Initiatives for Environment

Environmental Management

Furukawa Electric Group Basic Environmental Policy

Basic Philosophy

We, the employees of the Furukawa Electric Group, recognize that conservation of the global environment is a serious issue confronting the international community, and we pledge to contribute to a sustainable future for the world through technological innovation that utilizes our strength in advanced materials.

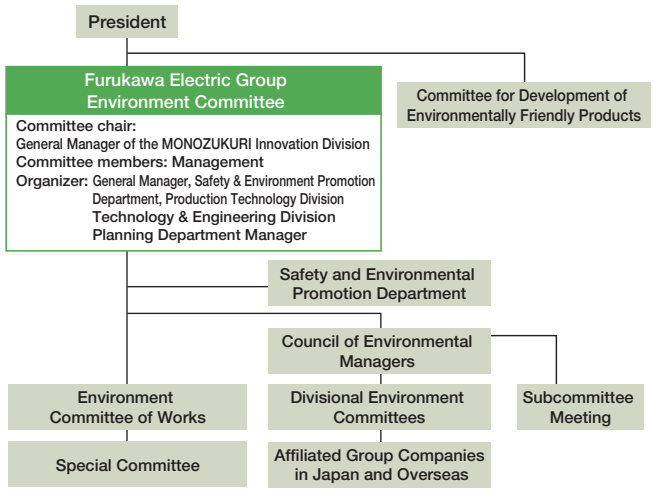
Action Guidelines

1. We shall comply with environmental laws and regulations as well as the demands of our customers and others, setting ever higher environmental targets as we continuously improve our global environmental conservation efforts.
2. We shall strive to develop products that are friendly to the Earth, and create new environmental businesses.
3. We shall strive to reduce environmental risk by incorporating anti-climate change and resource conservation/recycling considerations, as well as a reduction in the use of environmental impact-causing substances, across the entire product lifecycle.
4. We shall evaluate the ecological impact of all of our businesses, and strive for the conservation of biodiversity and sustainable use of resources.
5. We will seek harmony with the natural environment and local communities through dialogue with our stakeholders.

Environmental Management Organization

In April 2013, we underwent organizational restructuring, transitioning to a strategic business unit system. We also renamed our highest-level advisory body related to environmental management the Furukawa Electric Group Environment Committee and promoted environmental management under a new structure. The “Council of Environmental Managers” was set up under the Committee in order to promote the smooth development of environmental management decision-making, and a variety of special committees were consolidated and merged.

Promotion Framework



Environmental Education

Environmental Education System and Environmental Education Programs

Furukawa Electric Group is engaged in a variety of environmental education activities in order to raise environmental awareness among its employees and help them to gain information necessary to conduct the environmental activities of the Group.

From fiscal 2016, we have been proceeding to train ISO14001: 2015 internal environmental auditors, ahead of the deadlines related to the ISO14001: 2015 version revisions. 51 employees undertook classes for newly-appointed ISO14001 internal environmental auditors, and 88 employees including those from Group companies took lecture courses at our Head Office for principal internal environmental auditors at each location, to inform qualified staff of the differences between revisions. Also, in order to cover the scope of Furukawa Electric in its entirety, a total of 139 internal environmental auditors from individual bases, including 37 from the Mie Works, 22 from the Copper Tube Division, 45 from the Hiratsuka Works, and 35 from the Copper Foil Division participated in training courses.

Environmental activity award system

From fiscal 2010, Furukawa Electric presented environmental activities awards in the following three fields with the aims of improving environmental awareness and

raising the level of environmental activities: “sales promotion activities for environmentally friendly products”; “global warming prevention activities”; and “Group activities”. However, the award system was combined into a single category in fiscal 2014 under the “environmental contribution awards”. Furthermore, in order to promote the horizontal development of environmental initiatives, a presentation meeting is held once a year to showcase outstanding examples of environmental activities. An energy conservation project conducted by the Copper Foil Division was selected to receive first prize in fiscal 2016.

Environmental Accounting

Furukawa Electric Group has introduced environmental accounting and works hard to promote efficient and effective environmental activities through the quantitative identification of environmental conservation costs and effects.

Collation is implemented in reference to the Ministry of the Environment’s “Environmental Accounting Guidelines 2005” and covers Furukawa Electric Co., Ltd. and 21 domestic group companies.

The costs of environmental conservation activities in fiscal 2016 were 2.88 billion yen in expenses and 1.0 billion yen in investments. This represents a 0.18 billion yen fall in expenses and a 0.02 billion yen increase in investments against the previous fiscal year. Energy costs fell by 1.51 billion yen as a result of consolidating our manufacturing bases through reforms of the business structure.

Please see P.61 for details of the companies included in the scope of data collation. Please see below for the collated results of environmental accounting.

CSR
WEB http://www.furukawa.co.jp/en/csr/

Environmental education programs

Category of educational training	Content	New recruits	General employees	Mid-career employees	Newly appointed section managers	Management
Education for new recruits (once a year, mandatory)	General environmental conservation activities	Training for new recruits				
EMS activities (as needed, mandatory)	Environmental Policy and purpose, goals and general knowledge pertaining to the environment	←	—	—	—	→
ISO14001-related education (two-day course)(twice a year, voluntary)	Requirements of ISO standards, environment regulations, procedures for internal environment audits, various drills		←	—	—	→
One-day brushup course (once a year, voluntary)	Trends in environmental regulations, various drills to brush up auditing skills		←	—	→	
Environmental subjects (as needed, voluntary)	Environmentally considerate design		←	—	→	
	Environmental regulations		←	—	—	→
	Control of chemical substances contained in products		←	—	—	→
Consolidated environmental management seminars	Seminars by experts on priority issues					↔

Message from the General Managers

We are steadily advancing our Group Global environmental activities.

Tsutomu Fujinuma

General Manager, Safety & Environment Promotion Department, MONOZUKURI Innovation Division

Furukawa Nikko Power Generation Inc., a member of our Group, is carrying out hydroelectric power generation with the resulting clean energy being used for the manufacture of copper products at our Nikko Works. In addition, we have operated recycling businesses since the 1970s, with Furukawa Electric Ecotec Co., Ltd. engaged in total recycling of electric wires and cables, including collection, decomposition, and reclamation. Although our Group has carried out product manufacturing and recycling businesses while taking great consideration for the natural environment for some time, in recent years we have been expanding beyond only considering the CO_2 emissions produced by our Group and are proceeding with the visualization of CO_2 emissions at all product life cycle stages, including the reduction of CO_2 which is emitted when our products are at the stage of being used. In the future, we will expand our Group Global environmental activities and advance our environmental initiatives together with our business colleagues around the world. We will also take the lead in product development that can contribute to environmental conservation as well as environment-friendly manufacturing, continuing our dedicated efforts to gain the trust of our stakeholders.

Material Flow

Environmental Impact of the Furukawa Electric Group in Fiscal 2016

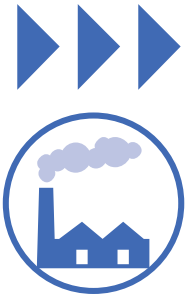
We tallied data for Furukawa Electric, 33 Group companies in Japan, and 54 Group companies overseas—a total of 88 companies.

Please refer to page 61 for a list of all applicable companies.

INPUT

Category	Domestic	Overseas	Unit
Raw materials			
Copper	168.5	167.6	1000t
Aluminum	7.0	30.0	1000t
Iron	2.5	11.4	1000t
Other metals	4.8	1.1	1000t
Glass	–	3.4	1000t
Plastic	32.7	40.5	1000t
Energy	**7,449**	**8,020**	TJ
Electricity (purchased electricity)	513.8	703.9	GWh
Electricity (hydroelectric electricity)	105.1	–	GWh
Electricity (solar electricity)	14	–	MWh
City gas	5,815	5,048	1000 m^3
LPG	18.1	3.6	1000 t
Heavy fuel oil A + Kerosene + Light oil	5,652	903	kl
Water	**10,289**	**2,611**	1000 m^3
Industrial water	7,159	58	1000 m^3
Groundwater	2,373	311	1000 m^3
Tap water	756	2,242	1000 m^3
Chemical substances			
Volume handled (note 1)	46.4	–	1000t
Packaging (note 2)			
Cardboard + Wood + Paper	3.5	6.6	1000t
Plastic	0.11	0.37	1000t

Furukawa Electric
7 works,
33 Group companies
in Japan
and
54 Group companies
overseas



OUTPUT

Category	Domestic	Overseas	Unit
Waste (note 3)			
Total waste generated (note 4)	32.0	18.0	1000t
Final waste disposal	0.3	9.2	1000t
Recycling amount	30.5	5.2	1000t
Atmospheric emissions			
CO_2	357	434	1000t-CO_2
SOx	15	–	t
NOx	55	–	t
Soot	6	–	t
Chemical substances			
Volume emitted	156	–	t
Volume transferred	277	–	t
Wastewater	**9,095**	**1,913**	1000 m^3
Public waterways	8,491	379	1000 m^3
Rivers	7,684	105	1000 m^3
Sea	787	0	1000 m^3
Other	20	274	1000 m^3
Sewer	604	1,534	1000 m^3
BOD	36	–	t
COD	40	–	t
SS	25	–	t
Volume of water recycled and reused	**1,118**	**31,703**	1000 m^3

(note 1) PRTR-listed substances
(note 2) Cardboard, wood, paper, and plastic used in product shipping
(note 3) Including valuable resources (Japan)
(note 4) Emissions off-site

Targets and Performance of Environmental Conservation Activities

Achieved Partially achieved Not achieved

Activity		Base year	Furukawa Electric Group (Domestic and overseas groups)			
			Targets for fiscal 2016	Fiscal 2016 results	Evaluation	Target for fiscal 2017
Waste	Total generated amount of waste materials per sales	2015	Domestic: 1% reduction	6.8% reduction	☺	Domestic: At least 2% reduction
	Zero emission rate		Domestic: 0.3% or less	0.04% (achieved)	☺	Domestic: 0.3% or less
Efficient utilization of water	Water use per sales	2015	Domestic and overseas: 1% reduction	Domestic: 4.1% reduction Overseas: 1.0% reduction	☺	Domestic and overseas: At least 2% reduction
Prevention of global warming	Greenhouse gas emissions	2013	Domestic: 3% reduction	17.5% reduction	☺	GHG emissions (Scope1, 2) (note 1) - Domestic: At least 4% reduction - Overseas: At least 2% reduction per sales GHG emissions (Scope3) (note 1) - Set target by fiscal 2018
		2015	Overseas: 1% reduction per sales	1.2% increase	☹	
	Production energy per sales	2013	Domestic: 6% reduction	10.7% reduction	☺	Domestic: At least 8% reduction
		2015	Overseas: 1% reduction	0.2% reduction	☹	Overseas: At least 2% reduction
	Transportation energy per ton-kilometers	2015	Domestic: 1% reduction	4.6% reduction	☺	Domestic: At least 2% reduction
	Energy consumption per floor area in office	2015	Domestic: 1% reduction	0.6% increase	☹	Domestic: At least 2% reduction
Environmentally friendly design			Sales ratio of environmentally friendly products: 35% or more	30.5%	☹	35% or more
			Contribution of products avoided CO_2 emissions: 60,000 ton-CO_2 or more	64,000 tons	☺	70,000 ton-CO_2 or more
CDP(note 2) score up (climate change)			—	—	—	Score B or more
Prevention of environmental accidents			Number of accidents: Zero Number of small accidents: 3 or less	accidents 2 small accidents 3	☹	Number of accidents: Zero Number of small accidents: 3 or less

(note 1) GHG*, Scopes 1, 2, and 3
*GHG: Greenhouse Gas
Scope 1: Direct emissions from offices caused by the use of fossil fuels, etc.
Scope 2: Indirect emissions from outside offices caused by the use of electricity, steam and heat
Scope 3: As other emissions, Indirect emissions from purchased product services, business trips, commuting, and upstream shipping, etc.
(note 2) CDP: CDP is an organization formed from institutional investors for the purpose of managing a project requiring companies to disclose their strategies for climate change and the specific amount of greenhouse gases they generate.

Activities Targets and Performance in Fiscal 2016

Furukawa Electric Group sets out environmental conservation activities targets for each fiscal year in accordance with the three-yearly mid-term environmental targets. In fiscal 2016, we carried out initiatives to achieve our targets as the first year in a new three-year plan.

Our activities to prevent global warming included integrating and consolidating the manufacturing bases of various products through business structure reform, achieving a 1.2% reduction in CO_2 emissions for our domestic and overseas Groups compared to fiscal 2015.

Activity Targets in Fiscal 2017

In fiscal 2017, the second year of our three-year medium-term environmental plan, we will thoroughly implement initiatives on a Group-wide basis to achieve our targets. We will aim to improve our CDP climate change score as a form of external evaluation, and will take action to reduce emissions of chlorofluorocarbon and other greenhouse gases through CO_2 reduction measures as part of our global warming prevention activities.

Midium and long term targets

Furukawa Electric Group has identified three “materialities” (greenhouse gas measures, effective use of resources, and conservation of biodiversity), and set medium to long-term targets by 2020. The medium to long-term target of our global warming prevention measures is for reductions of at least 50% in CO_2 emissions by 2050, in reference to IPCC AR5, and we are formulating specific medium to long-term reduction plans to reach this goal.

Environmentally Friendly Products

Environmentally Friendly Products and the e-Friendly Accreditation System

Furukawa Electric Group certifies and registers as environmentally friendly products those products with improved performance compared to existing products in the categories of materials and parts purchasing and manufacture, use, distribution and disposal.

The e-friendly mark

We have created the “e-Friendly” environmental mark to identify such environmentally friendly products. This mark is placed on those products.

Categories of Environmentally Friendly Products

The Group's environmentally friendly products belong to one of four categories described below.

Environmentally friendly product categories

Category	Content
Prevention of global warming	Products with functions that help in the reduction of emissions as well as the absorption and stabilizing of greenhouse gases.
Zero emission	Products made from recycled materials, products designed with easyto-recycle components, products made from materials or with design facilitating volume reduction for lowering waste volume, products designed to share common components with other products or products designed as common components.
Elimination of materials that have an impact on the environment	Products that do not lead to an increase in the use of ozone-depletive substances during the manufacturing process, do not contain harmful substances above regulatory limits and do not generate harmful substances above these limits during use or disposal.
Resource savings	Products that result in overall energy savings by such means as reducing the use of raw materials and components as well as scarce resources, featuring enhanced longevity, allowing easier product and component maintenance, and reducing the use for resources in packaging.

Expanding Environmentally Friendly Products

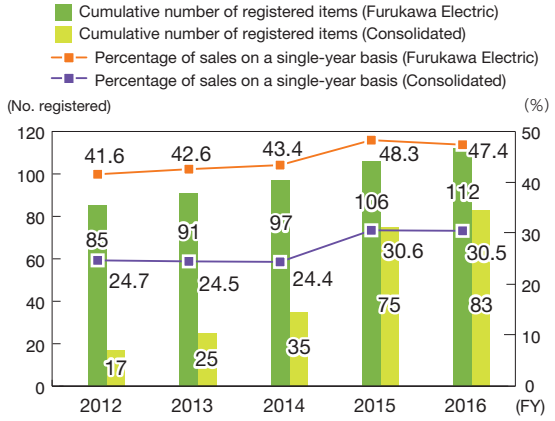
We are working to increase our overall percentage of environmentally friendly products. We set targets based on percentage of sales, and confirm our progress and success on this basis.

Environmental Performance Indicator “Visualization”

As part of its efforts to create (visualize) indices for environmental performance, Furukawa Electric Group has promoted “visualization” of CO_2 emissions by using life cycle assessments (LCA).

The results of these LCAs will be utilized in basic data and technical materials on CO_2 reduction when our products are at the stage of being used, in sales promotion pamphlets, and in research and development for the environmentally-friendly products of the future.

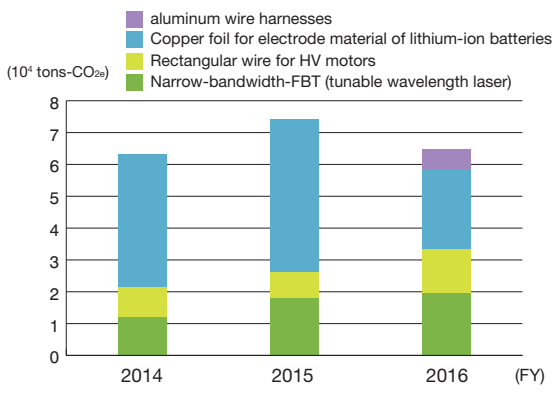
Environmentally friendly products as a percentage of sales



Initiatives to Reduce CO_2 Emissions from Products during Use

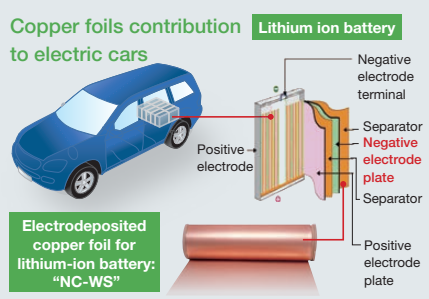
Based on its track record in environmental performance indexing, we are working to visualize the reduction of CO_2 which is emitted when our products are at the stage of being used. According to the estimate for fiscal 2016, there was a total reduction of roughly 64,000 tons-CO_2/year in the domestic market, with aluminum wire harnesses newly added to our mainstay products consisting of copper foil, rectangular magnet wire and semiconductor lasers. Going forward, we will try to expand sales of each product category and increase the number of contributing products, so that we can develop our activities to tackle environmental issues through our products.

Contribution of products avoided CO_2 emissions



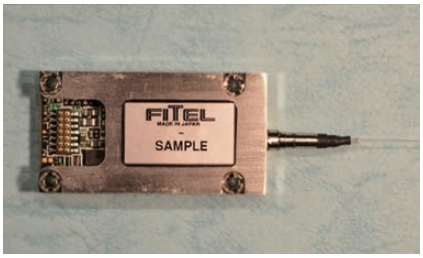
Reduction of CO_2 emissions through copper foil for electric car batteries

Copper foil for electrode material of lithium-ion batteries



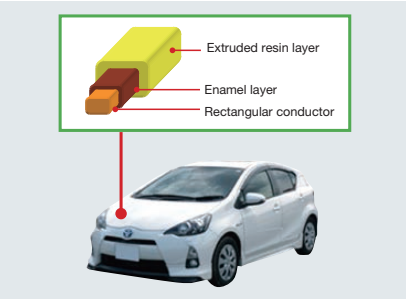
CO_2 reduction of semiconductor lasers

Narrow-bandwidth-FBT (tunable wavelength laser)

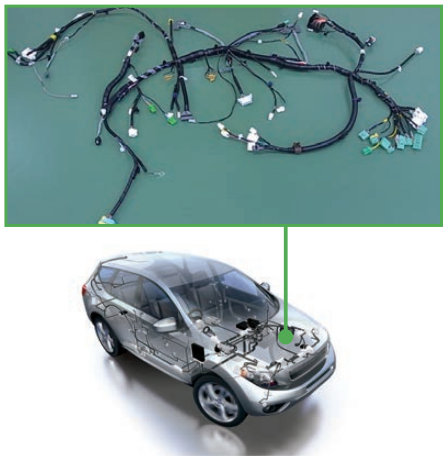


CO_2 reduction of enameled extruded rectangular wire

Rectangular wire for HV motors



CO_2 reduction of aluminum harnesses for automobiles



Preventing Global Warming

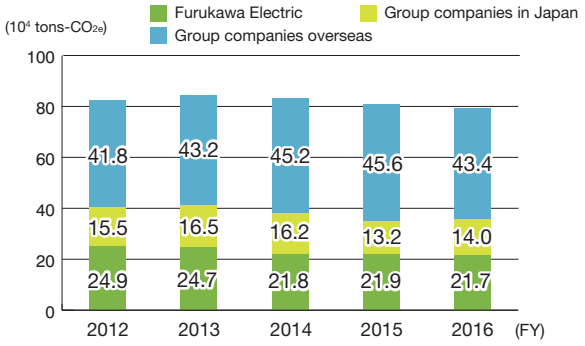
Reducing CO_2 Emissions

Measures at our factories

The main greenhouse gas emitted by Furukawa Electric Group is CO_2 that arises from the consumption of energy sources, such as electricity and fuel. In order to achieve emissions reductions particularly in our manufacturing processes, which account for a large percentage of our emissions, we have implemented energy-saving measures such as streamlining of the manufacturing process, switching fuels, upgrading to highly efficient equipment, and insulating high temperature parts of equipment.

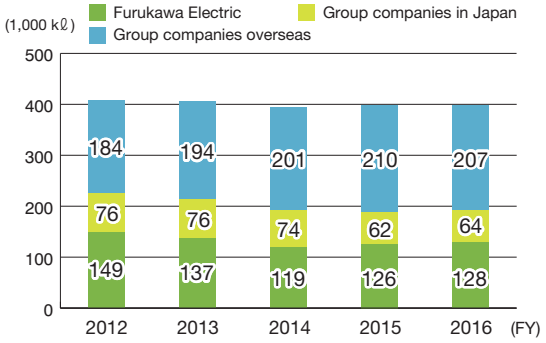
CO_2 emissions for the domestic Group in fiscal 2016 were 357,000 tons-CO_2/year. Although this was an increase of 1.7% against fiscal 2015, it was a reduction of 18.8% against fiscal 2000. CO_2 emissions for the overseas Group were 434,000 tons-CO_2/year, a reduction of 5.0% against fiscal 2015. We will continue to work hard as a group to promote activities that reduce emissions.

CO_2 emissions



(note) For the overseas CO_2 emission coefficient, the coefficient for each country according to the IEA (International Energy Agency) is used for purchased electricity, while the Japanese emission coefficient is used otherwise.

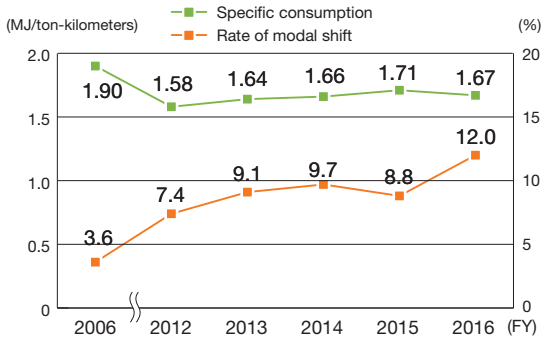
Energy consumption



Initiatives in Logistics

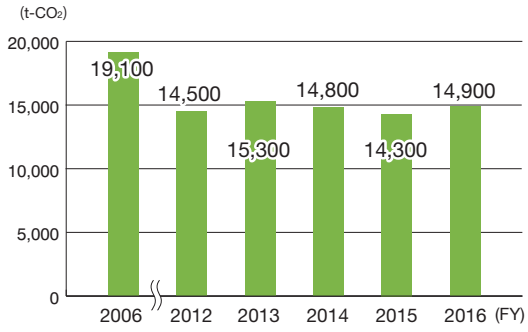
The entire Furukawa Electric Group transported 222,000,000 ton-kilometers during fiscal 2016 - an increase of 4.0% compared to fiscal 2015. Of this, Furukawa Electric itself transported 131,000,000 ton-kilometers, which was an increase of 7.5% from fiscal 2015, and our CO_2 emissions were 14,900 tons-CO_2, a rise of 4.2% compared to fiscal 2015. Specific consumption showed a 2.5% reduction against fiscal 2015. We will continue with initiatives to promote modal shift, increase loading rates and encourage joint shipping.

Modal shift (note 1) and specific consumption (note 2) (Furukawa Electric)



(note 1) Modal shift rate: percentage of total transportation using railways or shipping
(note 2) Base unit: Energy consumption per transportation unit (MJ/t-km)

CO_2 emissions related to transportation (Furukawa Electric)



Measures to disclose environmental information

Since fiscal 2008, Furukawa Electric Group has answered enquiries from CDP, representing our institutional investors, on climate change since fiscal 2008 and on water use since fiscal 2013. In fiscal 2016, our CDP climate change score was evaluated as B.

In order to support customers participating in CDP supply chain programs and to maintain and improve our CDP score, we will expand the scope of environmental data we release from here on and enhance our reliability. We will also participate in the Ministry of the Environment's environmental information disclosure infrastructure development project and will collaborate with The Japanese Electric Wire & Cable Makers' Association and the Japan Copper and Brass Association.

Greenhouse Gas Emissions in fiscal 2016 (1,000 t-CO_2e/year)

	FY2016
Scope 1 (direct emissions)	141
Scope 2 (indirect emissions)	649
Scope 3 (other)	2,041

Furukawa Electric Group has undergone verification by an independent third party to improve the reliability of our environmental data. In addition to Scope 1 and Scope 2, we have now added a portion of the categories for Scope 3 to our data.


DNV·GL

VERIFICATION STATEMENT OF GREENHOUSE GAS ASSERTIONS

Greenhouse Gas Inventory Report (2017)

The verification has been performed under the supervision of:

Akira Sekine
GHG Verifier
June 2017

Independent Validation Verification Body:
DNV GL Business Assurance Japan KK

Naoki Maeda
Management Representative
28 June 2017

Verification Statement of Greenhouse Gas Assertions

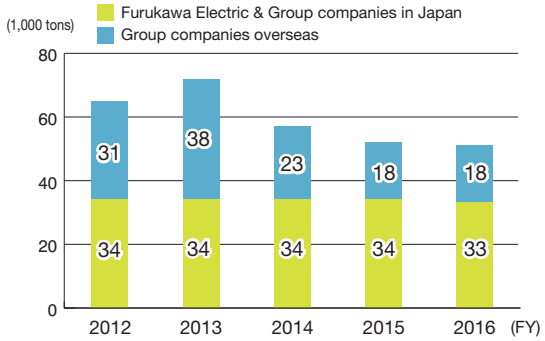
Reducing Waste

Waste Reduction Initiatives

In 1993 Furukawa Electric Group began its efforts to increase waste recycling, and since fiscal 2001 has continued its zero emissions activities with the goal of reducing total emissions of industrial waste disposed in landfills to less than 0.3% (the base value was cut in fiscal 2014 from 1% to 0.3%).

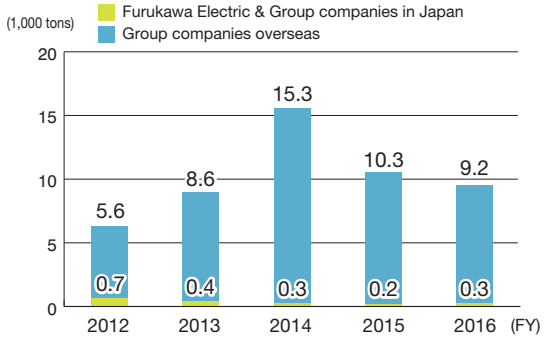
In fiscal 2014, we launched activities aimed at reducing our total waste output, including valuable resources. In fiscal 2016, we achieved a reduction of 6.8%, against a 1% reduction in output rate per unit of net sales compared to the Japanese Group target for fiscal 2015.

Total amount of waste matter generated



(note) Valuable resources are included in total waste generated for Japan only.

Direct landfill disposal

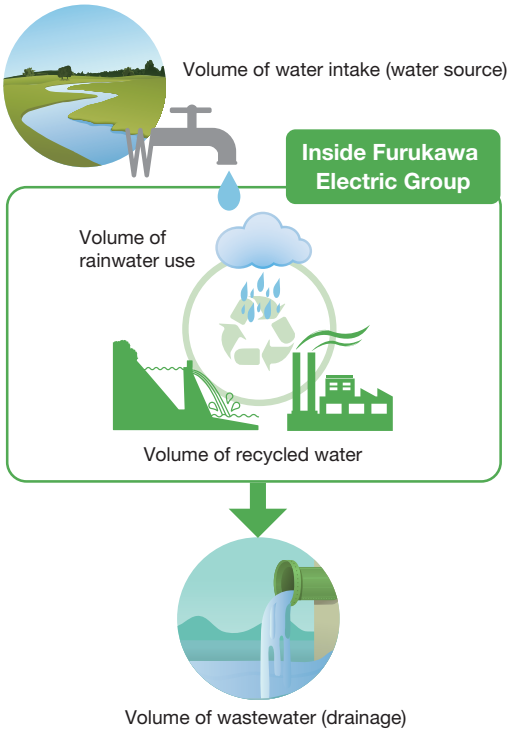


Water Resources

Effective Utilization of Water

Since fiscal 2013, Furukawa Electric Group has promoted effective water use as one of its activities targets, and identified water intake and wastewater at each base. Since fiscal 2015, we have taken action for reductions in base units versus net sales. In fiscal 2016, the water usage base unit by our domestic Group was 2,300 m^3 /100 million yen, a reduction of 4.1% from fiscal 2015. For our overseas Group, the water usage base unit was 1.0% lower than fiscal 2015. Furukawa Electric will continue working hard to save and recycle water, and to manage water quality, water usage, and wastewater volumes.

We have gained an understanding of water-related risks at our major bases, so that we can release information on water resource management for our CDP supply chain program. We will continue with risk management while promoting our Group's BCM activities.



Chemical Substance Management

Green Activities

Response to Customer Requests

Furukawa Electric Group has participated in JAMP (note 1) since 2009, and is implementing simultaneous environmental examinations based on the latest information from the JAMP management target substance list related to management of chemical substances contained in products. We also monitor trends in laws and regulations covering the chemical substances contained in products and compile and update data as it becomes available, allowing us to respond promptly to customer requests.

Response to overseas regulations and management of chemical substances contained in products

Furukawa Electric Group establishes a management system for chemical substances contained in products for major operational bases and affiliated companies, strengthens the environmental product regulations and grasps the environmental risk that should be lowered, and implements measures depending on their importance. In fiscal 2016, we conducted an environmental inspection on 173 substances, covering up to the 16th SVHC list of the EU REACH environmental product regulations. We are also making appropriate shifts to chemSHERPA (a scheme that facilitates sharing information on chemical substances in products) in order to meet customer demands.

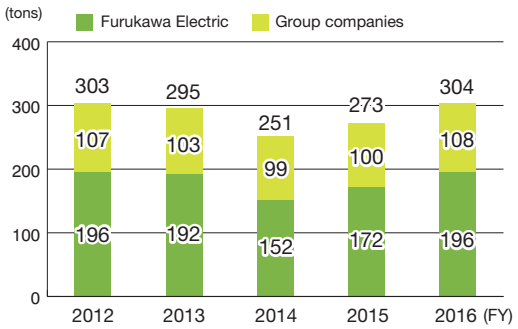
Green Procurement Activities

Items that will be used in our products are purchased adequately based on the Green Procurement Guidelines of our operational division, by evaluating the suppliers' system on the management of chemical substances contained in products and its management status as well as by confirming the data of chemical substances contained in products.

Chemical Substance Management Activities

Furukawa Electric Group undertakes voluntary initiatives to reduce emissions of harmful chemical substances. In particular, we make every effort to actively reduce emissions of volatile organic compounds (VOC), one cause of photochemical smog. The emission results for our domestic Group in fiscal 2016 were on the same level as those for fiscal 2012. We will continue to take action to suppress emissions in our production processes and other activities.

Emissions of volatile organic compounds (Group Companies in Japan)



(note) Volatile organic compounds are the 118 substances specified by The Japanese Electric Wire & Cable Makers' Association (January 2012 edition).

Appropriate Management of Chemical Substances

At Furukawa Electric Group, we confirm the properties and applicable laws and regulations regarding all chemical substances we use during the manufacturing process on their Safety Data Sheets (SDSs) and administrate them. We also monitor the usage volume of chemical substances listed in the PRTR Law (note 2).

(note 1) JAMP: Joint Article Management Promotion-consortium
(note 2) Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

Environmental Risk Management

Preventing Soil and Groundwater Pollution

Furukawa Electric Group conducts regular inspections of facilities and equipment that handle specific toxic substances to prevent the pollution of soil and groundwater. We reduce the risk of pollution through measures to prevent leaks of specific toxic substances and underground seepage, as well as through ongoing efforts to switch to substitute substances.

PCB Management

Furukawa Electric Group identifies the volume of high-concentration PCB-containing equipment at Furukawa Electric Co., Ltd.'s works and at the bases of our group companies, and carries out appropriate storage and management. We have been gradually disposing of this equipment in accordance with a plan set out by the

Japan Environmental Storage & Safety Corporation. We have carried out analysis and surveys of equipment that has the potential to contain low concentration PCB, and are proceeding with disposal of this equipment while taking consideration for storage-related risks. We will continue to dispose of such equipment in a systematic way.

Compliance with Environmental Laws and Other Regulations

Furukawa Electric Group regularly confirms environmental laws and other regulations to determine items requiring compliance. We ensure compliance in a number of ways, such as by conducting on-site patrols to check the state of compliance. We follow official journals and other sources of information to stay updated on revisions to environmental legislation and ensure that our response is thorough.

We maintain voluntary control limits and manage operations appropriately to ensure compliance with the Air Pollution Control Law and the Water Pollution Control Law.

In fiscal 2016, we carried out site inspections once again at five bases where environmental accidents or abnormal conditions occurred in the past. We will continue to carry out appropriate management of harmful chemical substances.

We also conduct annual checks for conceivable, clear environmental impact to prevent environmental accidents or prevent widespread impact in the event of an accident. According to our survey on the status of our regulatory compliance, we were not in material violation of any regulations.

Please see the URL below for our response to the asbestos problem, and a list of PRTR compatible materials.

CSR
WEB http://www.furukawa.co.jp/en/csr/risk/

Biodiversity Conservation

Biodiversity Conservation Initiatives

Furukawa Electric Group has included biodiversity conservation measures in our Basic Environment Policy. We have formulated and are applying Furukawa Electric Group comprehensive guidelines in relation to initiatives aimed at protecting biodiversity.

As we have registered with the JBIB (Japan Business Initiative for Biodiversity) and are working to deepen our understanding of it, our Group company Furukawa Research Inc. launched activities in fiscal 2015 to cultivate within the grounds of Furukawa Electric Co. Ltd.'s Yokohama Works the flower Pulsatilla cernua, which has been designated as an Endangered Species II (note 1), as part of efforts to contribute to regional society. Cultivation activities were also started at our Group's Hiratsuka Works and Chiba Works in fiscal 2016.

(note 1) Endangered Species II is a category of species for which the danger of extinction is becoming more serious.

Pulsatilla cernua in bloom at the Hiratsuka Works

Furukawa Electric Group Biodiversity Conservation Guidelines

1. Evaluate the effects that our business activities have on the ecosystem, and minimize the harmful effects while maximizing the beneficial ones
2. To sustainably use resources and conserve biodiversity, consider more than ever the need to carry out measures against climate change, conserve resources, recycle and reduce environmentally hazardous substances
3. Carry out activities in collaboration with local communities to conserve biodiversity