

**Renesas Electronics**

# **ENVIRONMENTAL REPORT 2016**

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## How to Use

Each page in this report contains navigation buttons and category tabs to make it easy to move from page to page.

**Category tab**  
Go to top page in each category.

**Link button**  
European RoHS initiatives  
<https://www.renesas.com/en-eu/support/products-common/lead/rohs.html>  
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## Editorial Policies

This Environmental Report is intended for the many stakeholders of the Renesas Electronics Group, including employees, customers, members of the local communities where we conduct business, suppliers, partners, shareholders and investors. With the objective of promoting two-way communication between the Company and these stakeholders, this report explains our approach to the environment and illustrates our specific activities in an easy-to-understand fashion.

## Guidelines Used

- Environmental Reporting Guidelines 2012 (Ministry of the Environment, Japan)
- Environmental Accounting Guidelines 2005 (Ministry of the Environment, Japan)
- ISO 26000: 2010 Guidance on Social Responsibility (Japanese Standards Association)

## Reporting Scope

The report covers the Renesas Electronics Group, which consists of Renesas Electronics Corporation, 5 domestic Group companies and 22 overseas Group companies.

In this Environmental Report, we use the fiscal year, which ends on the last day of March. Example:

Fiscal 2016 (From April 1, 2015 to March 31, 2016)

Fiscal 2017 (From April 1, 2016 to March 31, 2017)

## Reporting Period

This report primarily covers the period from April 1, 2015 to March 31, 2016, and includes reports on certain subsequent activities.

## Publication Date

September 2016 (Next publication scheduled: June 2017)

# Creating semiconductor products with exceptional environmental performance in order to achieve a sustainable society

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The semiconductors of the Renesas Electronics Group are used in electronic control units throughout automobiles in order to facilitate safe and comfortable travel. The role of semiconductors has grown even larger for electric vehicles and motor/gasoline engine hybrid engine systems, which have become more common in recent years, and the Group's products also contribute to controlling CO<sub>2</sub> emissions from vehicles. Furthermore, the Company's semiconductor products provide functionality to maximize the energy efficiency of our customers' products in fields other than automobiles, such as industrial equipment and household appliances. Our customers can feel confident using these semiconductor products because of the consideration that has been given, not just to functionality, but also to the impact on the global environment throughout the entire lifecycle of the products, from the design stage to disposal.

The manufacturing process of semiconductor products consumes a large amount of electricity due to the use of high-tech machinery that shapes fine components in a clean room, which is kept as free from dust particles as possible. It also requires many chemicals, so the environmental impact of production activities is significant. Therefore, at the Group's factories, we are introducing energy-efficient equipment, improving the efficiency of materials usage, and installing abatement facilities that do not impact the environment. Furthermore, we have implemented standards related to waste from factories that are even more stringent than those imposed by law, and we are working to maintain and manage the local environment.

The Renesas Electronics Group will continue to supply high-quality and environmentally friendly products that are made in clean and highly efficient manufacturing sites. In addition, we are confident that the Group's technological evolution will contribute to the earth and society of the future, while also helping to realize a future with dreams of even better things to come.

This report summarizes the initiatives and future outlook of the Group. It lists the results and targets of all environmental activities throughout all processes, from product development to manufacturing, sales, and the usage and eventual disposal by the customer.

We hope that you not only take in the content of this report, but that it prompts conversations that lead to even better environmental activities.



**Masahiko Nozaki**

Executive Vice President, Environmental Officer

## Corporate Outline

<b>Company Name</b>	Renesas Electronics Corporation
<b>Established</b>	November 1, 2002 (Started operation on April 1, 2010 as Renesas Electronics Corporation)
<b>Representative Directors</b>	Tetsuya Tsurumaru, Representative Director, Chairman Bunsei Kure, Representative Director, President and CEO
<b>Major Operations</b>	Research, development, design, manufacture, sale, and servicing of semiconductor products
<b>Headquarters</b>	TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan
<b>Capital Stock</b>	10 billion yen
<b>Net Sales</b>	693.3 billion yen (Year ended March 31, 2016)
<b>Employees (consolidated)</b>	Approximately 19,160 (As of March 31, 2016)
<b>Stock Listing</b>	Tokyo Stock Exchange, First Section (Securities Code: 6723)

# Renesas Electronics Group Environmental Measures

## Stance of the Renesas Electronics Group

Businesses in recent years have started environmental initiatives that have a wide range of approaches. Aside from combatting pollution, enterprises today are working to reduce greenhouse gases, lower emissions, regulate chemical content in products, and more. The Renesas Electronics Group works to reduce environmental burdens as guided by the cooperative targets of industry groups. We develop and offer products that save energy and lower environmental burden by increasing environmental performance. The yearly policies and targets of such environmental activities are deliberated upon in Environmental Promotion Meetings, chaired by the board member in charge of environmental issues.

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## Environmental Policy

**We will contribute to the harmonization of society and the environment in the course of our business activities.**

## Action Guidelines

1. We will incorporate environmental considerations into all stages of the product life cycle, including research & development, design, procurement, production, sales, logistics, use and disposal.
2. We will strive to prevent pollution as well as to minimize the impact of our products on the environment. When environmental problems arise, we will take appropriate steps to minimize the environmental impact and disclose accurate information.
3. Our environmental management efforts will involve compliance with all environmental laws, regulations and agreements, and we will promote compliance activities.
4. We will disclose environmental information to stakeholders and encourage communication with society for the purpose of promoting mutual understanding.
5. We will educate all employees in environmental conservation to create a company culture that promotes harmony between the environment and business activities.

## Three Environmental Cornerstones of Renesas Electronics

Some of the key issues for our environmental measures are 1) legal compliance, 2) reduction of our environmental burden, 3) the development of eco-friendly products and 4) maintaining good relations with stakeholders.

We are tackling these issues through environmental management, in

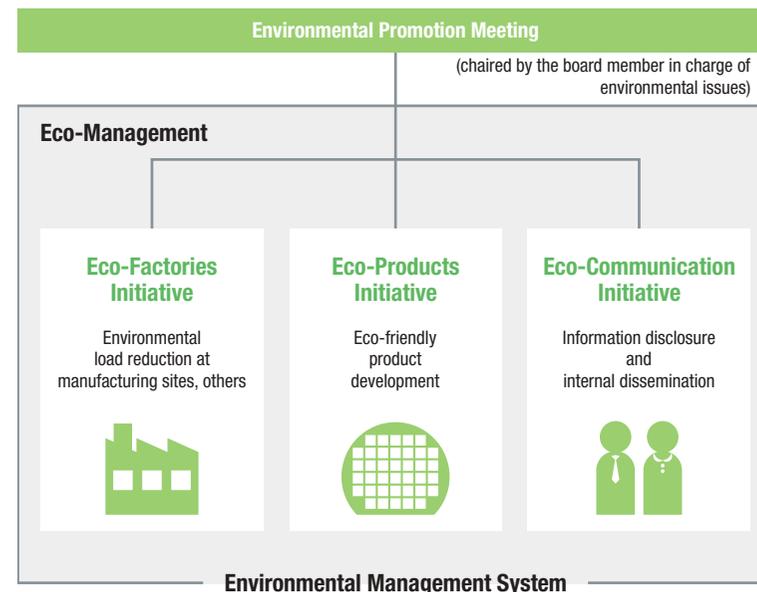
which all employees participate. Such management is based on an Eco-Management system, built on the cornerstones of our Eco-Factories, Eco-Products and Eco-Communication Initiatives.

•**Eco-Factories Initiative:** Aimed at reducing the environmental impact of manufacturing sites through the reduction of greenhouse gases (GHG) and the appropriate management of chemical substances in manufacturing processes

•**Eco-Products Initiative:** Aimed at supplying eco-friendly semiconductors produced with environmental considerations in mind throughout their life cycles, including the control of chemical substances contained in products and the development of products with excellent energy-saving performance

•**Eco-Communication Initiative:** Aimed at strengthening employee awareness through environmental education and disseminating the Group's environmental information to society

## Three Environmental Cornerstones of Renesas Electronics



**Until March 2016 Initiative Results and Targets until December 2016**

Item	Mar. 2016 Targets	Mar. 2016 Results	Evaluation	Dec. 2016 Targets
<b>Eco-Management</b>	<ul style="list-style-type: none"> <li>Optimize environmental management systems and organize certification systems</li> </ul>	<ul style="list-style-type: none"> <li>Combined development and sales sites with head office, and organize certifications</li> </ul>	◎	<ul style="list-style-type: none"> <li>Obtain common domestic certification</li> </ul>
<b>Eco-Factories Initiative</b>	<ul style="list-style-type: none"> <li>Reduce 3% or more from benchmark year (energy consumption per unit sales)</li> </ul>	<ul style="list-style-type: none"> <li>Reduced energy consumption per unit sales 27% from benchmark year</li> </ul>	◎	<ul style="list-style-type: none"> <li>Reduce 4% or more from benchmark year (energy consumption per unit sales)</li> </ul>
	<ul style="list-style-type: none"> <li>Reduce PFC*1 emissions from previous year's results (per unit wafer area)</li> </ul>	<ul style="list-style-type: none"> <li>Reduced PFC emissions 0.01 GWP-kg/cm<sup>2</sup> (per unit wafer area)</li> </ul>	◎	<ul style="list-style-type: none"> <li>Reduce PFC emissions from previous year's results (per unit wafer area)</li> </ul>
<b>Eco-Products Initiative</b>	<ul style="list-style-type: none"> <li>Deal properly with foreign and Japanese regulations</li> </ul>	<ul style="list-style-type: none"> <li>Dealt with substances subject to Japanese and foreign regulations and voluntary regulations</li> </ul>	◎	<ul style="list-style-type: none"> <li>Deal appropriately with foreign and Japanese regulations</li> </ul>
<b>Eco-Communication Initiative</b>	<ul style="list-style-type: none"> <li>Publish CSR report and enhance Web content</li> </ul>	<ul style="list-style-type: none"> <li>Published an electronic version of the CSR report</li> </ul>	◎	<ul style="list-style-type: none"> <li>Publish an electronic version of the environmental report</li> </ul>
	<ul style="list-style-type: none"> <li>Review training materials and conduct training</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced training materials for manufacturing divisions</li> </ul>	◎	<ul style="list-style-type: none"> <li>Implement Environment e-learning 2016 and maintain the targeted attendance rate</li> </ul>
	<ul style="list-style-type: none"> <li>Ensure participation of 98.3% or more of employees in Environment e-learning</li> </ul>	<ul style="list-style-type: none"> <li>98.4% of employees participated in Environment e-learning</li> </ul>	◎	
	<ul style="list-style-type: none"> <li>Continue environmental and social contribution activities</li> </ul>	<ul style="list-style-type: none"> <li>Activity implemented (Please refer to pages 15 and 16.)</li> </ul>	◎	<ul style="list-style-type: none"> <li>Continue environmental and social contribution activities</li> </ul>

\*1 PFC: Perfluorocompound (The semiconductor industry has specified CHF<sub>3</sub>, CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, C<sub>4</sub>F<sub>8</sub>, SF<sub>6</sub> and NF<sub>3</sub> for emissions reduction.)

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## The Group's Business Activities and Environmental Footprint

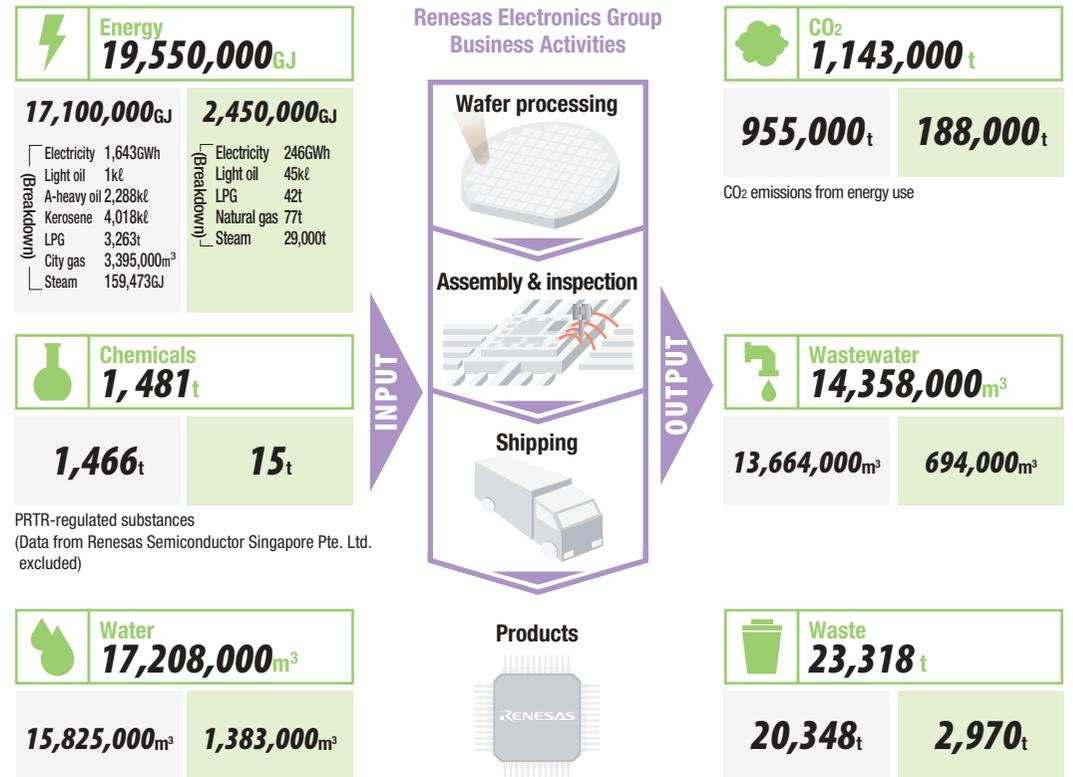
The semiconductor products and solutions offered by the Renesas Electronics Group help our customers make their own products and systems smaller and more energy efficient. This boosts protection of the global environment by helping to prevent global warming and use resources effectively.

On the other hand, it is true that production activities place a large burden on the environment. They consume energy (electric power, fuel, etc.) and resources (chemicals, water, etc.) while producing waste in solid, liquid, and gaseous forms.

We are attempting to reduce our environmental impact by conducting detailed measurements of our volume of input and output from production to distribution, and making planned reductions.

The Renesas Electronics Group is committed to using limited resources and energy in an effective manner and to offering eco-friendly products that are manufactured efficiently.

## Overview of Environmental Footprint



## Internal Audits of Environmental Law Compliance Systems and Environmental Management Systems

The Renesas Electronics Group's Basic Rules of Management set out our Environmental Policy and Basic Rules of Environmental Management. Following these guidelines, our bases, including affiliated companies, each establish an environmental management system and conduct environmental initiatives. Each year, we conduct mutual audits within the Group to check that our environmental management systems and performance are continually improving. In fiscal 2016, we performed mutual audits at 12 sites. The 144 suggestions yielded by this process, including 76 requested improvements, are leading to better outcomes overall. To meet our aim of conducting highly reliable audits, the Group has CEAR\*1-certified auditors with environmental management system auditor qualifications to perform mutual audits. Furthermore, in response to the environment-related laws and regulations, which grow more stringent each year, we have constructed an information-sharing system and a compliance system, and monitor the compliance status at all sites.



Outdoor worksite audit



Manufacturing site audit

\*1 CEAR: Center of Environmental Auditors Registration

## ISO 14001 Certification

All of the Group's domestic sites and all of its overseas manufacturing sites and major sales sites have acquired certification under ISO 14001, the international standard for environmental management systems. The Group will continue the process of acquiring and sustaining ISO 14001 certification as efficiently and effectively as possible.

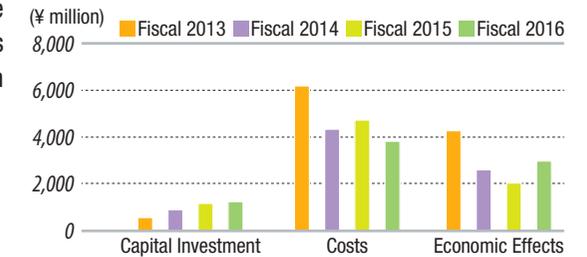
Furthermore, the implementation of measures to comply with the ISO 14001 2015 revisions will be completed in December 2016, and we are promoting a plan to start an environmental management system that satisfies the requirements imposed by the revisions in January 2017.

## Environmental Accounting

Major investments in fiscal 2016 were in measures to meet the Water Pollution Control Law. We also took such energy conservation measures as making our air-conditioning systems and freezers more efficient, enabling pumps to conserve electric power, and installing LED lighting. Of the costs, air pollution prevention totaled ¥500.6 million, water and soil pollution prevention ¥1,523.6 million, and waste processing ¥601.3 million.

The economic effects included ¥962.8 million in proceeds from sales of recyclables. These figures do not include economic effects calculated based on estimates.

### Environmental Accounting Trends



## Fiscal 2016 results

Category/ Subcategory	Description	Environmental Conservation Costs		Effects	
		Capital Investment (¥ million)	Cost (¥ million)	Economic Effects (¥ million)	Environmental Impact Reduction
Within Business Sites	Pollution Prevention Pollution prevention (air, water, etc.)	659	2,056	29	Energy use reduction 106.7GWh
	Energy Conservation/ Global Environmental Conservation	578	659	1,715	
	Resource Recycling	8	689	1,237	
Upstream/ Downstream Processes	Green procurement, product assessment, recovery and recycling of packaging materials, etc.	0	0	—	
Management Activities	Maintenance and adminis- tration of environmental management systems, envi- ronmental education, etc.	0	403	—	
R&D	R&D for reducing the envi- ronmental impact of products and production processes	0	0	—	
Social Contribution Activities	Local volunteer activities, do- nations and assistance to en- vironmental organizations	0	11	—	
Environmental Damage	Cleaning up pollution (soil, groundwater, etc.), compensa- tion in connection with envi- ronmental conservation, etc.	0	4	—	
Total		1,245	3,822	2,981	—

## Global Warming Prevention through Energy Conservation

The Renesas Electronics Group takes an active part in semiconductor industry initiatives to help prevent global warming. We also work continuously to conserve energy in a number of ways to meet electrical and electronic industry association targets and emissions intensity reduction targets under the Law Concerning the Rational Use of Energy.

## Reducing Energy

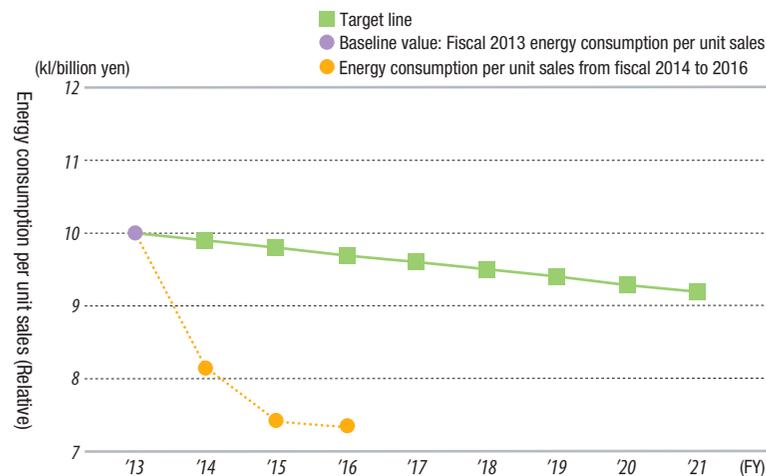
The Renesas Electronics Group began participating in the Commitment to a Low Carbon Society, an effort of the electrical and electronic industry, in fiscal 2014. Under the commitment, the baseline value for a business is the value for fiscal 2013 and its target is to reduce energy consumption from the baseline (of fiscal 2013) by an average of 1% per year through fiscal 2021 (7.73% decrease compared to the value in fiscal 2013).

## Results of Fiscal 2016 Reductions

As of fiscal 2016, we have reduced energy use by 26% from the benchmark year. This is a 1 point reduction over the previous fiscal year (fiscal 2015).

Because the electric power supply is forecast to remain tight in fiscal 2017 and beyond, we will continue to actively take measures that focus on

Energy consumption per unit sales



energy conservation as we strive to cut CO<sub>2</sub> emissions. We will continue the fight against global warming through our membership in the Commitment to a Low Carbon Society, a group in which the electrical and electronic industry associations participate.

## Energy Reduction on Production Lines

We are also working toward achieving our energy conservation target under the Law Concerning the Rational Use of Energy, and therefore on our production lines we seek to reduce the rate of energy consumption by 1% year on year. Specifically, we have systematically taken such measures as putting air conditioners, pumps, fans, etc. under inverter control, replacing lighting with LEDs, and chillers and boilers with energy-saving models. We are also optimizing equipment operation based on our production volume.

## Major Measures Taken in Fiscal 2016

Renesas Electronics accounts for energy conservation effectiveness and investment effectiveness, giving priority to implementing effective measures. Major measures taken in fiscal 2016 included the following.

- Replacing lighting with LEDs
- Making air-conditioning systems more efficient
- Making freezers more efficient
- Enabling pumps to conserve electric power

## Energy usage reduction through the fitting of inverters to clean room circulating air conditioners (Saijo Factory)

We reduced the amount of air circulated by 5% by fitting inverters to circulating air conditioners in clean rooms.

## Reducing GHG Emissions

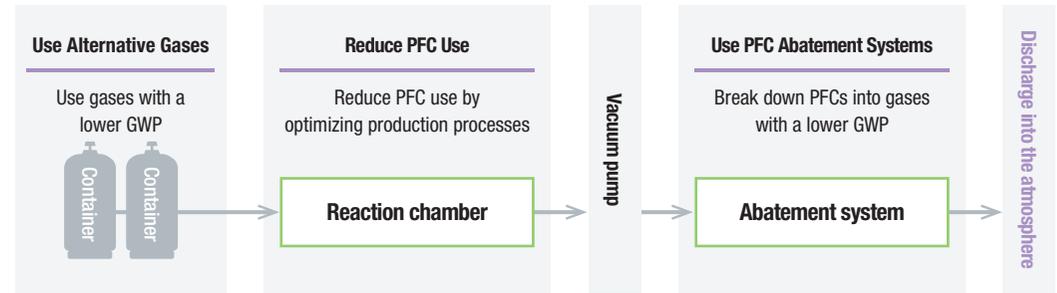
The Renesas Electronics Group uses PFC\*<sup>1</sup> gas, which is a greenhouse gas, primarily as a reaction chamber cleaning gas for semiconductor production processes. These gases do not readily decompose, and since their global warming potential (GWP\*<sup>2</sup>) is between 7,000–20,000 or even higher, it is critical to reduce these emissions. The Group has therefore set PFC gas emission reduction targets and is actively working to help prevent global warming. Methods of reducing the greenhouse effect of PFC gases include 1) switching to gases with a lower GWP, 2) optimizing processes to reduce the volume of PFC gases used, and 3) installing abatement systems that remove PFC gases to break them down. The Group has been developing technology to cut emissions to 90% or lower in 2010 as compared to 1995, using a combination of these three techniques.

In 2015, we continued working toward that target as we engaged in reduction initiatives. While production volume did have an effect, emissions were kept to only about 20% of the 1995 level. Thanks to our ongoing reduction initiatives, we have achieved our reduction targets since 2008 and are steadily cutting emissions of greenhouse gases. We will pursue further emissions reductions in 2016 and beyond.

\*1:Perfluorocompound (The semiconductor industry has specified CHF<sub>3</sub>, CF<sub>4</sub>, C<sub>3</sub>F<sub>8</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>8</sub>, SF<sub>6</sub> and NF<sub>3</sub> for emissions reduction.)

\*2:Global warming potential, a coefficient indicating how much a given mass of greenhouse gas is estimated to contribute to global warming (CO<sub>2</sub>=1)

## GHG Emissions Reduction Image



## PFC Gases and GWP

PFC gas	GWP*
CF <sub>4</sub>	7,390
C <sub>2</sub> F <sub>6</sub>	12,200
C <sub>3</sub> F <sub>8</sub>	8,830
C <sub>4</sub> F <sub>8</sub>	10,300
CHF <sub>3</sub>	14,800
SF <sub>6</sub>	22,800
NF <sub>3</sub>	17,200

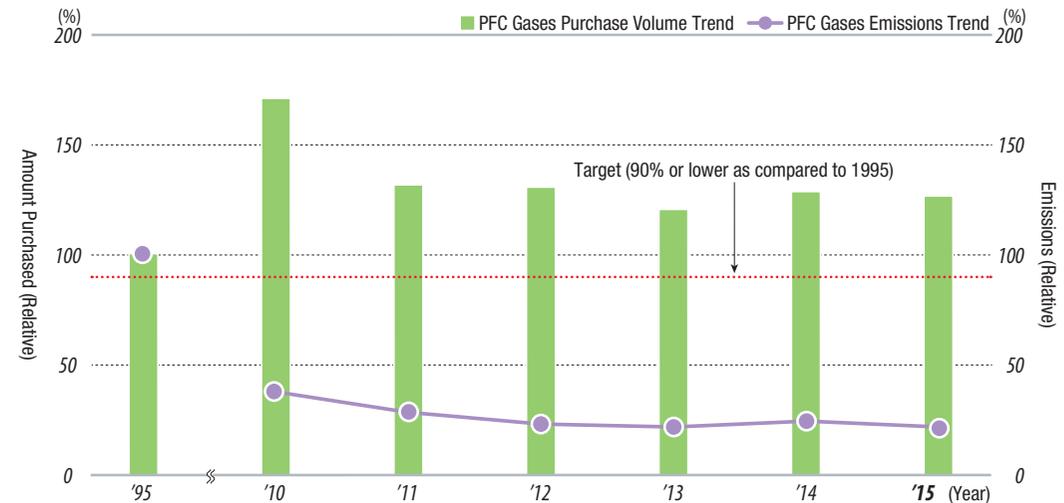
\*2006 IPCC Guidelines

## PFC Gases Subject to Reduction Initiatives

Gases subject to reporting under the Act on Promotion of Global Warming Countermeasures	Seven gases subject to reduction by the semiconductor industry
CO <sub>2</sub> (carbon dioxide)	Controlled as CO <sub>2</sub> attributable to energy use
CH <sub>4</sub> (methane)	Not covered
N <sub>2</sub> O (nitrous oxide)	Not covered
HFC (hydrofluorocarbon)	CHF <sub>3</sub>
PFC (perfluorocarbon)	CF <sub>4</sub> , C <sub>2</sub> F <sub>6</sub> , C <sub>3</sub> F <sub>8</sub> , C <sub>4</sub> F <sub>8</sub>
SF <sub>6</sub> (sulfur hexafluoride)	SF <sub>6</sub>
NF <sub>3</sub> (nitrogen trifluoride)* <sup>1</sup>	NF <sub>3</sub>

\*1 NF<sub>3</sub>: Subject to reporting from fiscal 2016

## PFC Gases Purchase Volume and Emissions Trends



# Eco-Factories Initiative

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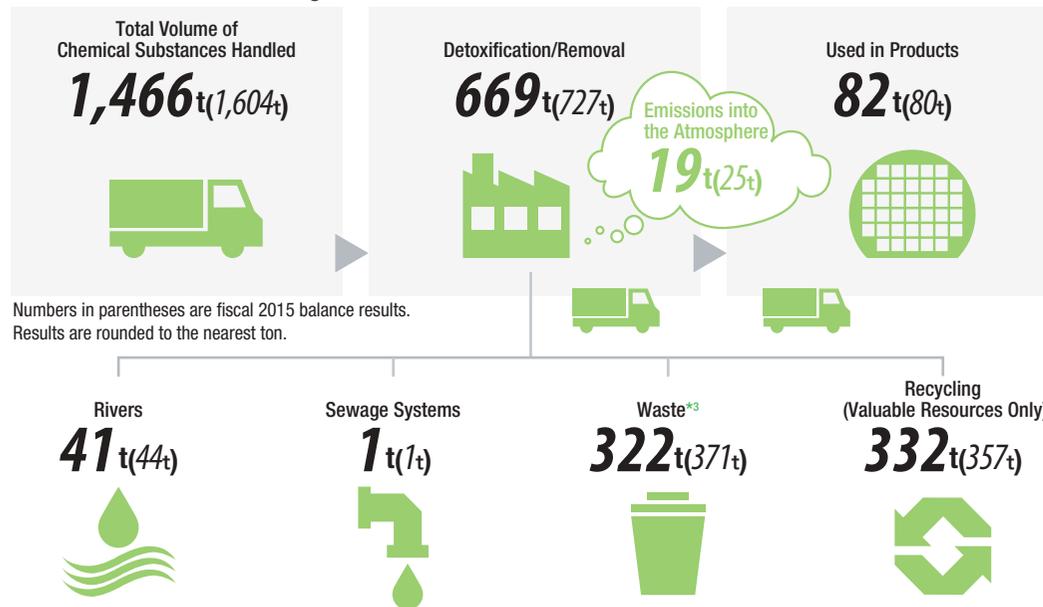
## Chemical Substance Management

The Group conducts various assessments of the chemical substances it uses, based on its chemical substance database compiled through green procurement activities and the acquisition of information about related laws and regulations. The Group strives to accurately understand and reduce the total volume of chemical substances used and manages the volume of hazardous chemical substances used and their emissions. In this manner, we are pursuing research and development for green products and eco-factories. Under risk management, we practice material-balance management without rounding down figures on the amount of PRTR<sup>\*1</sup>-regulated chemical substances and VOCs<sup>\*2</sup> we handle. The results of this material-balance management are reported to the relevant authorities, and are also analyzed and utilized in our activities to promote the use of alternative substances and reduce chemical substance emissions.

<sup>\*1</sup>: Pollutant Release and Transfer Register Law (A law concerning the monitoring of emissions of specified chemical substances into the environment and their management)

<sup>\*2</sup>: Volatile organic compounds

### Fiscal 2016 Balance of PRTR-Regulated Chemical Substances



Numbers in parentheses are fiscal 2015 balance results. Results are rounded to the nearest ton.

<sup>\*3</sup>: Includes waste for recycling at the Company's expense.

## Reducing VOC Emissions

In the Renesas Electronics Group, VOCs such as isopropyl alcohol and xylene are released from factories only after they have been rendered as harmless as possible by equipment that processes organic gas emissions. Along with this, we optimize production processes and use production equipment effectively as we endeavor constantly to lower VOC emissions.

Fiscal 2016 VOC emissions fell substantially compared to fiscal 2001, by about 29%, showing that our measures so far are steadily paying off. Going forward, we will continue our proactive efforts to cut VOC emissions, which includes further optimizing production processes.

### VOC Emissions Trend



# Eco-Factories Initiative

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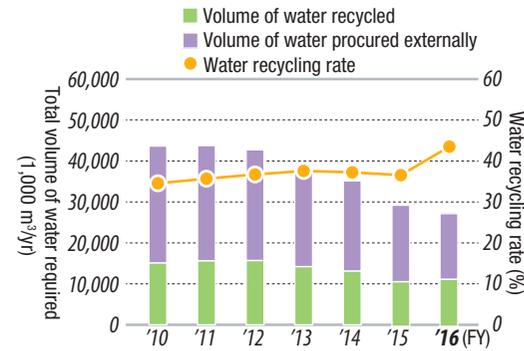
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## Conserving Water Resources

The Renesas Electronics Group is conserving water by actively recycling and reusing it.

In fiscal 2016, total water consumption was 27,320,000m<sup>3</sup>, of which we recycled 42.1%. Moreover, the amount of water taken from the water supply was down 14.4% compared to fiscal 2015.

### Domestic Water Consumption and Recycling Rate



Total volume of water required = volume of water recycled + volume of water procured externally  
Water recycling rate = volume of water recycled ÷ total volume of water required × 100

## Environmental Measures in Logistics Operations

The Renesas Electronics Group implements various environmental measures in its logistics operations. Specific measures include the reduction of energy used for the transport of products and waste, reduction and reuse of product packing materials, and switching to eco-friendly company vehicles.

Pursuant to the revision to Japan's Law Concerning the Rational Use of Energy, which stipulates "Specified Consignor" obligations, the Group is striving to reduce CO<sub>2</sub> emissions in its logistics operations. In fiscal 2016, the Group reorganized manufacturing sites and warehouses in Japan. As a result, our domestic shipping volume declined 10.4% from the previous year. We will continue our efforts to reduce energy use in logistics operations in fiscal 2017 and beyond.

### Domestic shipping volume

Fiscal Year	Renesas Electronics	Totals for Each Group Company
2012	12.55 million ton-km	7.22 million ton-km
2013	11.78 million ton-km	6.69 million ton-km
2014	8.62 million ton-km	5.66 million ton-km
2015	7.65 million ton-km	5.05 million ton-km
2016	6.36 million ton-km	5.02 million ton-km

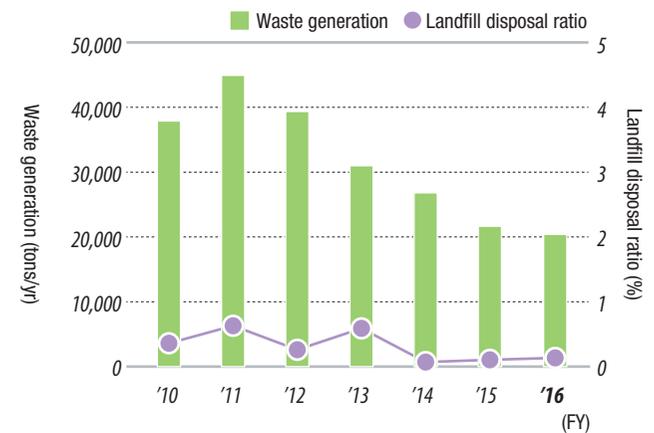
## Waste Management

The Renesas Electronics Group's waste management target for fiscal 2016 was to "maintain our zero-emissions status (landfill disposal ratio of less than 1%)." We were able to realize this goal with a landfill disposal ratio of 0.14%, and thus achieved zero emissions.

Additionally, we practiced strict legal compliance and continued to periodically visit our industrial waste processing contractors to ensure that they were processing waste appropriately.

The Group practices strict storage, management and reporting of equipment that uses PCBs, in accordance with the law. Furthermore, we aim for complete disposal in a safe and secure manner within the legally mandated period. We are promoting disposal according to the basic policy of the Japanese government, through entrustment of disposal of high-concentration PCB waste to the Japan Environmental Storage & Safety Corporation (JESCO), and entrustment of disposal of waste containing low concentrations of PCB to accredited detoxification facilities.

### Domestic Waste Generation and Landfill Disposal Ratio



## Protecting the Ozone Layer

The Montreal Protocol on Substances That Deplete the Ozone Layer classifies ODSs\*1 into Class I (CFCs\*2, etc.) and Class II (HCFCs\*3). The Group has completely eliminated the use of all of these from our production processes.

Furthermore, we are systematically reducing the use of CFCs used as refrigerants in chillers, refrigerators, air conditioners and other equipment and replacing them with alternative substances in line with Montreal Protocol program. We are also recovering ODSs when affected equipment is scrapped and making sure these substances are destroyed.

\*1: Ozone-depleting substances

\*2: Chlorofluorocarbons

\*3: Hydrochlorofluorocarbons

## Overseas Initiatives

The Renesas Electronics Group's overseas manufacturing sites conduct environmental initiatives using ISO 14001 environmental management, based on the Group's Environmental Policy. Each manufacturing site sets its own targets and specific measures in accordance with local legal regulations and industry initiatives.

## Examples of Overseas Initiatives

### ■ Renesas Semiconductor (Beijing)

At Renesas Semiconductor (Beijing) Co., Ltd., we conducted a tour of the Beijing Gaobeidian Wastewater Treatment Plant in June 2015, and gained an understanding of the sewage treatment process. Through this tour, we learned about the importance of every drop of water. We will treat what we learned during this tour as a lesson and conduct environmental conservation accordingly.



### ■ Renesas Semiconductor (Malaysia), Renesas Semiconductor (Kedah)

In March 2016 Renesas Semiconductor (Malaysia) Sdn. Bhd. and Renesas Semiconductor (Kedah) Sdn. Bhd. jointly participated in the sea turtle education program at the Turtle Hatchery Center at Pantai Kerachut, which is located in the Penang National Park. We learned about the importance of conservation of the environment, such as biodiversity, through the example of sea turtles, which are an endangered species.



## Preventing Soil Pollution

The Group is conducting initiatives to avoid soil pollution. Major initiatives conducted in fiscal 2016 are listed below:

- Installation of water surface monitors in organic waste liquid tanks
- Raising wastewater tanks above ground level
- Enhancing leak prevention measures in wastewater pipes

### Example of Initiatives to Enhance Leak Prevention Measures in Wastewater Pipes (Saijo Factory)

We have achieved visualization of piping by laying discharge pipes in concrete troughs. This construction not only makes it easier to monitor pipes, but if a pipe happens to break, there is no direct penetration underground.



Visible factory wastewater pipes

# Eco-Products Initiative

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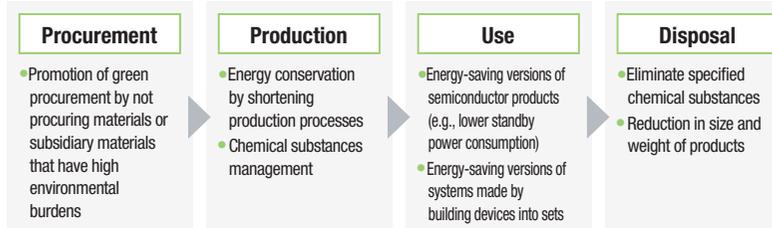
Eco-Communication  
Initiative

## Eco-Products Initiative

Customers' environmental requirements for our semiconductor products are growing stricter every year. The Renesas Electronics Group is proceeding with its Eco-Products Initiative to meet these requirements. To turn a product into an eco-product, it is important to build in a variety of innovations at the development and design stages to reduce environmental burden at all life cycle stages, including procurement, production, usage and disposal.

Our eco-products are made possible through product environmental assessments, which are comprehensive evaluations of the product environmental burden reduction measures. Product environmental assessments are divided into two stages: At the time of development and prior to mass production.

### Eco-Products Initiative at Each Stage

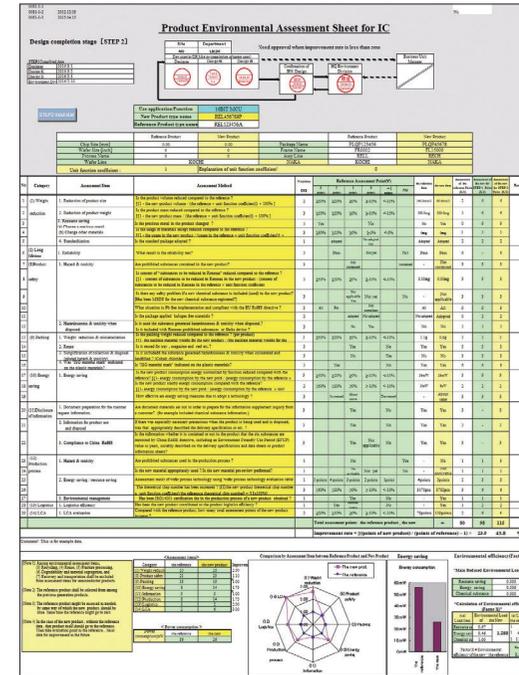


### Creation of Eco-Friendly Products

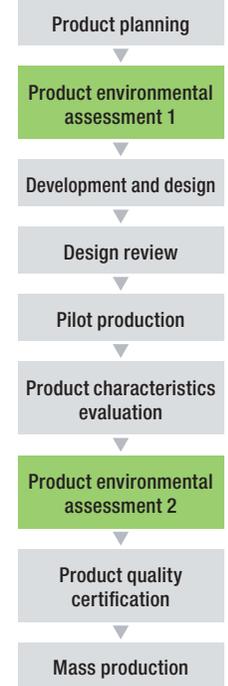
As a way to create eco-friendly products, we include a product environmental assessment (see figure on right), a way of evaluating how much a project mitigates environmental burden, into our development and design flow. The evaluation compares new products against old ones in eight categories, including volume reduction, product safety, and energy savings. The process yields quantifiable results that can be visualized, for example with charts. This helps improve the performance of our semiconductor product itself, and when used in our customers' products, helps make them smaller and more energy-efficient. This ultimately decreases the environmental burden of the customers who use those products.

Information about eco-friendly products (Eco-Products Initiative)  
<https://www.renesas.com/ja-jp/about/company/csr/ecoproduct.html>  
(Japanese language only)

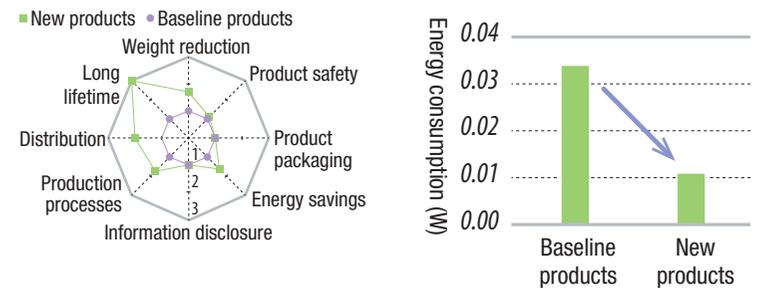
### Example of Product Environmental Assessment Sheet



### Example of Development and Design Flow



### Product Environmental Assessment Results Chart and Energy Consumption Comparison



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## Promoting Green Procurement

Renesas Electronics is promoting green procurement. Specifically, the Company prioritizes the procurement of ecofriendly products free of hazardous substances from suppliers who are proactively promoting environmental protection. These guidelines are disclosed to all suppliers and the Company conducts periodic investigations on the environmental measures implemented by suppliers. In addition, the Company advances its procurement initiatives with the understanding and cooperation of our suppliers in relation to testing of purchased items for hazardous substances, compliance with the European Union's RoHS directive\*<sup>1</sup> and other laws and regulations.

## Compliance with Environmental Laws and Regulations

Embedded in a wide range of finished products, Renesas Electronics' semiconductors are being used worldwide. In order to ensure compliance with environmental laws and regulations related to its products and to enable necessary countermeasures for potential issues, Renesas Electronics is working to obtain information regarding such laws and regulations in major countries immediately after its publication.

## Major Environmental Laws Overseas and Our Response

The RoHS Directive\*<sup>1</sup> and the ELV Directive\*<sup>2</sup> of the European Union have defined threshold values for chemical substances contained in certain products. In response to these and similar directives, Renesas Electronics makes sure that it receives product analysis data from suppliers of semiconductor device components as well as reports certifying that their products are free of banned substances. In addition, we conduct voluntary analysis of these components to confirm that sub-threshold values are observed.

**\*1 RoHS Directive:** EU directive on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment. Limits content of lead, mercury, cadmium, hexavalent chromium and brominated flame retardants (PBB, PBDE).

**\*2 ELV Directive:** EU directive on End-of-Life Vehicles. Limits content of lead, mercury, cadmium and hexavalent chromium.

 European RoHS initiatives  
<https://www.renesas.com/en-eu/support/products-common/lead/rohs.html>

## Initiatives in China

China's Administrative Measures for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products—also known as China RoHS 2—requires manufacturers to use specific labels on products that contain designated toxic and hazardous substances. Semiconductor products are not electrical and electronic end products, so information related to each chemical substance contained in products and product Environment Friendly Use Period (EFUP) values is provided through sales companies and authorized dealers without directly marking the products.

 Information about China RoHS  
<https://www.renesas.com/en-eu/support/products-common/lead/rohs.html>

## Initiatives in Europe

Renesas Electronics is not required to register its semiconductor devices under the EU's REACH Regulation\*<sup>3</sup>, since they are articles (finished products) that do not intentionally emit chemical substances. Moreover, we obtain information related to substances of very high concern (SVHCs\*<sup>4</sup>) from the supply chain and provide it to customers.

The Group will continue to closely monitor movements of environmental laws and regulations overseas and implement appropriate measures.

**\*3 REACH Regulation:** Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals. Requires registration and evaluation to produce or import chemical substances in the EU, requires authorization for substances of very high concern, and sets limits (including bans) on high-risk substances.

**\*4 SVHC:** Substances of Very High Concern (because they harm or may harm health and safety.)

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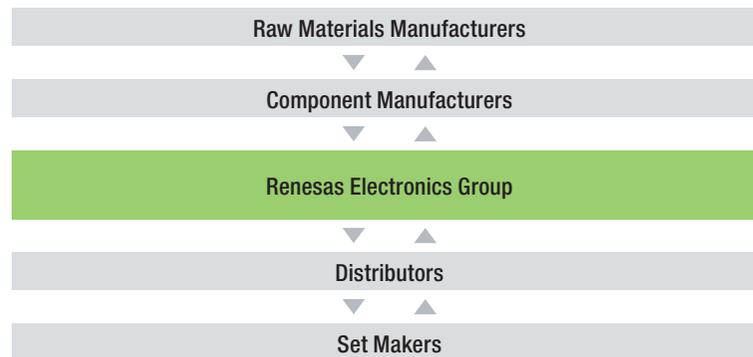
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## Product Environmental Quality

At Renesas Electronics Group, we believe that product chemical substance management in all processes, from material selection during design and development to preventing pollution during the manufacturing process, requires working with the entire supply chain. Thus we have our suppliers certify that their products do not contain prohibited substances and have them provide analysis data. We also conduct supplier audits to confirm their management systems. We additionally ask our sales companies and agents to manage the chemical substances they use in their packing materials. We also provide information on the chemical substances and RoHS Directive and prohibited substance analysis data to our customers so that they can use our products with confidence. Moreover, we allow customers to confirm the Group's management system for chemical substances and the actual activities.

### Product Chemical Content Control throughout the Supply Chain



Provide Certificate and Evidence (Analysis Data) of Non-use of Prohibited Chemicals

## Voice

### — Comments from AOI ELECTRONICS Co., Ltd. —

“At AOI ELECTRONICS, we manufacture and sell electronic components, just like Renesas Electronics. We work to reduce environmental impact and environmental risk in the course of our business activities, and strive to conduct environmentally conscious management.”

“In recent years, customers have sought high-quality, environmentally conscious products. The details of Renesas' Eco-Products Initiative are published on their website, and information disclosure is reliable and transparent. We continue to have high expectations of the Renesas Electronics Eco-Products Initiative.”



**Masahiro Kuwabara**  
Deputy Manager, Sales Division,  
AOI ELECTRONICS Co., Ltd.

## Communication with Local Communities

The Electronic Device Division of Renesas Semiconductor Package & Test Solutions Co., Ltd., was selected from among 733 participating worksites as an exceptional worksite at the Summer Eco-Style Challenge, which was conducted in Yamagata Prefecture as part of the public awareness campaign for 2015 summer prefectural energy-saving initiatives.

Every year Yamagata Prefecture calls for worksites in the prefecture to implement specific initiatives for energy consumption reduction in summer, when energy demand increases, and select worksites that achieve notable results. We have received public acknowledgment on the Yamagata Prefecture official website as an example of a company that has taken exceptional initiatives.

 <http://www.pref.yamagata.jp/pickup/interview/pressrelease/2016/01/22111136/>  
(Japanese language only)

Each of our production bases actively continued to participate in local clean-up activities with local residents also in fiscal 2016.

- **Kochi Factory:** Collective clean-up activities in Konan City
- **Shiga Factory:** Beautification activities in the area around the factory, in front of the station and the environs of Lake Biwa
- **Oita Factory:** Beach cleanup
- **Saijo Factory:** Saijo City Clean Walk



## Environmental Education

The Renesas Electronics Group's environmental education system is divided into a general environmental education program and a specialized environmental education program.

In the general environmental education program, the Group provides basic environmental education to help all our Group executives and employees acquire necessary environmental knowledge mainly through online sessions. Meanwhile, the specialized, operation-specific environmental education program has been designed to allow employees to gain the environmental knowledge required for their respective operations. This program offers education and training specific to the individual fields of development, design, sales and manufacturing. Finally, the ISO 14001 and ISO 19001 education programs help employees understand the certification systems and help internal auditors develop their auditing skills.

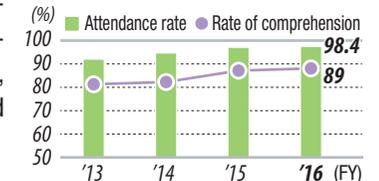
## Renesas Electronics Environmental Education System

Program	Purpose	Fiscal 2017 target
General Environmental Education	Raising the environmental awareness of employees	<ul style="list-style-type: none"> <li>• Basic environmental education (for all Group employees)</li> <li>• Position-specific education (new employees/new leaders/new managers)</li> </ul>
Specialized Environmental Education	Gaining environmental knowledge required for operations	<ul style="list-style-type: none"> <li>• Environmental education for the development, design, and sales divisions</li> <li>• Environmental education for sales strategists</li> <li>• Environmental education for manufacturing divisions</li> </ul>
(ISO14001 · ISO19001) Education	<ul style="list-style-type: none"> <li>• Understanding the ISO 14001 certification system</li> <li>• Developing the skills of internal auditors</li> </ul>	<ul style="list-style-type: none"> <li>• Basic ISO 14001 education</li> <li>• ISO 19001 education</li> <li>• Internal auditor education</li> <li>• Environmental education for manufacturing divisions</li> </ul>

## Fiscal 2016 Achievement

We offered general environmental education covering details including the latest status of environmental problems and environmental laws and regulations to our newly appointed managers and employees in the manufacturing divisions. We also offer an online basic environmental course intended for all Group employees. In many cases, this course forms part of a division's targets, and the attendance rate has been increasing annually since its introduction in fiscal 2012. The results of questionnaire surveys of participants demonstrate the effectiveness of the program, and are reflected in the materials used when the program is next conducted.

**Trends in attendance rate for basic environmental training and rate of comprehension**



## Comments from Environmental Education Participants

- I understood that abnormal weather around the world, which is caused by global warming, is a pressing and serious issue. I would like to promote ecological initiatives and contribute to environmental conservation so that we do not pass on a negative legacy to our children.
- I am against the notion that just because the level of Japan's energy self-sufficiency is low, that we must return to nuclear power. I would like to actively work toward the adoption of renewable energy, such as solar and wind power, at Renesas.
- The concept that simply fulfilling our work duties produces environmentally considerate products, which leads to ecological results, is easy to understand.
- The preservation of biodiversity was added to the teaching materials, and I realized the importance of the coexistence of people and animals, as well as the protection of nature. I gained a renewed awareness that it is necessary for us to develop small grass-roots initiatives.

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## Biodiversity Conservation Activities

We are conducting activities to preserve water quality at the Renesas Semiconductor Manufacturing Co., Ltd. Yamaguchi Factory. We have established a Biotope\*1 beside the final outlet, and we are observing the direct impact of the water outflow from our factory on aquatic organisms. As a result, we have confirmed the spawning, hatching, and maturation of organisms, and the establishment of aquatic organisms. Through these activities to preserve water quality, we have confirmed the existence of a wide variety of organisms (more than 15 types), and we are maintaining good water quality.

Furthermore, we are conducting these activities to preserve water quality at the Renesas Semiconductor Manufacturing Co., Ltd. Kochi Factory and Saijo Factory. In order to ensure the water quality of factory outflow, we are raising killifish and goldfish in our water retention basins. The killifish that we raise are donated to local preschools and elementary schools.

\*1 **Biotope**: A habitat for a biological community



## Forest Preservation Activities

The Group conducts forest conservation activities in various places. In fiscal 2016, the Kumamoto Kawajiri Factory received a certificate for 33.36 tons of CO<sub>2</sub> offsets.



## Provision of Various Information

### Site Reports

The Group issues site reports for its domestic sites and Group companies primarily for the sake of local communities.

• Naka Factory, Renesas Semiconductor Manufacturing Co., Ltd.

 <https://www.renesas.com/ja-jp/media/about/company/csr/office/naka/kankyo-report2015-naka.pdf>  
(Japanese language only)

• Shiga Factory, Renesas Semiconductor Manufacturing Co., Ltd.

 <http://www5.city.otsu.shiga.jp/kankyou/content.asp?key=0120110303&skey=0>  
(Otsu City Environment Division website, Japanese language only)

• Takasaki Site, Renesas Electronics Group (Issued as hard copy)

### Presentations at an International Conference

We gave two presentations at the International High Technology Environment, Safety and Health (IHTESH) Conference, which was held in Kobe, in June 2016. The titles of our presentations were “Initiative of Renesas Electronics Green Eco-Products Activity” and “Reduction of CO<sub>2</sub> Emissions from the Conversion of Boiler Fuel”.

