Renesas Electronics

ENVIRONMENTAL REPORT 2018

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RENESAS

BIG IDEAS FOR EVERY SPACE

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How to Use

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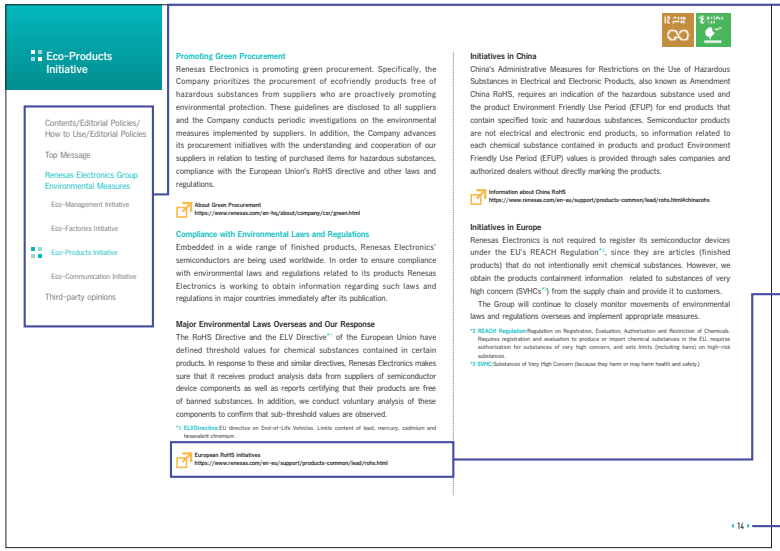
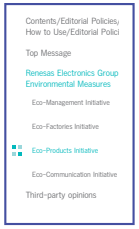


Category tab



Go to top page in each category.

Link button

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

Links to site outside of the report.

Navigation button

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About the logo symbols used for the SDGs(Sustainable Development Goals)

The following 4 out of 17 goals adopted at the United Nations Sustainable Development Summit are applicable in this environmental report.
http://www.unic.or.jp/activities/economic_social_development/sustainable_development/2030agenda/

Logo	Goal	Details of the goal	Corresponding page
	Responsible consumption and production	Ensure sustainable consumption and production patterns	P12, P13, P14
	Specific action for climate change	Take urgent action to combat climate change and its impacts	P7, P8, P11
	Protect life below water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	P9
	Protect life on land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and biodiversity loss	P9, P10, P11, P12, P13, P14, P16

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.

Reporting Period

Mainly from January 1 to December 31, 2017 while also including activities after this period.

Publication Date

July 2018(Next issue: Scheduled in July 2019)

We will contribute to a sustainable society by supplying energy efficient, environmentally friendly products.

In recent years, IoT (Internet of Things) systems have proliferated to the point that we now exchange information with sensors and devices connected to a cloud or server, and more and more of the devices that we use every day are connected to networks. Furthermore, as automated driving control technology makes dramatic advances, there is an emerging need to realize the individual functions of communication, control, and computation, as well as the functionality to connect these. Many semiconductor products are required for these functions to be realized, and the number of semiconductor products used for a single IoT system or a single vehicle is increasing rapidly.

The Renesas Electronics Group contributes to the realization of a prosperous society by responding to customer requirements and providing semiconductor products and solutions that ensure optimum performance of customers' devices in a timely manner. In addition to this functionality, our semiconductor products are developed by considering their environmental loads as they comply with the various environmental laws and regulations throughout the entire product lifecycle from the design stage to the disposal stage. Therefore, our customers can confidently use these devices.

Meanwhile, the semiconductor manufacturing process consumes a substantial amount of energy because of the high-tech equipment used in the fabrication of fine elements in a clean room where dust is eliminated and an extremely high degree of cleanliness is achieved. In addition, many different chemical substances are used, thus the environmental load from the production activities is quite substantial. Therefore, in our factory, we have proceeded with the active introduction of a production process that is more energy efficient than conventional processes, improved the efficiency of material use, and installed pollution abatement facilities that do not affect the environment in order to realize a smart factory through improvements in the manufacturing equipment using AI to reduce abnormalities.

Furthermore, we have implemented strict self-regulatory standards. These standards are much more strict than government regulations in terms of the waste generated from our factory as we strive to maintain and manage the environment of the local community.

The Renesas Electronics Group will continue supplying high-quality, environmentally friendly products made in clean, highly efficient manufacturing sites. In addition, we are convinced that the technological evolution obtained through the Group's semiconductor devices will directly contribute to the realization of a sustainable society.

This report summarizes the Group's environmental activities and its future outlook. The information provided herein includes the objectives and outcomes of all environmental activities throughout the processes of development, manufacturing, and sales, as well as the use and disposal of our products by the customer. We hope this report will help you understand our environmental activities and establish a better line of communication with you in order to garner more effective environmental activities.

Masahiko Nozaki
Executive Vice President, Environmental Officer

Corporate Outline

Company Name	Renesas Electronics Corporation
Established	November 1, 2002 (Started operation on April 1, 2010 as Renesas Electronics Corporation)
Representative Directors	Tetsuya Tsurumaru, Representative Director, Chairman Bunsei Kure, Representative Director, President and CEO
Major Operations	Research, development, design, manufacture, sale, and servicing of semiconductor products
Headquarters	TOYOSU FORESIA, 3-2-24 Toyosu, Koto-ku, Tokyo 135-0061, Japan
Capital Stock	10 billion yen
Employees (consolidated)	Approximately 20,513 (Consolidated as of December 31, 2017)
Stock Listing	Tokyo Stock Exchange, First Section (Securities Code: 6723)

Renesas Electronics Group Environmental Measures

Stance of the Renesas Electronics Group

Recently, the environmental activities of companies vary from pollution prevention and reductions in greenhouse gases and waste material to compliance with the regulations of chemical substances and hazardous substances contained in products. The Renesas Electronics Group is working to reduce the environmental load from production activities as guided by the common objective of the industry association. We develop and supply environmentally friendly products that help to increase the environmental performance of our customers' products. The annual policies and objectives of these environmental activities are discussed by the Environmental Promotion Committee, which is chaired by the director in charge of environmental operations, and will be announced to the whole group.

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 environmental loads. When environmental problems arise, we will take appropriate steps to minimize the environmental loads 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.

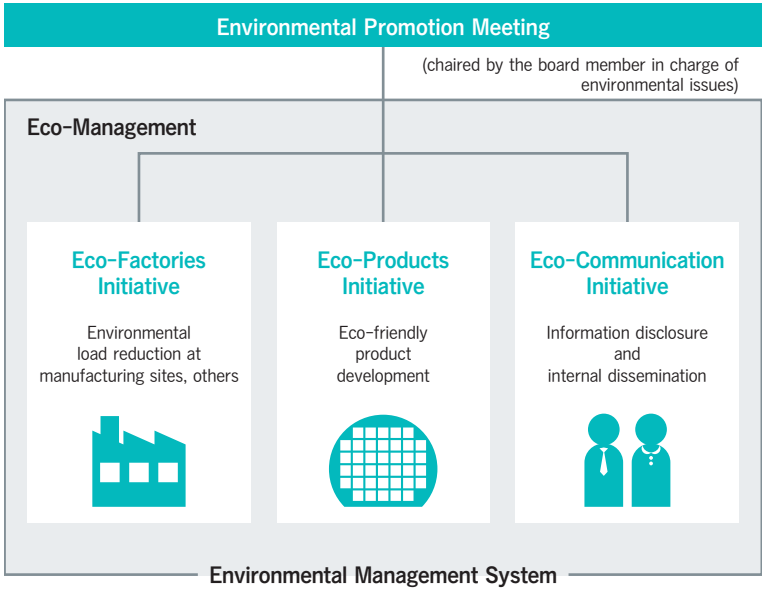
Three Environmental Cornerstones of Renesas Electronics

Some of the key issues for our environmental measures are 1) legal compliance, 2) reduction of our environmental loads, 3) the development of ecofriendly 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 loads 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



Achievements of FY 2017 and targets for FY 2018

Item	Targets for FY 2017	Results of FY 2017	Evaluation	Targets for FY 2018
Eco-Management	●Renew the certification of ISO 14001:2015	●Completed the renewal of integrated domestic certification ISO 14001:2015	◎	●Renew the certification of ISO 14001 Reinforcement administration of the management system
Eco-Factories Initiative	●Reduce 5% or more from benchmark year (Energy consumption per sales)	●Reduced 35% from benchmark year (Energy consumption per sales)	◎	●Reduce 6% or more from benchmark year (Energy consumption per sales)
	●Reduce the PFC*1 emissions from the results of 2015 (units per wafer area)	●Reduced the PFC emissions by 0.028 points from the 2015 emissions (units per wafer area)	◎	●Reduce PFC emissions from the results of 2015 (unit per wafer area)
Eco-Products Initiative	●Address the various domestic and foreign regulations appropriately	●Addressed the various domestic and foreign regulations and self-regulatory substances	◎	●Address the various domestic and foreign regulations appropriately
Eco-Communication Initiative	●Publish an electronic version of the Environmental Report	●Published an electronic version of the Environmental Report in July	◎	●Publish an electronic version of the Environmental Report
	●Provide education for the sales department ●Provide environmental e-learning	●Conducted FY 2017 environmental	◎	●Enhance the materials for position-specific education ●Implement environmental e-learning
	●Continue environmental and social contribution activities	●Implemented activities (Please refer to pages 15 and 16.)	◎	●Continue environmental and social contribution activities

*1 PFC: Perfluoro Compounds: (The semiconductor industry has specified CHF_3, CF_4, C_2F_6, C_3F_8, C_4F_8, SF_6 and NF_3 for emissions reduction.)

The Group's Business Activities and Environmental Footprint

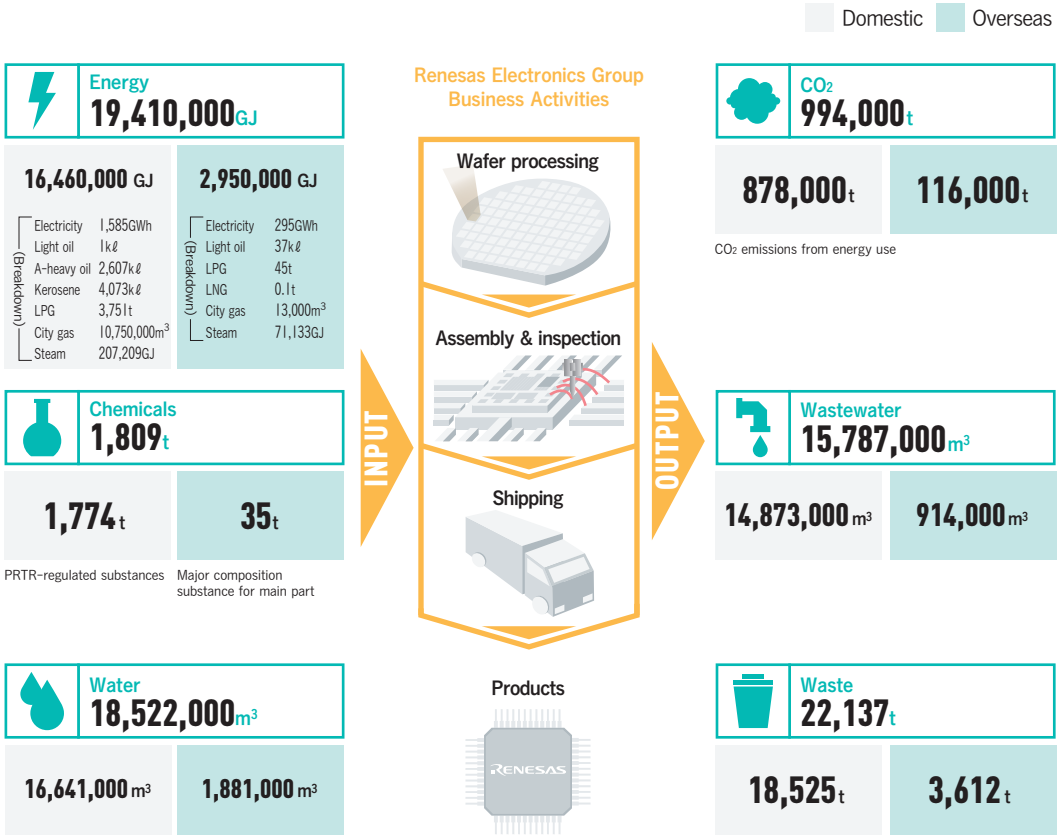
The semiconductor products and solutions offered by the Renesas Electronics Group help our customers make their own products and systems smaller and more energy efficient. This boosts protection of the global environment by helping to prevent global warming and use resources effectively.

On the other hand, it is true that production activities place a large environmental loads. 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 loads 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



*FY 2017: January to December (12 months)

Compliance system for environment related laws and internal audits of the environment management system

The Renesas Electronics Group's Basic Rules of Management set out the Environmental Policy and Basic Rules of Environmental Management. Following these guidelines, all of our bases, including affiliated companies, established their own environmental management system and are proceeding with environmental management activities. Each year, we audited the environmental management system of each base to monitor continuous improvement of performance. In FY 2017, we audited 13 sites including the overseas sites. As a result, 166 recommendations including 45 requests for improvement were extracted, and improvement actions were taken. To maintain highly reliable audits, our audits are conducted by CEAR*1-certified qualified auditors. Furthermore, in response to environmental laws and regulations, which are becoming stricter every year, we constructed an information-sharing system and are monitoring the system and the compliance status of all sites.

Photo of the system audit

Audit for production line

*1 CEAR: Center of Environmental Auditors Registration

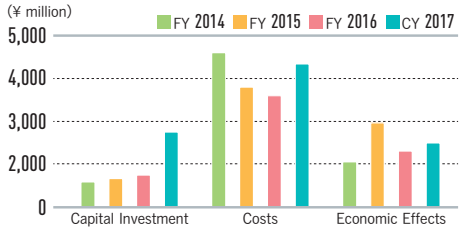
ISO 14001 Certified

All domestic sites and overseas manufacturing sites have been certified under ISO 14001, which is 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 ISO 14001:2015 was completed in FY 2016, and we started new management policies to satisfy the newly revised requirements since the beginning of FY 2017.

Environmental Accounting

Major investments in CY 2017 were made in soil contamination prevention, water pollution prevention, and the renewal of systems for outdoor cooling, noise prevention of cleaning equipment, and waste management systems. We enhanced the efficiency of air conditioning systems and freezers and installed inverters for the different pumps and LED lighting as energy saving measures. The expenses were 526 million yen, 1,520 million yen, and 467 million yen for air pollution prevention, soil and water pollution prevention, and waste disposal, respectively. Among the economic effects, profit on the sale of industrial waste was 546 million yen. The figure does not include the calculated amount based on estimations.

Environmental Accounting Trends



*FY 2014 to 2015: April to March (12 months),
FY 2016: April to December (9 months),
FY 2017: January to December (12 months)

Result of FY 2017

FY 2017: From January 1, 2017 to December 31, 2017

Item		Description	Cost of environmental protection		Effectiveness	
			Investment (million¥)	Expense (million¥)	Economic effect (million¥)	Environmental load reduction
Within business sites	Pollution prevention	Pollution prevention (air, water, etc.)	365	2,084	29	Energy saving 112GWh
	Global environmental conservation	Energy saving measures, global warming prevention, etc.	2,394	1,256	1,750	
	Resource circulation	Efficient use of resources through waste reduction, water saving, recycling, etc.	0	585	726	
Upstream/Downstream		Green procurement, Product assessments, Collection and recycling of packing material	0	0	—	
Management activities		Maintenance, operation, education, etc. of environmental management	8	438	—	
R&D		R&D for reducing the environmental load of products and production process	0	0	—	
Social activities		Donation and support for local community volunteer activity and environmental protection group	0	10	—	
Environmental damage		Cost for compensation concerning soil and groundwater pollution recovery and environmental conservation.	0	4	—	
Total			2,767	4,377	2,505	—

Global Warming Prevention through Energy Conservation

To prevent global warming, the Renesas Electronics group in Japan actively takes part in the energy saving activities of the semiconductor industry. To achieve the target of the electric appliance and electronics industry and the reduction target of the Energy Conservation Act, the group continuously promotes energy conservation activities.

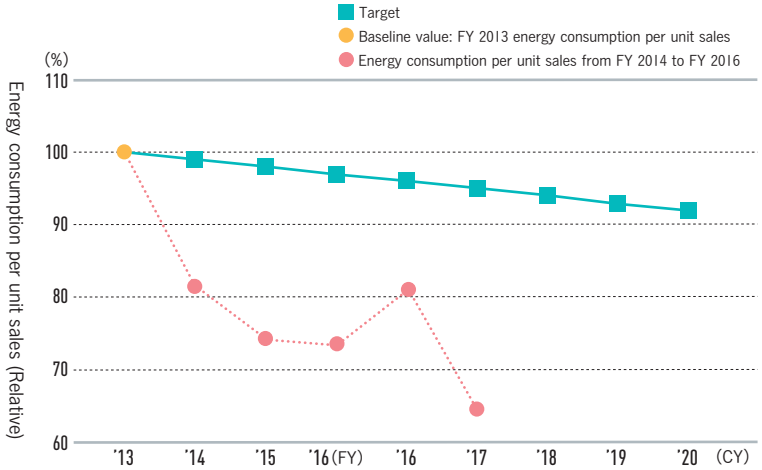
Reducing Energy

The Renesas Electronics group in Japan has participated in the Commitment to a Low Carbon Society, which Japan's electrical and electronics industries has undertaken since FY 2013. As a low-carbon society realization plan, we plan to reduce energy per unit of sales volume by 1% annually by 2020 with reference to the value in 2012. In 2020, the energy will be reduced to 92.27% of the reference value.

Results of FY 2017 Reductions

Energy consumption in 2017 was reduced by 35% from the benchmark year and 16 points from 2016. While the reduction was partly due to increases in production, the effects of energy-saving measures contributed more to greatly reducing energy consumption from the baseline.

Energy consumption per unit sales



* FY 2012 to 2015: April to March (12 months), FY 2016: April to December (9 months), FY 2017: January to December (12 months)

Because the electric power supply is forecast to remain tight in 2018 and beyond, we will continue to actively take measures that focus on energy conservation as we strive to cut CO_2 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, freezers, pumps, and fans under inverter control, as well as replacing freezers, air compressors, chillers, cooling towers, and pumps with energy-saving models. We are also optimizing equipment operation based on our production volume.

Implemented key measures in FY 2017

Considering the effectiveness of energy conservation and investment, we prioritized measures with higher effectiveness. Key measures implemented in FY 2017 are listed below.

- Increased the efficiency of air-conditioning systems
- Made various equipment more power efficient
- Renewed equipment to be more energy-saving
- Suspended facility installation plan

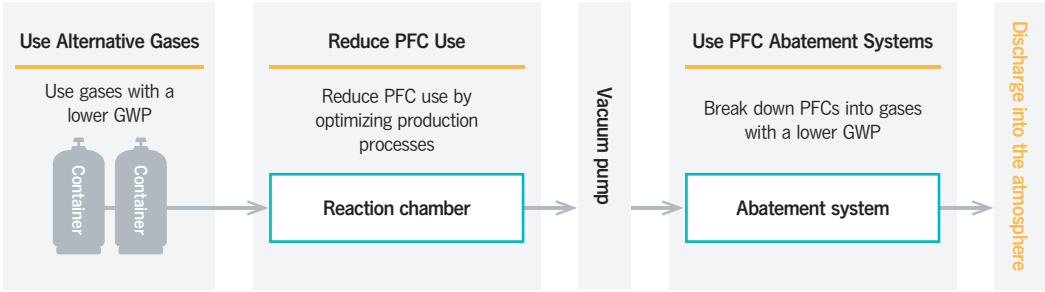
Reducing GHG Emissions

The Renesas Electronics Group uses PFC*1 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*2) 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 2017, we promoted the reduction of greenhouse gas emissions based on previously set targets. The volume of PFC gas emissions per wafer area was reduced by 0.016 points compared to FY 2016, even though there was a difference in production volume. The total amount of emissions was approximately 20% of FY 1995. Emissions of greenhouse gases have been decreasing steadily since FY 2008 because of our continuous reduction activities. We will strive to achieve further reductions in 2018 and beyond.

*1 PFC: Perfluoro Compounds: (The semiconductor industry has specified CHF_3, CF_4, C_2F_6, C_3F_8, C_4F_8, SF_6 and NF_3 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_2=1)

GHG Emissions Reduction Image



PFC Gases and GWP

PFC gas	GWP
CF_4	7,390
C_2F_6	12,200
C_3F_8	8,830
C_4F_8	10,300
CHF_3	14,800
SF_6	22,800
NF_3	17,200

*2006 IPCC Guidelines*3

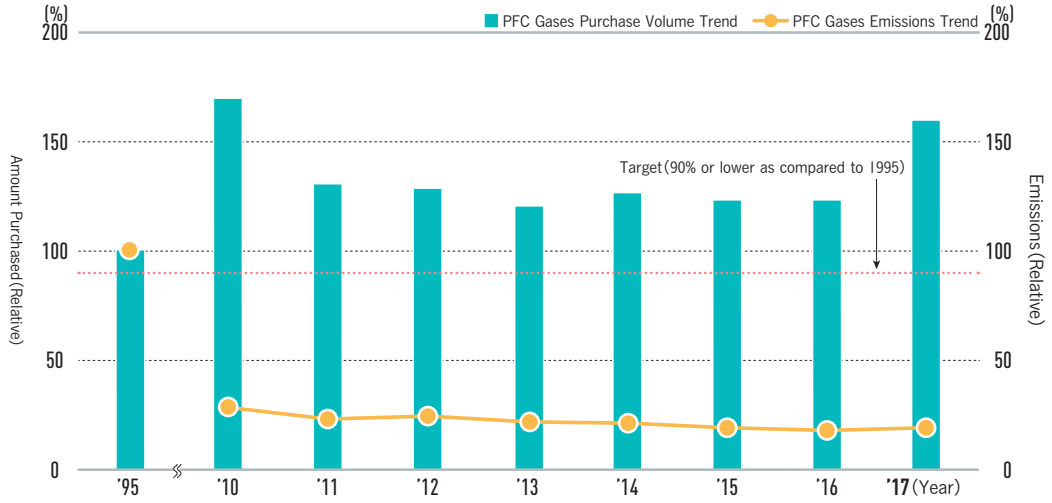
*3 IPCC: Intergovernmental Panel on Climate Change

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_2 (carbon dioxide)	Controlled as CO_2 attributable to energy use
CH_4 (methane)	Not covered
N_2O (nitrous oxide)	Not covered
HFC (hydrofluorocarbon)	CHF_3
PFC (perfluorocarbon)	CF_4, C_2F_6, C_3F_8, C_4F_8
SF_6 (sulfur hexafluoride)	SF_6
NF_3 (nitrogen trifluoride) *4	NF_3

*4 NF_3: Subject to reporting from FY 2016

PFC Gases Purchase Volume and Emissions Trends



*From CY1995 to CY2017: January to December

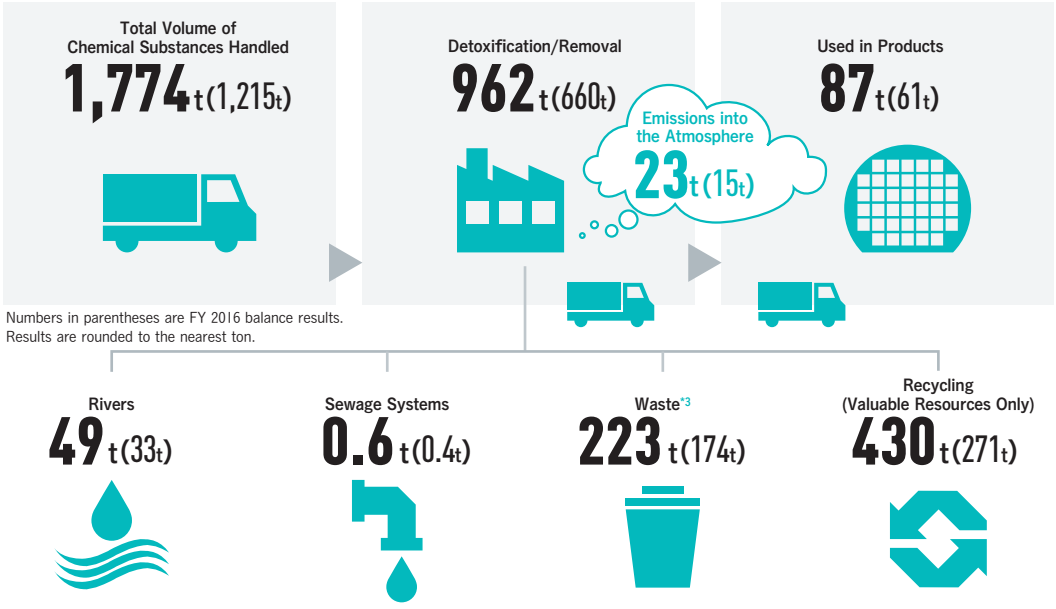
Chemical Substance Management

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*1-regulated chemical substances and VOCs*2 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.

*1 Pollutant Release and Transfer Register Law: (A law concerning the monitoring of emissions of specified chemical substances into the environment and their management)
*2 Volatile Organic Compounds

Input and output of PRTR-regulated Chemical Substances in FY 2017

* FY 2016: April to December (9 months), FY 2017: January to December (12 months)



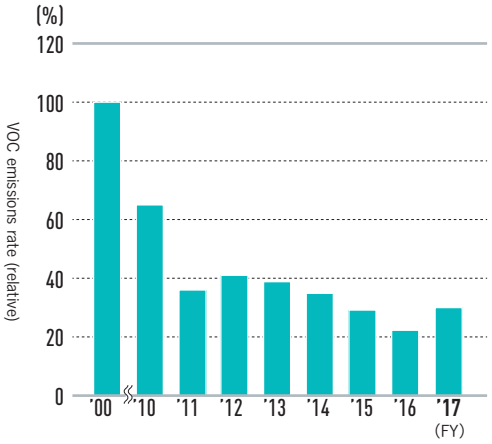
*3 Includes waste for recycling at the Company's expense.

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.

VOC emissions for FY 2017 were reduced to 30% the amount of FY 2000. This showed that our measures so far have produced favorable results. We will actively continue making efforts for further reductions in VOC emissions through the optimization of our fabrication process.

VOC Emissions Trend

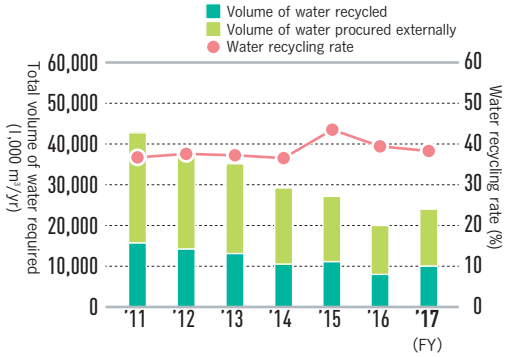


* FY 2000 to 2015: April to March (12 months),
FY 2016: April to December (9 months),
FY 2017: January to December (12 months)

Conserving Water Resources

The Renesas Electronics group in Japan promoted water conservation by recycling and reusing water. The volume of water supplied in FY 2017 was 16,641,000 m^3 and the recycling rate was 37.9%.

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

* FY 2011 to 2015: April to March (12 months), FY 2016: April to December (9 months)
FY 2017: January to December (12 months)

Environmental Measures in Logistics Operations

The Renesas Electronics group in Japan implemented a variety of different environmental measures for its logistics operations. These included energy reduction for the transport of products and waste, reduction of packing materials for products, reuse of packing materials, and the switching of company vehicles to fuel-efficient cars. Pursuant to the Act on the Rational Use of Energy, which stipulates specified consignor obligations, we promoted the reduction of CO_2 emissions in our logistics operations. We will continue our efforts to reduce energy use in logistics operations in FY 2017 and beyond.

Domestic shipping volume

Fiscal Year	Renesas Electronics	Totals for Each Group Company
2013	8.62 million ton-km	5.66 million ton-km
2014	7.65 million ton-km	5.05 million ton-km
2015	6.36 million ton-km	5.02 million ton-km
2016	3.87 million ton-km	2.91 million ton-km
2017	4.72 million ton-km	3.65 million ton-km

* FY 2013 to 2015: April to March (12 months), FY 2016: April to December (9 months)
FY 2017: January to December (12 months)

Waste Management

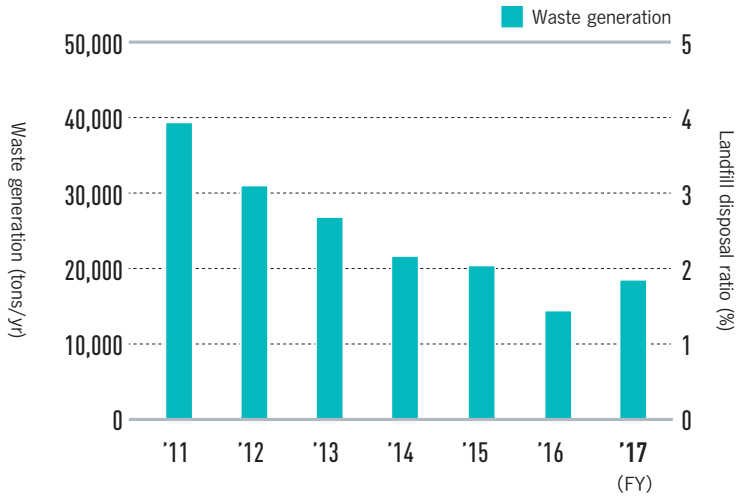
The Renesas Electronics Group in Japan promoted not only the recycling of waste but also the suppression of waste emissions. The emissions in FY 2017 were 18,525 t.

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*1, 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.

*1 PCB : Polychlorinated Biphenyl

Transition of amount of waste



* FY 2011 to 2016: April to March (12 months), FY 2016: April to December (9 months)
FY 2017: January to December (12 months)

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. We will complete the switch to the 2015 version of the Environmental Management System by September 2018.

Examples of Overseas Eco-factory Activities

■ Renesas Electronics Singapore and Renesas Semiconductor Beijing

We promote energy reduction actions at the overseas sales sites as in the case of Japan. At Renesas Electronics Singapore (overseas sales sites), the energy consumption in 2017 was reduced by 14% per employee in comparison with 2016. This is a 110% achievement of the target value. At the factory of Renesas Semiconductor Beijing (overseas production site), the energy consumption in 2017 was reduced by 4% in comparison with 2016.

Examples of Overseas Eco-factory Activities

■ Renesas Semiconductor Malaysia and Renesas Semiconductor Kedah

Renesas Semiconductor Malaysia and Kedah participated in Ride for the Environment & OSH Awareness in School project with SM Technical University. We carried out environmental programs for eco-friendly landscape gardening and raised awareness of our employees about the environment.

Preventing Soil Pollution

The Group is conducting preventive measures for soil pollution. Major actions taken in 2017 are listed below:

- Relocation of an underground tank to the surface on the ground
- Work to prevent permeation of leaked hydrofluoric wastewater into the ground

Example of prevention permeation of leaked chemical into soil (Naka Factory)

On the supposition of chemical leakage at the piping which complies structual requirement of the Water Pollution Prevention Law, in order to reduce of soil pollution caused by leaks from wast water piping, we paved the bare ground below above mentioned piping with concrete in order to prevent toxic substances from permeation into the soil.

Execution of the pollution prevention work

After the pollution prevention work

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 loads 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 loads 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

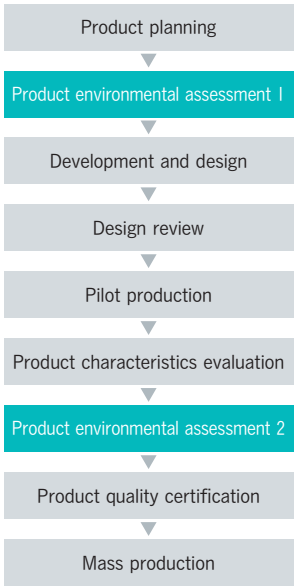
Procurement	Production	Use	Disposal
• Promotion of green procurement by not procuring materials or subsidiary materials that have high environmental loads	• Energy conservation by shortening production process • Managing chemical substances in production site	• Designing energy saving semiconductor devices (e.g. lower power consumption while in standby status) • Designing semiconductor devices that reduce energy consumption by the system when the device is built into the customer's equipment.	• Eliminating specified chemical substances • Reducing waste through reductions in the size and weight of products

Creation of Eco-Friendly Products

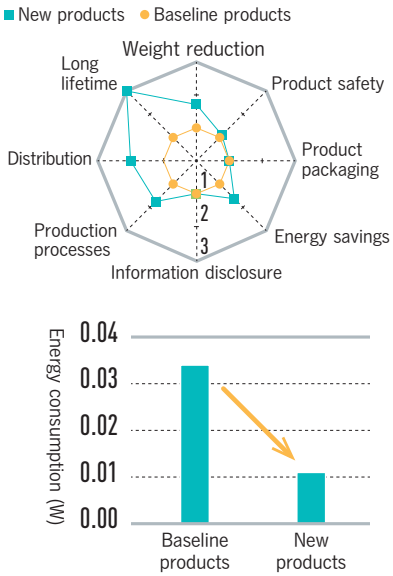
As a way to create eco-friendly products, we include a product environmental assessment, a way of evaluating how much a project mitigates environmental loads, into our development and design flow. The evaluation compares new products against old ones in eight categories, including volume reduction, product 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 loads of the customers who use those products.

Information about eco-friendly products (Eco-Products Initiative)
https://www.renesas.com/en-hq/about/company/csr/ecoproduct.html

Flowchart of Development and Design of General Semiconductor Device



Product Environmental Assessment Results Chart and Energy Consumption Comparison



Renesas Green Device

The Renesas Green Device is internally certified as a product with an assessed environmental performance above the set criterion level. Products with higher environmental performance are selected and certified as Renesas Super Green Devices. The Renesas Green Devices and Renesas Super Green Devices selected from hundreds of newly developed products every year are registered in our database. Some of these products are presented on our website with an environmental performance index.

Introducing Renesas Super Green Devices for the public

Environment-friendly products (Eco-products activity)
https://www.renesas.com/en-hq/about/company/csr/ecoproduct.html

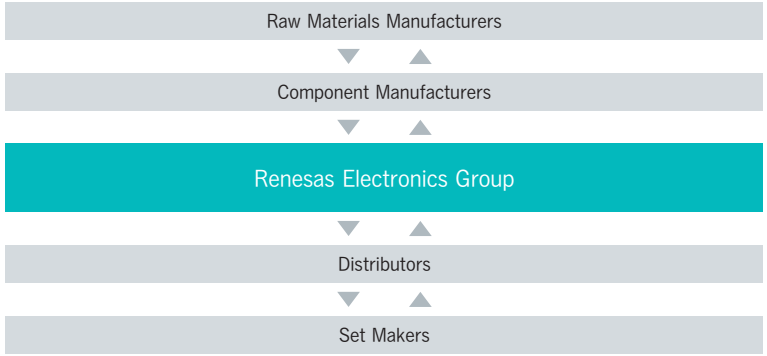
Product name	Type	Application	Environmental performance	Feature
RJH65T14DPQ	IGBT + Fast recovery diode	High power control such as IH	★★★★	Realizing miniaturization by packaging both IGBT and fast recovery diode in one body
RJE0620JPD	High performance power MOSFET (Thermal FET)	Power switching	★★★★★	Realizing both high performance and miniaturization with built-in overheat cutoff circuit
R5FIIAG series	General purpose low-end MCU	Bluetooth Low Energy	★★★★	Reduced power consumption for input/output in half, and enabling downsizing of board by eliminating external parts
NP30N04QUK	Power MOSFET for low-middle power	Switching Car mounted ECU control	★★★★	Mounting Dual chip and miniaturizing system configuration 50% in size
R7S721000VLFP	Display control (Camera, Network, Voice) MCU	Display control	★★★★★	Eliminating DRAM on peripheral components Enabling miniaturization of module board size Enlarging internal memory size
RAJ240500A20DNP	Charge and discharge control, Current monitoring function mounted MCU	Monitoring and controlling Lithium ion secondary battery	★★★★	Optimizing battery efficiency by integrating all necessary features in one package, realizing miniaturization for a lightweight device
RBA80N04AHWAUH01	Power MOSFET for low-middle power	Switching Car mounted ECU control	★★★★★	Improved function with built-in temperature sensing diode Reducing power consumption by 20% by low ON resistance
R8A77920DA01BG	Onboard camera image recognition and processing SoC	For image processing (image input, and distortion recognition and correction)	★★★★★	Expansion of the functions, such as an increase of inputs, downsizing, and reduction of a power consumption by 30% or more
R7F701383EAFP	RH850 onboard RISC MCU	For safety of a chassis and automatic operation control	★★★★	Upgrading of the existing functions such as the advanced safety and security functions and various interfaces
R7F7015874AFP-C	RH850 onboard 32-bit MCU	For automobile electronic parts	★★★★★	Smaller unit with the same performance, reduction of a power consumption by 48% or more

Environmental performance (indicator) ★～★★:Renesas Green Device
★★★～★★★★★:Renesas Super Green Device

Product Environmental Quality

To customers, we provide information on substances contained in our products and analysis data on the substances prohibited by the Restriction of Hazardous Substances (RoHS)*1 at the request of customers to ensure that our products can be used safely. Moreover, we offer opportunities to check our chemical substances control system and actual environmental protection activities. We think that chemical substances used in all processes from selection of materials at development and design phases to pollution prevention in the manufacturing processes must be controlled by the whole supply chain. To suppliers, we ask them to submit a certificate and analysis data to ensure that the prohibited substances are not used. Additionally, we perform supplier audits to check their control systems. To distributors and special agents, we request them to control chemical substances contained in packaging materials.

Product Chemical Content Control throughout the Supply Chain



Provision of the information on substances contained in our products and the analysis data on the substances prohibited by the RoHS

*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).

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 and other laws and regulations.

About Green Procurement
https://www.renesas.com/en-hq/about/company/csr/green.html

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 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 and the ELV Directive*1 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 **ELVDirective:**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 Restrictions on the Use of Hazardous Substances in Electrical and Electronic Products, also known as Amendment China RoHS, requires an indication of the hazardous substance used and the product Environment Friendly Use Period (EFUP) for end products that contain specified 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#chinarohs

Initiatives in Europe

Renesas Electronics is not required to register its semiconductor devices under the EU's REACH Regulation*2, since they are articles (finished products) that do not intentionally emit chemical substances. However, we obtain the products containment information related to substances of very high concern (SVHCs*3) 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.

*2 **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.

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

Communication with Local Residents

Yonezawa Factory of Renesas Semiconductor Package & Test Solutions Co., Ltd., donated a wheelchair to Yonezawa Technical High School on April 25, 2017. This activity has continued since 2001. The employees of the Yonezawa factory collect collect aluminum cans no longer in use at home to exchange 500 kg of the collected cans with an aluminum wheelchair, and sequentially donate the wheelchair to neighboring hospitals and welfare facilities. This is the 11th donation of the wheelchairs.

Our cleaning activities with local residents in 2017 are as follows:

- Oita Factory : Cleaning of Oshinden beach (June and October)
- Saijyo Factory : Cleanup walking (November)
- Yamaguchi Factory : Cleaning of Arihogawa River (November)
- Renesas Electronics Singapore : International Coastal Cleanup ICCS-2017 (October)

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 19011 education programs help employees understand the certification systems and help internal auditors develop their auditing skills.

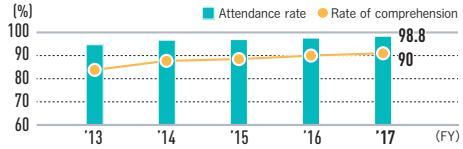
Renesas Electronics Environmental Education System

Program	Purpose	FY 2018 target
General Environmental Education	Raising the environmental awareness of employees	• Basic environmental education (for all Group employees) • Position-specific education (new employees/new leaders/new managers)
Specialized Environmental Education	Gaining environmental knowledge required for operations	• Environmental education for the development, design, and sales divisions • Environmental education for sales strategists • Environmental education for manufacturing divisions
(ISO14001・ISO19011 Education)	• Understanding the ISO 14001 and the ISO 19011 certification system • Developing the skills of internal auditors	• Basic ISO 14001 education • ISO 19011 education • Internal auditor education

FY 2017 Achievement

We provided general education about the latest environmental problems and the environmental laws and regulations for new manager and superviser and the staff of the sales divisions. Additionally, we provide environmental basic education (online sessions : e-learning) to all employees of Renesas Electronics Group. Therefore, from the start of the basic education in 2011, the number of participants has increased year after year partly because many employees aim to complete the education as part of their environmental activities assigned by their division or department. We check the effectiveness of this education by questionnaire to the participants and feed back the result to educational materials.

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



Comments from Environmental Education Participants

- I thought it was necessary to take immediate action against environmental issues that seriously influence our daily life. I would like to make a contribution to environmental protection by promoting familiar ecological activities.
- I once again realized the serious situation of the global warming issue. Even though a single person's ability is limited, it is necessary for the whole company to unite and contribute to environmental protection.
- The contents of the training session were based on our current reality, for example, it includes the Paris Agreement and so on. So it was very helpful. My understanding of the importance of biodiversity has deepened.
- For the children of the next generation, I thought it is necessary to seriously consider the preparation for the future where there is exhaustion of fossil fuels.

Biodiversity Conservation Activities

Yamaguchi Factory of Renesas Semiconductor Manufacturing Co., Ltd., conducts investigations of benthic organisms in the Arihogawa River and bird population surveys as part of biological diversity protection activities. At the request of Ube City, they participated in Biological Diversity Civil Conference held by Ube City on February 24, 2017 as a panelist.

At the 10th conference of the Convention on Biological Diversity (COP10), the Aichi Target (2020 target) was adopted. We registered the biological diversity protection project, Nijumaru Project*, as a member and declared contribution to the biological diversity protection (Nijumaru Declaration).

Photo of the Biological Diversity Civil Conference

* Nijumaru Project performed by Japan committee for IUCN (IUCN-J). ("Nijumaru" means "excellent").

Website of the Nijumaru Project
http://bd20.jp/

Participation in Environmental Reporting Platform Development Pilot Project

The Environmental Reporting Platform Development Pilot Project is a project designed by the Ministry of the Environment in response to the increasing demands for disclosure of information on Environment, Society and Governance (ESG) . We have participated in this project since 2015 and make efforts to disclose the environmental information properly.

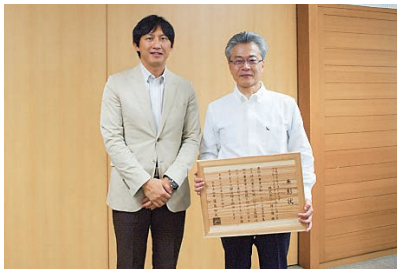
Forest Preservation Activities

The Group conducts forest conservation activities in various places. In 2017, the Kumamoto Kawajiri Factory received a certificate for 42.29 tons of CO2 offsets.

Award

Nishiki Factory of Renesas Semiconductor Package & Test Solutions Co., Ltd., received a contributing company reduction of greenhouse gas emission award from Kumamoto Prefecture. This award was established by Kumamoto Prefecture in 2017 to promote the environmental protection activities. Through the examination of 305 companies, the Nishiki Factory won the award on July 14, 2017 as the first winner.

Website of Kumamoto Prefecture
http://www.pref.kumamoto.jp/kiji_20668.html



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.

Website of Hitachinaka City
https://www.city.hitachinaka.lg.jp/material/files/group/18/runesasuH28.pdf

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

Otsu City Environment Division website
http://www5.city.otsu.shiga.jp/kankyou/content.asp?key=0120110303&skey=0

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

Third Party's Opinion on Our Environmental Report 2018

It is necessary to raise awareness of all employees about Sustainable Development Goals (SDGs).

I highly rate the Renesas Electronics Corporation for setting Sustainable Development Goals (SDGs) as daily environmental activities. However, there are some points to be improved, I would like to point out to them on this occasion in expectation of further promotion of the activities. In the beginning, I will discuss your ecomanagement. The figure on page 3 , Three Elements of Environmental Activities, shows that the eco-management consists of three major elements of eco-factory activities, eco-product activities, and eco-communication activities.

In this report, you said that you researched and developed chemical substance control as part of the eco-factory activities. However, the table on other page shows that the investment in the research and development to reduce environmental loads of products and manufacturing processes is 0. I think you should review this point.

Second, I will discuss the eco-product activities. With this report, I can see that you reduce the environmental loads through improvements. I agree that improvement is an important activity. However, it would be difficult to reduce all environmental loads produced through various processes from procurements of materials to disposal of waste simply by making improvements. I think that a positive investment in the research and development to reduce the environmental loads of products and manufacturing processes is indispensable to evolving eco-friendly technologies. As for the eco-communication activities, I think the environmental education to attain the SDGs may be insufficient. To attain the goals, it is essential to be aware the significance of the SDGs. From this viewpoint, environmental education is very important and the relationship between the SDGs and the education should be clarified.

Each report of the eco-factory activities, eco-product activities, and eco-communication activities are comprehensive. However, the reports do not describe how these activities interact with each other, what issues remain, and how to develop these activities in future. If these points are contained in the reports, they could be better.

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Tomohisa Ueda

Doctor of Business Administration. He researches and investigates the establishment of environment-production integrated systems in the semiconductor industry to promote a sustainable society.