contribute to environmental preservation. One area of particular importance is product development. Efforts in this regard continue helping to preserve the global environment into the future.

The SANYO DENKI Group launched its eighth Medium-term Management Plan in April 2016. The plan covers a variety of measures, including initiatives to help preserve the environment. We are accelerating a host of efforts aimed at highly sophisticated product development to highly efficient system configuration and including the development of world-leading products, factory automation and managing information in real time.

The SANYO DENKI Group will focus on developing its business globally. Simultaneously, we will proactively undertake environmental preservation efforts. The SANYO DENKI Group aims to continue being respected as a global company, and one that is considered necessary. We ask our stakeholders for your understanding and support of our business activities and our environmental preservation efforts.

Senior Executive Operating Officer
Nobumasa Kodama

# Contents



**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 2016 (from April 1, 2016 through March 31, 2017, 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.

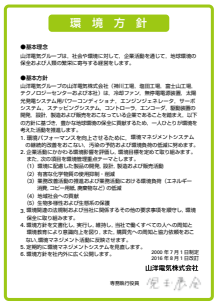
1. To enhance our environmental performance, we will continuously improve the environmental management system and work hard to prevent pollution and reduce the environmental impact of our activities.
2. We will assess the environmental impact of our corporate activities and focus on our environmental 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 17 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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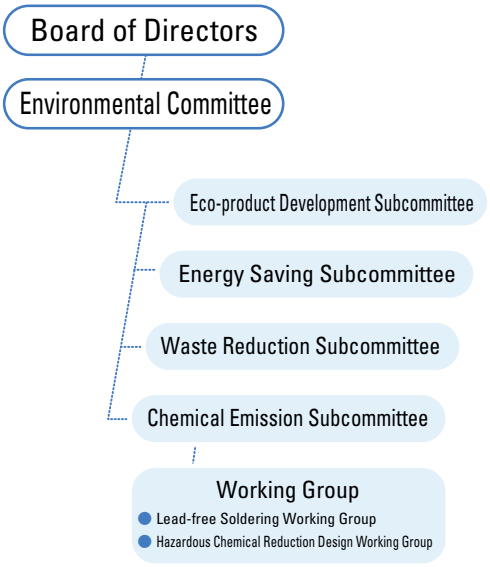
山洋電気株式会社

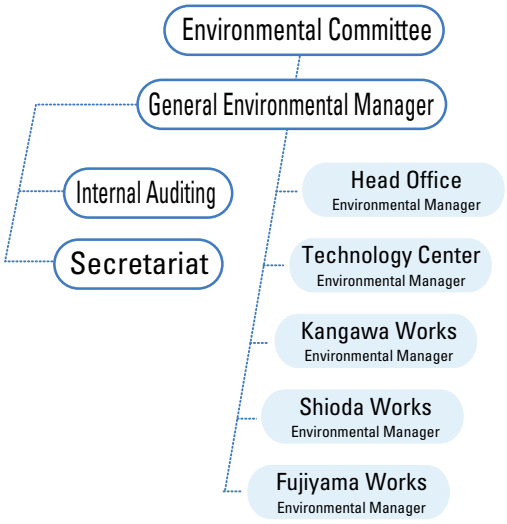
Environmental Policy Brochure

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 2016 | | Fiscal 2017 |
|---|---|---|---|---|
| | | Goal | Track record | Goal |
| Promotion of eco-design | | Creation of Eco-products | Eleven new products certified as Eco-products | Creation of Eco-products |
| Sales ratio of Eco-products (by business division) | Coolong Systems Division | 42% | 45% | 44% |
| | Power Systems Division | 42% | 36% | 45% |
| | Servo Systems Division | 34% | 35% | 36% |
| Reduction of hazardous chemical substances | | Use of lead-free soldering<br>Development of products with reduced amounts of RoHS-6 hazardous substances<br>Reduction of substances defined in the PRTR Law | Lead-free solder usage:nearly 100%<br>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<br>Implementation of measures to meet the RoHS & REACH standards<br>Reduction of PRTR-controlled substances |
| Reduction in power consumption | Kangawa Works | 6% | 12% | Reduction by 11% compared to fiscal 2006 |
| | Shioda Works | 79% | 79% | |
| | Fujiyama Works | 7% | 9% | |
| | Technology Center | (8%) | 2% | |
| | Head Office | 15% | 21% | |
| Reduction in fuel consumption | A-type heavy oil<br>*Total of the Shioda and Fujiyama Works | 255kl 23% | 244kl 26% | Consumption of LPG (Technology Center)<br>Maintaining it at the current level (reduced by 52% compared to fiscal 2000)<br>Consumption of LPG (Fujiyama Works)<br>Maintain at the fiscal 2013 level<br>Consumption of A-type heavy oil<br>Maintaining it at the current level (reduced by 21% compared to fiscal 2000)<br>Consumption of town gas<br>Reduction by 10% compared to fiscal 2010 |
| | LPG<br>*Total of the the Technology Center | 49,000m$^3$N 41% | 37,200m$^3$N 55% | |
| | Town gas<br>* Total of the the Kangawa Works | 748,000m$^3$N (5%) | 760,200m$^3$N (7%) | |
| | LPG<br>*Total of the Fujiyama Works | 33,000m$^3$N (22%) | 37,700m$^3$N (40%) | |
| Reduction in the use of copy paper | Kangawa Works | (43%) | (29%) | Maintaining it at the current level (reduced by 15% compared to fiscal 2000) |
| | Shioda Works | 80% | 87% | |
| | Fujiyama Works | (10%) | (0%) | |
| | Technology Center | 10% | 28% | |
| | Head Office | 39% | 47% | |
| Reduction of waste | Kangawa Works | (9%) | 1% | Maintaining it at the current level (reduced by 0% compared to fiscal 2000) |
| | Shioda Works | 71% | 79% | |
| | Fujiyama Works | 57% | 47% | |
| | Technology Center | 34% | 32% | |
| | Head Office | 67% | 68% | |
| 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<br>Participation in environment-related events |
| Promotion of zero emission | Company-wide waste recycling rate | 99.6% or higher | 99.8% | 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

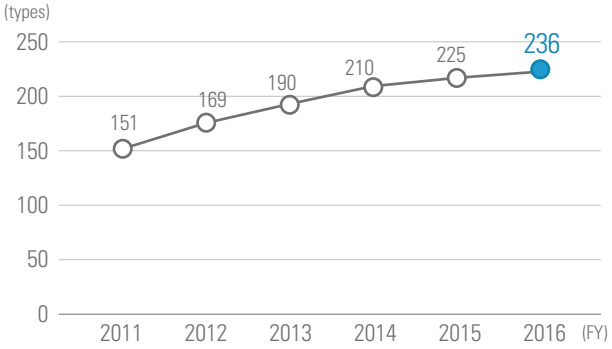
## Eco-products

### 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 11 eco-design products (Eco-products) in fiscal 2016. We will continue to promote the LCA-based development of products designed to reduce $CO_2$ emitted during their use and to be eco-friendly.

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

236 types



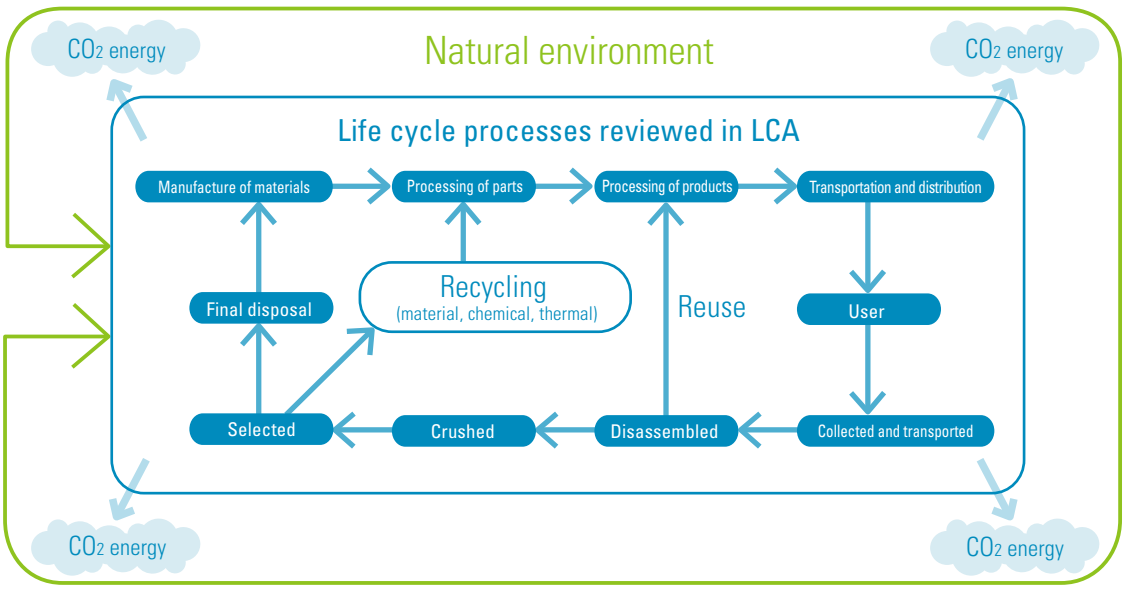

### Life cycle assessment (LCA)

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 Ecoproducts was 90% in fiscal 2016.

ECO PRODUCTS

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 $CO_2$ emissions.

# Product Development

## Eco-products of Fiscal 2016

### Results of LCA

Eleven new Eco-products were developed in fiscal 2016. The results are based on a comparison of the amounts of $CO_2$ 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 $CO_2$ emitted during the time of use will be effective in preventing global warming.


**92 × 92 × 76 mm Counter Rotating Fan**
***San Ace 92*** **9CRA type**

$CO_2$ emissions
**28%↘**

Power consumption
**20%↘**

**Models used for LCA comparison**
New model：9CRA0912P0G001
Conventional model：9HV0912P1G001

# Energy Saving

### Specific Energy-Saving Measures

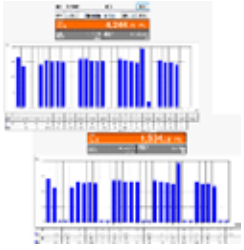
As a countermeasure against global warming, we consider the restriction of $CO_2$ emissions through energy-saving activities as our top-priority task, and are promoting the improvement of energy use efficiency and energy saving activities. Compared with the preceding fiscal year, in fiscal 2016 higher production volumes led to a increase in power consumption, and $CO_2$ emissions increased. These amounts were up slightly per unit of production.

### Results of Introduction

- Reduce the amount of electricity used for lighting by converting Technology Center lighting to LEDs and optimizing illumination levels.
- Reduce the amount of electricity required for holding pressure and standby times by selecting and introducing energy-saving hydraulic units on new production equipment.
- Expand the functionality of the Fujiyama Works' central monitoring system and install new electricity monitoring equipment at the Kangawa Works to make electricity consumption visible and eliminate waste.

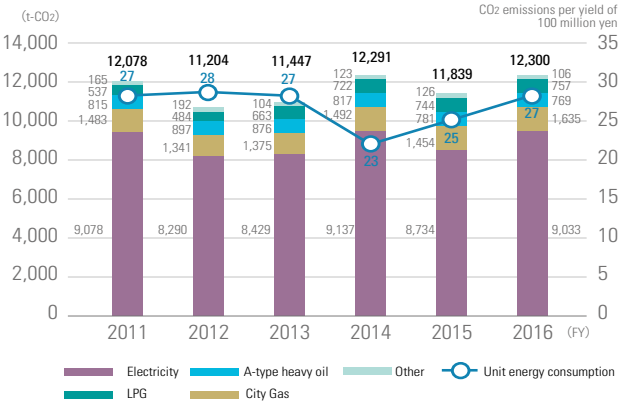

LED lighting


Hydraulic units

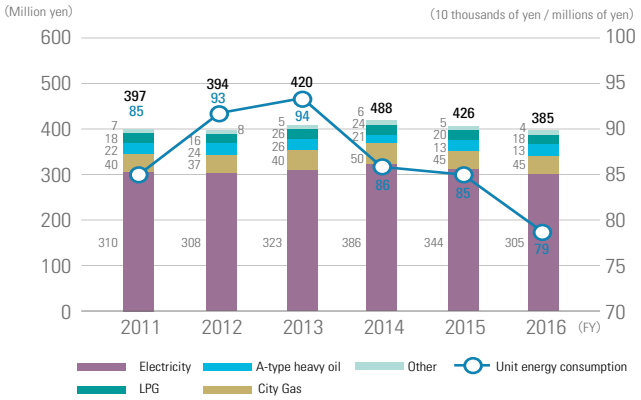

Electricity monitoring system

# Energy Saving

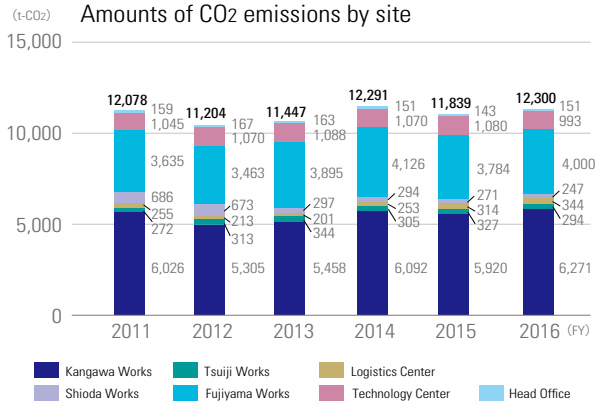
## Energy consumption measured in terms of the amount of $CO_2$



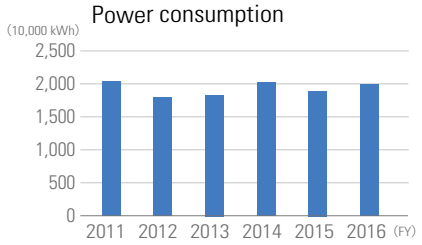

## Consumption value per production value



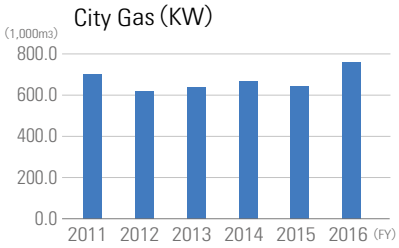

## Amounts of $CO_2$ emissions by site



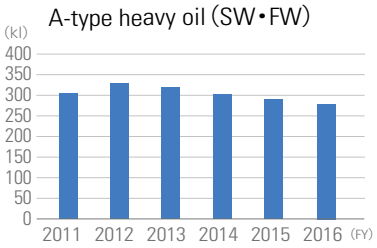

## Power consumption



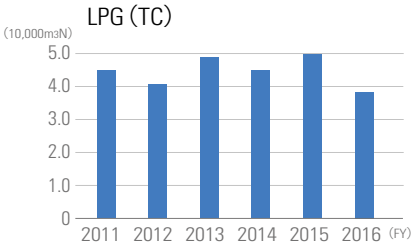

## City Gas (KW)



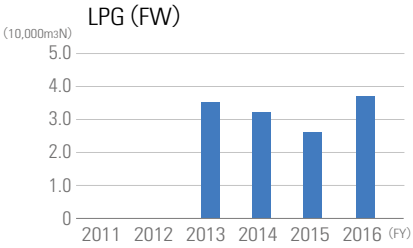

## A-type heavy oil (SW・FW)




## LPG (TC)




## LPG (FW)



# Energy Saving

Energy Saving Measures Implemented in Manufacturing Processes at Factories

| Works | Measures | Effects |
|---|---|---|
| Kangawa Works | (1) Cutting down on unnecessary lighting in warehouses and on equipment<br>(2) Promoting electricity savings when equipment is in standby status<br>(3) Promoting the use of solar power<br>(4) Lower air-pressure setting, repairing air leaks | (1) Saving electricity by limiting the amount of lighting<br>(2) Reduction in commercial electricity by powering equipment down to power saving mode when materials are out or when equipment is not in use<br>(3) Savings in commercial power use<br>(4) Electricity savings by reducing the burden on air compressors |
| Shioda Works | (1) Affixing calendar timers to machines<br>(2) Promotion of new equipment compatibility and automation at production facilities<br>(3) Systematic operation of boilers according to weekly calendar timers | (1) Savings in electricity by preventing switches from being left on<br>(2) Savings in electricity by reducing production cycle time, putting inspection data on line to eliminate the need for forms<br>(3) Control of the use of A-type heavy oil |
| Fujiyama Works | (1) Adjusting the operating hours of air conditioners<br>(2) Shifting the operating hours of production equipment<br>(3) Adjusting the operating hours of loading equipment for tests<br>(4) Promoting the use of solar power | (1) Energy savings through reduced operating hours and reduced the use of heavy oil A.<br>(2) Savings in commercial power<br>(3) Savings in electricity by reviewing the test run time<br>(4) Savings in commercial power |

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 2016, SANYO DENKI set out to achieve a waste recycling ratio of 99.6% as part of its recycling initiatives. 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

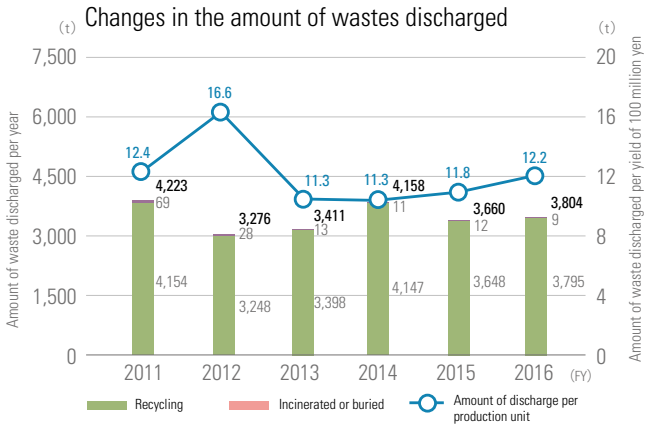
We promote in-house recycling of unneeded supplies such as OA equipment, desks, shelves and chairs.

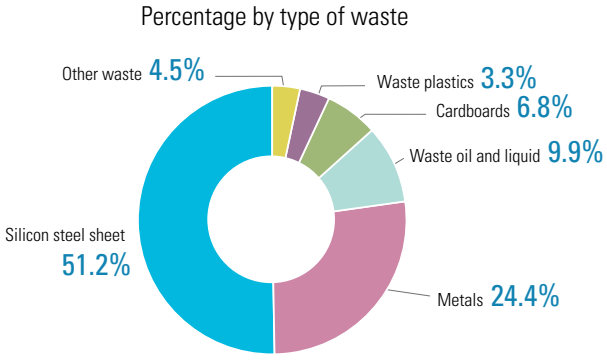
## Reuse of Materials

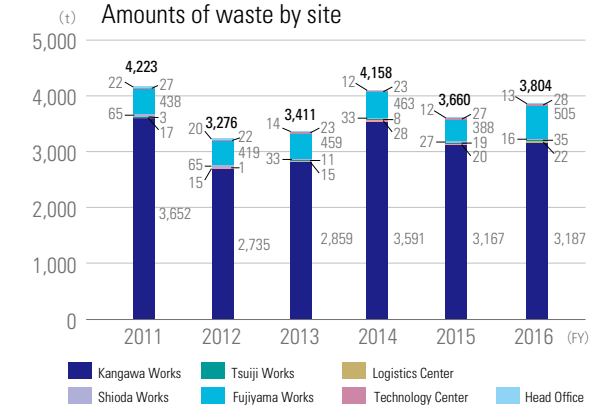
We return the wooden and plastic pallets used to transport purchased parts and materials to companies transporting them and reuse such pallets among our bases and cooperating companies. We also crush wooden pallets into chips, which are used for mulch at greenery around our sites.

**[Other examples of reuse of materials]**
Cardboard boxes: returned to suppliers
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 (high-concern material) in REACH, substances banned by domestic and foreign legislation, and substances designated by the Japan Green Procurement Survey Standardization Initiative (former JGPSSI). We keep these guidelines up-to-date by making necessary revisions in response to changes in relevant laws and regulations (last updated in March 2017). 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)
- 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.
- Our company guidelines concerning China RoHS and countermeasures for substances banned by the revised RoHS directive and REACH have been disseminated inside our company.
- 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: 173 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.
- We are responding 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])
- China RoHS directive: Implemented by the Chinese government, this law bans the use of specified hazardous substances in electrical and electronic products.
- 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 2016, 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 10 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 | 13.0t |
| Triphenyl phosphate | Fujiyama Works | 3.3t |
| Methylnaphthalene | Fujiyama Works | 2.8t |
| Antimony and its compounds | Fujiyama Works | 2.5t |

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 2016

(1) Environmental Conservation Costs

Environmental Conservation Costs in fiscal 2016 were 1,385 million yen in total: 315 million yen for investment and 1,070 million yen for costs and expenses. Investments include costs to preserve the global environment, such as converting the Technology Center to LED lighting and upgrading the central monitoring system at Fujiyama Works. In addition, we are working to develop eco-friendly products, and this investment is included in R&D costs. As for costs and expenses, R&D costs and management activities costs posted the high rates of 58.4% and 25.3%, 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 A-type heavy oil consumption and light oil consumption. In particular, the introduction of the energy has increased $CO_2$ emissions by 432 tons, and electric power consumption by 660 thousands kWh, as compared with the previous fiscal year.

(3) Economic Effects

Site production volume increased, but cost savings due to energy conservation grew approximately 34% year on year, to ¥41 million. Meanwhile, profits from sales of useful materials were 61 million yen, up about 15% from the previous year.

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

Data range (company-wide)

Period covered: April 1, 2016 to March 31, 2017

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)<br>Water pollution prevention (inspection of wastewater treatment tanks, extraction of sludge, sewage disposal, etc.) | 0 | 55,564 |
| | 2. Global environment conservation costs | Periodic electricity checks | 203,146 | 29,336 |
| | 3. Resource recycling costs | Reduction of waste, recycling, and proper waste disposal | 0 | 63,608 |
| | Total of items 1 through 3 | | 203,146 | 148,508 |
| (2) Upstream and downstream costs | | Green procurement of office supplies and commissions for refurbishing and reconditioning products | 0 | 18,854 |
| (3) Administration costs | | Development and operation of EMS and environmental training for employees | 0 | 271,060 |
| (4) R&D costs | | Development of Eco-products (such as testing equipment and molds) | 112,315 | 625,343 |
| (5) Social activity costs | | Annual membership fee for the Japan Environmental Management Association for Industry, and other fees | 0 | 6,254 |
| (6) Environmental damage measure costs | | Assessment of soil contamination, and costs for countermeasures | 0 | 0 |
| Total | | | 315,461 | 1,070,019 |

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 (Note) |
| Effects on resources input for business activities | Input of energy | Decrease in energy consumption | Energy consumption measured in terms of the amount of $CO_2$: 432 t-$CO_2$ |
| | | | Electricity consumption: 660,000 kWh |
| | | | A-type heavy oil consumption:4.7 kL |
| | | | LPG consumption: △ 3.7 t |
| | | | Kerosene consumption: 0.05 kL |
| | | | Light oil consumption: △ 8.7 kL |
| | | | Town gas consumption: 83,000 $Nm^3$ |
| | | | Gasoline consumption: 1.0 kL |
| | | Increase in the percentage of renewable energy in total energy consumption | Photovoltaic power generation: △ 0.06% (company-wide) |
| | Input of water | Decrease in water consumption | Water consumption: △ 3,500 $m^3$ |
| | Input of other resources | Decrease in the input of other resources | Copy paper consumption: 310,000 heets |
| 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: △ 144 t |
| | | Increase in the percentage of recyclable materials in the total discharge of waste | Recyclable materials and useful materials:0.092% |
| | | Decrease in the discharge of hazardous waste | Discharge of hazardous waste: △ 5.2 t |

△ : 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 | 60,534 |
| Reduction of costs | Reduction of costs by energy saving | 40,700 |
| | Reduction of waste disposal costs by recycling | △ 4,061 |
| | Reduction of expenses for copy paper | 2,566 |

△ : 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 2017.

## Head Office　Satoshi Hashiguchi

Location : 3-33-1 Minami-Otsuka, Toshima-ku, Tokyo
Area : 3,378 $m^2$
Number of employees : 267
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
- Appropriately managing heating and cooling temperatures and reducing the amount of electricity used
- Separating and reducing trash
- Increasing the recycling rate
- 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 $m^2$
Number of employees : 317
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 11 new items as Eco-products in fiscal 2016.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. In fiscal 2016, we converted all lighting to LEDs in an effort to reduce electricity use. 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.

The number of employees is as of March 2017.

## Kangawa Works　Kazuhiko Takizawa


Location : Ueda Research Park, 812-3 Shimonogo, Ueda-shi, Nagano
Area : 67,140 $m^2$
Number of employees : 420
ISO certificate obtained : March 2010
Major products : AC / DC servo motors, stepping motors, and linear servo motors

The Kangawa Works is working on process improvements for energy savings, such as 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.
We have also been engaged in the large-scale cleaning of the surrounding area in cooperation with the neighborhood community association. We will be 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 $m^2$
Number of employees : 12
ISO certificate obtained : March 2001
Major products : power conditioners for photovoltaic power generation systems

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 reduction in the operation time of production lines by improving the operation rate)
- Reduction in the consumption of A-type heavy oil (planned operation of boilers using timers)
- Reduction in the consumption of copy paper (moving inspection data on line to eliminate the need for forms)
- Thorough sorting of waste materials and promotion of the reuse of the delivery boxes for purchased parts
- 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 $m^2$
Number of employees : 374
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, energy saving and waste reduction and zero emissions through improvements of their operations. In fiscal 2017, 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<br>Air pollution control laws and ordinances | Smoke and soot ($g/m^3N$) | Exempted<br>(No applicable facilities) | | |
| | Nox (ppm) | | | |
| | Sox ($m^3N/h$) | | | |
| Water quality<br>Water pollution control laws, ordinance and agreements | PH (pH) | 5.8 ～ 8.6 | — | 7.7 |
| | BOD (mg/L) | 20 | 19 | 18.0 |
| | SS (mg/L) | 30 | 28 | 16.0 |
| Noise<br>Laws, ordinances and agreements for noise regulation | (dB) | 65 | 64 | 58 |

| Shioda Works | Item | Regulatory standard | Voluntary standard | Actual value |
|---|---|---|---|---|
| Air quality<br>Air pollution control laws and ordinances | Smoke and soot ($g/m^3N$) | 0.3 | 0.03 | 0.0015 |
| | Nox (ppm) | 180 | 130 | 88 |
| | Sox ($m^3N/h$) | 1.4 | 0.7 | 0.016 |
| Water quality<br>Water pollution control laws, ordinance and agreements | PH (pH) | Exempted<br>(No water disposal tank) | | |
| | BOD (mg/L) | | | |
| | SS (mg/L) | | | |
| Noise<br>Laws, ordinances and agreements for noise regulation | (dB) | 65 | 64 | 45 |

| Technology Center | Item | Regulatory standard | Voluntary standard | Actual value |
|---|---|---|---|---|
| Air quality<br>Air pollution control laws and ordinances | Smoke and soot ($g/m^3N$) | Exempted | | |
| | Nox (ppm) | 150 | 130 | 81 |
| | Sox ($m^3N/h$) | Exempted | | |
| Water quality<br>Water pollution control laws, ordinance and agreements | PH (pH) | 5.8 ～ 8.6 | — | 7.6 |
| | BOD (mg/L) | 20 | 19 | 10.0 |
| | SS (mg/L) | 60 | 54 | 11.0 |
| Noise<br>Laws, ordinances and agreements for noise regulation | (dB) | Exempted | | |

| Fujiyama Works | Item | Regulatory standard | Voluntary standard | Actual value |
|---|---|---|---|---|
| Air quality<br>Air pollution control laws and ordinances | Smoke and soot ($g/m^3N$) | 0.3 | 0.03 | 0.0042 |
| | Nox (ppm) | 180 | 130 | 68 |
| | Sox ($m^3N/h$) | 5.0 | 2.5 | 0.062 |
| Water quality<br>Water pollution control laws, ordinance and agreements | PH (pH) | 5.8 ～ 8.6 | — | 7.5 |
| | BOD (mg/L) | 50 | 48 | 17.0 |
| | SS (mg/L) | 60 | 54 | 26.0 |
| Noise<br>Laws, ordinances and agreements for noise regulation | (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 | 15.0 | 13.8/92.2 | 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 | 2.5 | 2.5/100 | After oil and water are separated, the materi al is recycled as fuel. |
| | Water-soluble materials (detergents, grinding liquid, etc.) | 243.6 | 243.6/100 | Reuse and incinerated residues are used as cement materials. |
| | Volatile materials | 10.4 | 10.4/100 | Distilled and used as recycled oil. |
| | Waste acid (batteries) | 62.3 | 65.3 /100 | Crushed, sorted, and all recycled. |
| Waste plastics | OA equipment and circuit boards | 21.4 | 21.4/100 | Crushed, sorted, and all recycled. |
| | Vinyls and films | 58.0 | 58.0 /100 | Turned into solid fuel (refuse derived fuel), reducing agents (using furnaces), and materials for power generation (thermal recycling) |
| | Molding scraps | 30.8 | 30.8/100 | |
| | Other solid scraps | 6.1 | 5.4/88.6 | |
| | Styrofoamrecycling | 8.8 | 8.8/100 | 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 | 2877.9 | 2877.9/100 | Recycled as metal materials |
| | Metals (including empty cans) | 0.3 | 0.3/100 | |
| Paper scraps | Used paper | 7.0 | 7.0/100 | Turned into raw materials for recycled paper |
| | Newspapers, magazines, and other papers | 53.9 | 53.9/100 | |
| | Cardboards | 256.8 | 256.8/100 | |
| Wood scraps | Packages and transportation pallets | 75.2 | 75.2/100 | |
| Glass and ceramic scraps | Empty bottles, glass, and ceramics | 2.3 | 2.3 /100 | Crushed and turned into road construction materials |
| Other waste | Paper scraps and other waste | 7.5 | 0.4/4.9 | Incinerated |
| Total | | 3804.7 | 3795.7/99.8 | |

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