

Environmental Report 2014



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Environment

Taking definitive action today, to create a greener world tomorrow.

Looking ahead to our 100th anniversary in the year 2021, we aim to become a global, leading green company. We're working toward the creation of a low-carbon, recycling-based society by applying our wide-ranging and advanced technologies, as well as through ongoing actions by our employees.

From the President



True Dedication to Environmental Management

Chinese language version of the above page:

- ▶ 中文

Basic Policy and Approach to Environmental Management

Learn more about our policies, vision and management initiatives as we strive to be a global, leading green company.

- ▶ Group Environmental Policy
- ▶ Environmental Statement: Eco Changes
- ▶ Environmental Vision 2021
- ▶ Aiming to Become a Global Leading Green Company
- ▶ Environmental Management
- ▶ Environmental Plan
- ▶ Product Environmental Data
- ▶ Procurement
- ▶ Respecting Biodiversity

Environmental Report 2014

- ▶ Targets and Achievements of the 7th Environmental Plan (Fiscal 2013-2015)
- ▶ Important Issues in Environmental Management
- ▶ Environmental Considerations for Value Chain Management
- ▶ Data & Charts in Fiscal 2014
- ▶ Initiatives toward Creating a Low-Carbon Society
- ▶ Initiatives toward Creating a Recycling-Based Society
- ▶ Managing Chemical Substances
- ▶ Development of Environmental Technologies
- ▶ Environmental Communication

Chinese language version of Targets and Achievements of the 7th Environmental Plan:

- ▶ 第7次环境计划(2012-2014年度)目标与成果

The Environment and Business

Read about the activities and priority environmental issues of each business group, including key policies, initiatives and the contributions that our long-term strategic products are making to the environment and society.

Environmental Topics



We've highlighted some outstanding examples of leading environmental initiatives for a sustainable society.

- ▶ New Energy Potential — A Wireless Sensor Powered by Small Vibrations
- ▶ Plastic Recycling Comes of Age
- ▶ Tapping into Hidden Deposits of Rare Earth Elements Found in Cities
- ▶ Kyoto Works Becomes Home to a Family of Ducks
- ▶ Water for Life, Water for Industry
- ▶ Archives

Environment Site Map

Use this sitemap for an overall view of our extensive environmental activities.

Environmental Sustainability Report

- ▶ Environmental Sustainability Report 2014
- ▶ 环境行动报告 2014

CSR Related Information

- ▶ About the Report
- ▶ Back Issues

Topics

New Energy Potential



In 2012, Mitsubishi Electric Engineering Co., Ltd. developed a sensing system that generates electric power utilizing the minor vibrations.

- ▶ New Energy Potential — A Wireless Sensor Powered by Small Vibrations

Recycling Rare Earth Magnets from Air Conditioners



Mitsubishi Electric Group developed a system that can efficiently recover rare earth magnets used in the compressors of household room air conditioners and began recycling this precious commodity.

- ▶ Tapping into Hidden Deposits of Rare Earth Elements Found in Cities

Eco Changes: An Introduction




An overview of Eco Changes and how we're helping create a greener tomorrow.


- ▶ Watch Video 

Features




The information hub for environment-related activities of the Mitsubishi Electric Group. 



Discover some of the ways we're changing the environment for the better. 



A report detailing Mitsubishi Electric's environmental performance and policies in the past fiscal year. (PDF: 1.4MB) 

CSR – About the Report

About the 2014 CSR Report

This report provides information about corporate social responsibility (CSR) initiatives by the Mitsubishi Electric Group to help realize a sustainable society. It primarily reports on significant activities, events and changes that occurred in fiscal 2014 (year ending March 31, 2014). Based on the PDCA (plan-do-check-act) approach, in reporting our activities, we tried to go beyond just presenting our principles and the results of activities to date in order to also refer to future policies and issues.

We endeavor to fulfill our responsibility of presenting information to the public in order to broaden our range of communication with stakeholders. We appreciate any and all frank and honest feedback intended to further improve the report.

Structure of the Report

Aiming to fulfill our responsibility of presenting information to the public, the report consists of and discloses information in four main sections of content: CSR Policy, CSR Report, Environment, and Philanthropic Activities. In particular, the CSR Report section reports on our responsibility and conduct toward stakeholders.

The Environment section introduces our activities grounded in Environmental Vision 2021 and a number of unique initiatives expected of a global, leading green company. It also provides easy-to-understand explanatory animated content about our environmental technologies.

Period Covered by the Report

April 1, 2013 – March 31, 2014

* Also includes some information on policies, targets and plans occurring after the close of fiscal 2014.

Scope of the Report

Social Aspects	Primarily covers activities of Mitsubishi Electric Corporation * The range of data compiled is noted individually.
Environmental Aspects	Covers the activities of Mitsubishi Electric Corporation, 116 domestic affiliates, and 73 overseas affiliates (total of 190 companies). * Click here for details.
Economic Aspects	Primarily covers performance of Mitsubishi Electric Corporation, consolidated subsidiaries, and equity method affiliates * Detailed information on economic performance is provided in the Investor Relations site.

References

- Environmental Reporting Guidelines (2012), Ministry of the Environment
- Business Owner Environmental Performance Indicator Guideline (2002), Ministry of the Environment
- Environmental Accounting Guidelines (2005), Ministry of the Environment
- Environmental Reporting Guidelines 2001—With Focus on Stakeholders, Ministry of Economy, Trade and Industry
- Sustainability Reporting Guidelines Version 3.1, Version4, Global Reporting Initiative

Regarding Future Projections, Plans and Targets

This report contains not only statements of past and present fact related to Mitsubishi Electric Corporation and its affiliates (Mitsubishi Electric Group), but also future projections, plans, targets and other forward-looking statements. Such projections, plans and targets constitute suppositions or judgments based on information available as of the time they are stated. Future business activities and conditions may differ from projections, plans and targets due to changes in various external factors.

The Mitsubishi Electric Group conducts business in the form of development, manufacturing and sales in a broad range of areas, and these activities take place both in Japan and overseas. Therefore, the group's financial standing and business performance may be affected by a variety of factors, including trends in the global economy, social conditions, laws, tax codes, litigation and other legal procedures, etc. We would ask readers to keep these points in mind when reviewing this report.

References

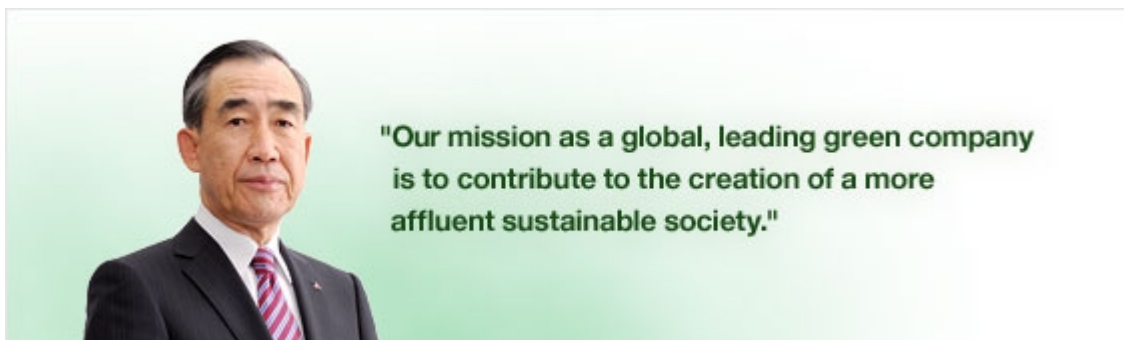
- Environmental Reporting Guidelines (2012), Ministry of the Environment
- Business Owner Environmental Performance Indicator Guideline (2002), Ministry of the Environment
- Environmental Accounting Guidelines (2005), Ministry of the Environment
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Environment – From the President



The "Affluent Society" That the Mitsubishi Electric Group Aims to Realize

The Mitsubishi Electric Group is committed to Environmental Vision 2021, which sets 2021—the 100th anniversary of Mitsubishi Electric's founding—as the year for reaching the Group's targets. Based on this vision, our aim is to grow as a global, leading green company that contributes to creating a more affluent society. We recognize the need to consider the global environment in all activities, and so "more affluent society" means to us not only that people around the world live contentedly and in comfort, but also that we have achieved a sustainable society in which diverse forms of life coexist.

We clarified three pillars of action in Environmental Vision 2021: "creating a low-carbon society," "creating a recycling-based society," and "respecting biodiversity." Amidst the critical global issue of the dwindling supply of fossil fuels, minerals, water, and other resources, our mission is to provide customers worldwide with products high in energy- and resource-efficiency, thereby effectively utilizing limited resources. At the same time, we must implement initiatives based on the three pillars in all business activities, including but not limited to material procurement, manufacturing, and delivering products to our customers.

Exercising Our Comprehensive Strength to Contribute to Creating Low-Carbon Societies

The amount of CO₂ emitted due to the use of a product is far greater than the amount of CO₂ that is emitted during the manufacturing of that product; in fact, the former amount is several dozen times greater than the latter, according to our calculations. That is why we are making efforts in all business fields to develop products that not only function well, but also have higher energy efficiency, thereby emitting less CO₂ when used.

Promoting the widespread use of our high value-added products throughout society is also important. For example, in emerging countries with rapidly expanding economies and marked population growth, we must respond to increasing energy demand and reduce environmental impact at the same time.

In a wide range of fields, from in the home to outer space, the Mitsubishi Electric Group provides products that help customers reduce their environmental impact, and offers total solution services that contribute to resolving customers' issues. Fully leveraging our high technological prowess and comprehensive strength, we seek to contribute even further to creating low-carbon societies in various countries and regions.

Aiming to Enhance Global Performance by Demonstrating Our True Strengths

The Mitsubishi Electric Group is engaged in global environmental activities and is making efforts to build global value chains that extend not only Group-wide, but also include other suppliers and retailers in Japan and overseas. To this end, simply complying with environmental laws and regulations in each country and region is not sufficient. Rather, the environmental technologies, expertise, and know-how we have carefully cultivated need to be applied globally.

When mentioning "low-carbon," there is a tendency to focus solely on CO₂. However, SF₆ gas, which is said to have a global warming potential approximately 24,000 times that of CO₂, is widely used both as an insulating medium in certain power devices and in the production of semiconductors. The Mitsubishi Electric Group is leading the industry in efforts to prevent leakage during production and recover the gas as well. By proactively adopting similarly advanced initiatives at overseas sites, we will continue to further improve our performance at the global level.

There are various restrictions depending on the country and region, and there are many challenges facing us as we work to execute our initiatives. Even so, I am confident that we will be able to utilize our advanced technological strength and vast experience to overcome these challenges, taking our environmental performance in global value chains to an even higher level.

Taking a Step Forward from the Status Quo in Pursuit of "New Affluence"

When it comes to work, I believe that people should first of all improve their skills while performing their professional duties. Then, once people have reached a certain level of proficiency, I think that it is important for them to be motivated to break new ground—on their own accord—and rise to the next level.

For the Mitsubishi Electric Group, rising to the next level means allowing the "more affluent society" that I mentioned above to advance into a new dimension. In other words, it means "to create a society where people live more affluently without sacrificing the Earth's resources or biodiversity." In the same way that people who learn through work go on to break new ground and rise to the next level, our initiatives should pursue "new affluence." To accomplish this, I believe that we ourselves must achieve new growth and development.



Masaki Sakuyama
President & CEO

Environment – Environmental Report 2014

Targets & Achievements of the 7th Environmental Plan (Fiscal 2013-2015)

An overview and self-evaluation of progress and achievements made by the Mitsubishi Electric Group in fiscal 2014 in comparison to the targets set out in the 7th Environmental Plan.

Chinese language version of the above page:

- ▶ 第7次环境计划(2012-2014年度)目标与成果

Environmental Considerations for Value Chain Management

A list of initiatives for each process in the value chain.

Initiatives toward Creating a Low-Carbon Society

- ▶ Reducing Greenhouse Gases Emitted in the Value Chain
- ▶ Reducing CO₂ from Product Usage
- ▶ Expanding Our Contributions to Reducing CO₂ from Product Usage
- ▶ Reducing CO₂ from Production
- ▶ Reducing Emissions of Non-CO₂ Greenhouse Gases
- ▶ Reducing CO₂ from Logistics

Managing Chemical Substances

Report on the status of chemical substance management under our own Chemical Substance Management System.

Important Issues in Environmental Management

Read about the Mitsubishi Electric Group's importance evaluations and management approach for each environmental aspect.

Data & Charts in Fiscal 2014

- ▶ Period and Scope of the Report
- ▶ Material Balance
- ▶ Environmental Accounting
- ▶ Environmental Performance Data
- ▶ Awards

Chinese language version of two of the above pages:

- ▶ 关于报告期间与范围
- ▶ 物料衡算

Initiatives toward Creating a Recycling-Based Society

- ▶ Reducing Use of Resources
- ▶ Recycling End-of-Life Products
- ▶ Initiatives toward Zero Final Waste Disposal Ratio
- ▶ Reducing the Use of Disposable Packaging Materials
- ▶ Using Water Effectively

Development of Environmental Technologies

Overview of the results of R&D activities for products and services that contribute to environmental conservation.

■ Environmental Communication


- ▶ Disclosure and Dissemination of Environmental Information
- ▶ Mitsubishi Electric Outdoor Classroom


Environment – Targets and Achievements of the 7th Environmental Plan (Fiscal 2013–2015)



Targets and Achievements of the 7th Environmental Plan (Fiscal 2013–2015)

 Very good
  Good
  Almost there
  More effort needed




Initiatives Toward Creating a Low-Carbon Society


Reducing CO2 emissions from production				
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Fiscal 2013	Progress in fiscal 2014		
	Target	Target	Results	Self-evaluation
Improve CO2 emissions per unit of sales to 83% in comparison to fiscal 2011 (▲17%)	96%	86%	90%	

Reducing non-CO2 greenhouse gases		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Reduce non-CO2 greenhouse gases (SF6 PFC HFC) by 70% in comparison to fiscal 2006	Achieved target with a 78% reduction (Japan)	


Contribution to reducing CO2 emissions from product usage		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Reduce CO2 emissions from product usage by improving product performance: average reduction rate for 84 products: 27%* *Weighted average calculation of all relevant products.	Achieved average reduction rate of 33% for 110 products	
Increase amount of contribution to reducing CO2 emissions from product usage	Contributed to reduction of 28.20 million tons of CO2 for 99 finished products and 66.49 million tons of CO2 for 31 intermediate products	



Initiatives Toward Creating a Recycling-Based Society



Final disposal ratio			
Targets of 7th Environmental Plan (Fiscal 2013–2015)		Progress in fiscal 2014	Self- evaluation
Mitsubishi Electric	Less than 0.1%	0.001%	
Affiliates (Japan)	Less than 0.1%	0.09%	
Affiliates (Overseas)	Less than 1.0%	1.04%	


Reducing use of resources			
Targets of 7th Environmental Plan (Fiscal 2013–2015)		Progress in fiscal 2014	Self- evaluation
In comparison to fiscal 2001, average reduction rate for 64 products: 39%		Average reduction rate for 64 products: 35%	

Strengthening Our Environmental Management Foundation

Prevention of environmental accidents		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Prevention of environmental accidents	No accidents occurred	


Reduction of environmental liabilities		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Appropriate storage and treatment of PCB waste and devices containing PCB	Completed waste treatment on 179 machines as planned	
Purification of groundwater and soil contamination	Evaluated results and countermeasures based on investigation of soil and groundwater conditions associated with land-use: out of 14 cases for Mitsubishi Electric and 9 cases for affiliate companies, all cases were confirmed to have been handled appropriately	

Training of environmental personnel		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Training of key environmental personnel	Conducted training of key environmental personnel for those newly appointed to environmental management departments in Japan and environmental personnel in Thailand	
Promotion of environmental awareness and harmony with the community and nature	Held 36 Mitsubishi Electric Outdoor Classrooms in 32 regions and trained 40 Outdoor Classroom leaders	

Publicity and advertising about environmental contribution		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Publicity and advertising about environmental contribution	Disclosed environmental information via website and leaflets; expanded environmental communications worldwide; continued corporate advertising series (Global Eco Changes) to deliver information about Mitsubishi Electric's environmentally advanced technologies/products globally	

Expanding Environment-Related Businesses

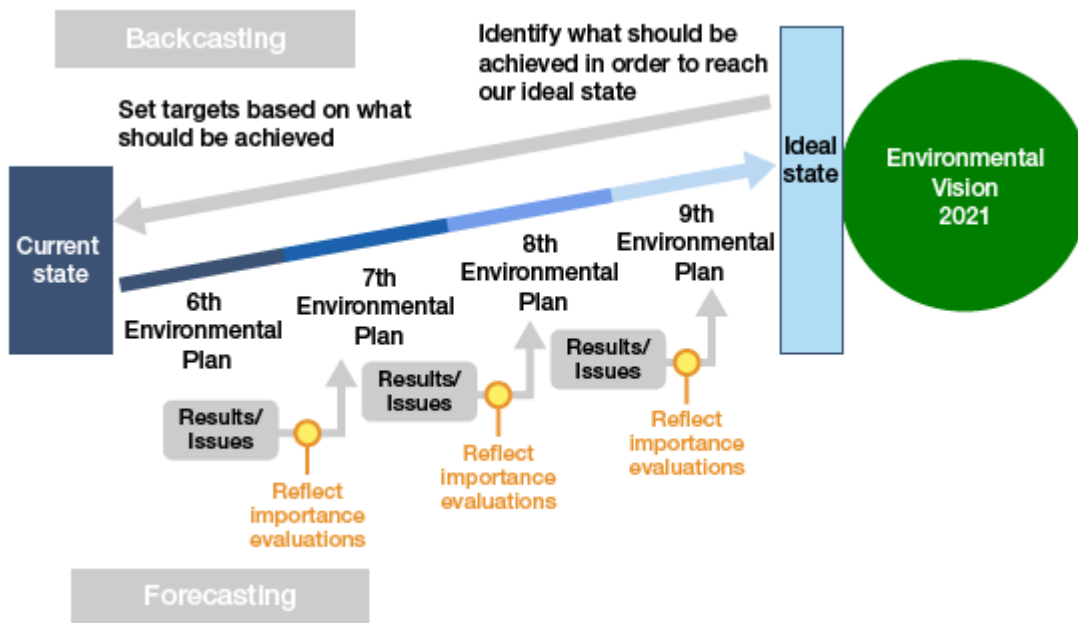
Expansion of environment-related businesses		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Expansion of environment-related businesses	Expanded the development of businesses that have received various product-related awards, including room air conditioners, heat exchangers and ventilation systems for Europe, centralized controllers for refrigeration facilities, highly efficient three-phase motors, etc.	

Creation of products with highly innovative environmental features		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2014	Self-evaluation
Creation of products with highly innovative environmental features: have each business unit select one or more products	Engaged in originating innovative product development as evidenced by one of our room air conditioners winning the Grand Prize for Energy Saving Product in the Eco-Product Awards as well as the Chairman's Award from the Energy Conservation Center, Japan	

Environment – Important Issues in Environmental Management

Environmental Plan and Environmental Vision 2021

The Mitsubishi Electric Group prepares an environmental plan every three years. Every item (target) in the plan is geared towards achieving the goals of Environmental Vision 2021, which is based on three pillars: "creating a low-carbon society," "creating a recycling-based society" and "respecting biodiversity and fostering environmental awareness." Targets are set using both backcasting and forecasting based on the achievements and issues of the previous environmental plan. In this way, throughout the plan drafting process, we evaluate both "importance to society" and "importance to the Mitsubishi Electric Group." For the 8th Environmental Plan, which will start from fiscal 2016, we also plan to include evaluating "importance from the perspective of external stakeholders."



Environmental Initiatives and Indicators Based on the Environmental Plan

In the 7th Environmental Plan (fiscal 2013~2015), management items accompanied by numerical targets include "reducing CO2 emissions from production," "reducing non-CO2 greenhouse gases," "initiatives toward zero final waste disposal ratio," "reducing CO2 from product usage" and "reducing the influx of resources." These five items are set from the perspectives of management and environmental impact. Of these items, we view reducing CO2 emissions from production and from products and services, which relate to mitigating the environmental impact that contributes to climate change, as high-priority indicators for business activities in terms of both importance and frequency.

Our management approach for each environmental aspect of the Global Reporting Initiative (GRI) Guidelines Ver. 4 (G4)* and explanations corresponding to each aspect (details page) are shown in the table below.

* GRI Guidelines Ver. 4 (G4): International guidelines relating to sustainability and reporting. Version 4, published in May 2013, is the latest version.

G4 environmental aspect and management approach	Indicators	
Materials	G4-EN1	MATERIALS USED BY WEIGHT OR VOLUME
	G4-EN2	PERCENTAGE OF MATERIALS USED THAT ARE RECYCLED

In business activities and transportation at factories and offices, the Mitsubishi Electric Group procures

and uses various common/rare metals, petroleum-derived resins, electric energy, fuel, water and wood resources. For effective utilization towards preventing the depletion of limited resources, high priority is given to reducing the influx of resource and promoting initiatives to realize zero final waste disposal ratio (maximum reuse of waste generated from production), as well as managing these initiatives with respective numerical targets.

Energy	G4-EN3	ENERGY CONSUMPTION WITHIN THE ORGANIZATION
	G4-EN4	ENERGY CONSUMPTION OUTSIDE OF THE ORGANIZATION
	G4-EN5	ENERGY INTENSITY
	G4-EN6	REDUCTION OF ENERGY CONSUMPTION
	G4-EN7	REDUCTIONS IN ENERGY REQUIREMENTS OF PRODUCTS AND SERVICES

Electricity is the main form of energy used in the production activities of the Mitsubishi Electric Group. In processes that directly use heat energy, we also use fuels such as gas and petroleum. To prevent the depletion of energy resources, efforts are underway to improve the energy consumption efficiency of production lines and utilities. We're also expanding the introduction of demand management and photovoltaic power generation in order to reduce consumption.

To reduce energy consumption during product usage, we're developing products high in energy efficiency and focusing on increasing their use throughout society. In area of transportation (i.e., sales distribution), by improving loading ratios that enable us to reduce the number of trucks on the road, we are making progress in reducing energy consumption.

- Through improving energy consumption efficiency and reducing consumption, we are working to reduce CO2 emissions. The Mitsubishi Electric Group uses "CO2 emissions per unit of sales" as an important indicator. For details, please see "Emissions."

Water	G4-EN8	TOTAL WATER WITHDRAWAL BY SOURCE
	G4-EN9	WATER SOURCES SIGNIFICANTLY AFFECTED BY WITHDRAWAL OF WATER
	G4-EN10	PERCENTAGE AND TOTAL VOLUME OF WATER RECYCLED AND REUSED

Management Approach

The water used by the Mitsubishi Electric Group is mainly tap water, industrial-use water and groundwater. As well as understanding the usage status at all sites, we practice the 3Rs (reduce, reuse, recycle) for water and are promoting greater awareness of water stress (i.e., strained water supply/demand conditions) at production sites in Japan and overseas. Regarding the water footprint of products, including the stages of procurement, production and product usage, the possibility of excessive use of water in regions in Japan and overseas has not been verified by the Mitsubishi Electric Group.

Biodiversity	G4-EN11	OPERATIONAL SITES OWNED, LEASED, MANAGED IN, OR ADJACENT TO, PROTECTED AREAS AND AREAS OF HIGH BIODIVERSITY VALUE OUTSIDE PROTECTED AREAS
	G4-EN12	DESCRIPTION OF SIGNIFICANT IMPACT OF ACTIVITIES, PRODUCTS, AND SERVICES ON BIODIVERSITY IN PROTECTED AREAS AND AREAS OF HIGH BIODIVERSITY VALUE OUTSIDE PROTECTED AREAS
	G4-EN13	HABITATS PROTECTED OR RESTORED
	G4-EN14	TOTAL NUMBER OF IUCN RED LIST SPECIES AND NATIONAL CONSERVATION LIST SPECIES WITH HABITATS IN AREAS AFFECTED BY OPERATIONS, BY LEVEL OF EXTINCTION RISK

The Mitsubishi Electric Group does not mine, harvest, cultivate or produce raw materials, and therefore

does not directly destroy forests or ecosystems. Our production sites have not been verified to have any significant influence in terms of either scale or frequency. This is because our long-standing factory operations in Japan have been coexisting harmoniously with the natural environment for several decades, and because none of our factories in urban areas are in close proximity to areas of high biodiversity value. Production sites overseas are located in industrial complexes, and there are no plans to newly develop production sites requiring large areas.

We have taken action by preparing the Biodiversity Action Guidelines. To ensure that biodiversity is considered in all of our business activities, these guidelines include the pledge of every Mitsubishi Electric Group employee to understand the relationship between business activities and biodiversity.

Emissions	G4-EN15	DIRECT GREENHOUSE GAS (GHG) EMISSIONS (SCOPE 1)
	G4-EN16	ENERGY INDIRECT GREENHOUSE GAS (GHG) EMISSIONS (SCOPE 2)
	G4-EN17	OTHER INDIRECT GREENHOUSE GAS (GHG) EMISSIONS (SCOPE 3)
	G4-EN18	GREENHOUSE GAS (GHG) EMISSIONS INTENSITY
	G4-EN19	REDUCTION OF GREENHOUSE GAS (GHG) EMISSIONS
	G4-EN20	EMISSIONS OF OZONE-DEPLETING SUBSTANCES (ODS)
	G4-EN21	NO _x , SO _x AND OTHER SIGNIFICANT AIR EMISSIONS

Operations of the Mitsubishi Electric Group emit four types of greenhouse gases through business activities: CO₂, sulfur hexafluoride (SF₆), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs). Reducing the emission of these gases is managed through the use of numerical targets. For CO₂ in particular, we are working to reduce emissions through energy-saving activities for production lines and utilities, and increasing the use of renewable energy systems in the form of photovoltaic power generation. Here, "CO₂ emissions per unit of sales" is used as an important indicator. The Mitsubishi Electric Group invests 0.15% of its sales every fiscal year to reduce CO₂ emissions generated during production.

For greenhouse gases emitted upstream and downstream outside of business activities, we are working to reduce emissions generated at the time of product usage and during transportation (sales distribution). The CO₂ emitted when products are being used is dozens to hundreds of times greater than that emitted during production processes. Therefore, developing and disseminating products high in energy efficiency generates a mitigating effect. This is also part of the Mitsubishi Electric Group's growth strategy, where we are using the "average reduction ratio of CO₂ from product usage" as an important indicator. In the area of sales distribution, we are reducing the number of trucks used by improving loading capacity and moving ahead with modal shift initiatives.

Substances that cause atmospheric pollution, including nitrogen oxide (NO_x), sulfur oxide (SO_x), volatile organic compounds (VOCs) and dust/soot, are being managed on the basis of legal compliance.

Effluents and Waste	G4-EN22	TOTAL WATER DISCHARGE BY QUALITY AND DESTINATION
	G4-EN23	TOTAL WEIGHT OF WASTE BY TYPE AND DISPOSAL METHOD
	G4-EN24	TOTAL NUMBER AND VOLUME OF SIGNIFICANT SPILLS
	G4-EN25	WEIGHT OF TRANSPORTED, IMPORTED, EXPORTED OR TREATED WASTE DEEMED HAZARDOUS UNDER THE TERMS OF THE BASEL CONVENTION 2ND MEETING ANNEX I, II, III, AND VII, AND PERCENTAGE OF TRANSPORTED WASTE SHIPPED INTERNATIONALLY
		IDENTITY, SIZE, PROTECTED STATUS AND

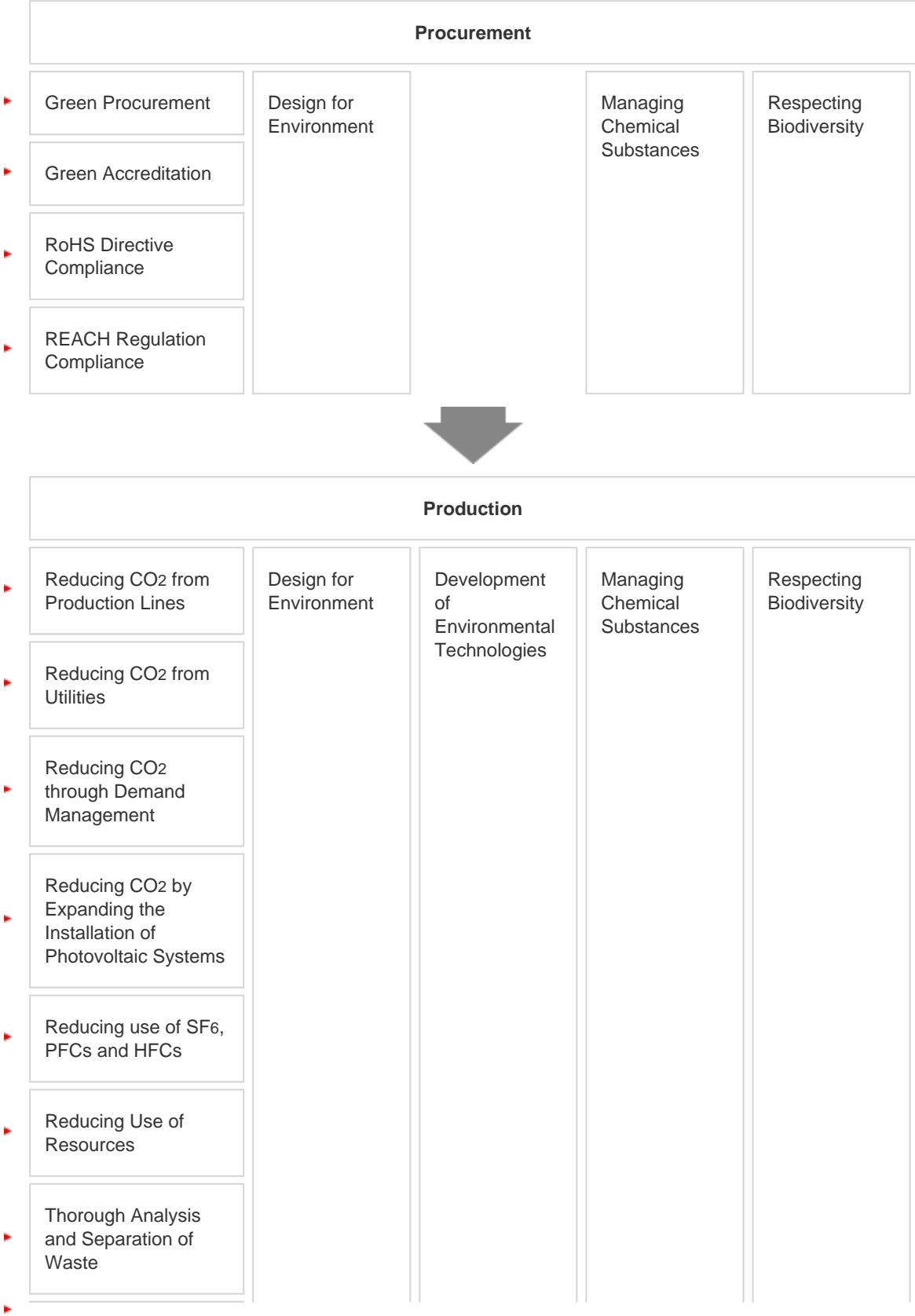
	G4-EN26	BIODIVERSITY VALUE OF WATER BODIES AND RELATED HABITATS SIGNIFICANTLY AFFECTED BY THE ORGANIZATION'S DISCHARGE OF WATER AND RUNOFF
<p>The Mitsubishi Electric Group conducts thorough management in accordance with local laws and regulations in Japan and overseas to ensure that the water it discharges doesn't cause pollution or damage to the ecosystem and people's lives and cultures due to chemical substances, chemical/nutritional load or suspended solids. If an individual improvement issue arises at a business site, the site is subjected to continual improvement measures within an individual environmental management program. The total volume of water discharged is being minimized by increasing the water recycling ratio.</p> <p>In order to minimize the final disposal volume of waste, the Mitsubishi Electric Group conducts thorough waste analysis and separation (conversion to valuable resources), exploits waste disposal contractors, works to improve waste transportation efficiency, and has set "final disposal ratio" as an important indicator. Furthermore, in order to prevent waste-based pollution and end-of-life home appliance disposal issues, we ensure strict legal compliance and are taking steps to introduce an electronic manifest system.</p>		
Products and Services	G4-EN27	EXTENT OF IMPACT MITIGATION OF ENVIRONMENTAL IMPACTS OF PRODUCTS AND SERVICES
	G4-EN28	PERCENTAGE OF PRODUCTS SOLD AND THEIR PACKAGING MATERIALS THAT ARE RECLAIMED BY CATEGORY
<p>To reduce the environmental impact of its product and services, the Mitsubishi Electric Group promotes Design for Environment activities based on product assessments derived from three perspectives: "effective use of resources," "efficient use of energy" and "avoidance of substances that are particularly harmful to the environment."</p> <p>Effective use of resources is an initiative linked to reducing the amount of resources introduced (see "Materials" aspect). Efficient use of energy is an initiative linked to reducing CO2 emissions resulting from product usage (see "Energy" and "Emissions" aspects).</p> <p>Avoidance of substances that are particularly harmful to the environment is an initiative linked to preventing atmospheric, water and soil pollution and preserving biodiversity (see "Biodiversity," "Emissions" and "Effluents and Waste" aspects).</p> <p>Regarding products, in order to design easily recyclable products, we hold Design for Environment technical seminars, which provide an opportunity for feedback on product design. We also develop technologies for recovering and sorting materials, as well as technologies for utilizing recycled materials. End-of-life products recovered under Japan's Home Appliance Recycling Law are processed appropriately and recycled at a Group company.</p> <p>Regarding packaging, to reduce transportation packaging, we're promoting the use of simpler packaging, expanding the application of returnable containers and packaging, and recycling used packaging.</p>		
Compliance	G4-EN29	MONETARY VALUE OF SIGNIFICANT FINES AND TOTAL NUMBER OF NON-MONETARY SANCTIONS FOR NON-COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS
<p>To ensure there are no environmental accidents or violations of environmental laws and regulations, we aim to ensure that employees understand and are aware of related laws and regulations. This includes sharing information about recent trends as well as about causes and countermeasures for even the smallest of mistakes. We also conduct regular equipment inspections. At all sites where PCB waste is stored or devices containing PCB are used, inspection/verification of storage/usage conditions is carried out at least once a year together with planning for disposal.</p>		
Transport	G4-EN30	SIGNIFICANT ENVIRONMENTAL IMPACT OF TRANSPORTING PRODUCTS AND OTHER GOODS AND MATERIALS FOR THE ORGANIZATION'S OPERATIONS, AND TRANSPORTING MEMBERS OF THE WORKFORCE
<p>The Mitsubishi Electric Group procures raw materials globally, but has not formed a large-scale supply/distribution network for products. Therefore, significant environmental impact as the result of transportation (distribution) has not been verified.</p>		

- For energy consumption and CO2 emissions from transportation (distribution) and reducing the use of packaging materials, please see "Energy," "Emissions" and "Products and Services."

Overall	G4-EN31	TOTAL ENVIRONMENTAL PROTECTION EXPENDITURES AND INVESTMENTS BY TYPE
Regarding total environmental protection expenditures, based on the "Environmental Accounting Guidelines 2005" produced by the Japanese Ministry of the Environment, a summary of environmental capital investment, environmental costs and environmental R&D costs is calculated and announced each year.		
Supplier Environmental Assessment	G4-EN32	PERCENTAGE OF NEW SUPPLIERS THAT WERE SCREENED USING ENVIRONMENTAL CRITERIA
	G4-EN33	SIGNIFICANT ACTUAL AND POTENTIAL NEGATIVE ENVIRONMENTAL IMPACT IN THE SUPPLY CHAIN AND ACTIONS TAKEN
To prevent and mitigate negative environmental impact in supply chains, based on the Green Procurement Standards Guide, the Green Accreditation system was implemented in April 2006 to evaluate our suppliers. A green accreditation rate of 100% is being maintained.		
Environmental Grievance Mechanisms	G4-EN34	NUMBER OF GRIEVANCES ABOUT ENVIRONMENTAL IMPACT FILED, ADDRESSED, AND RESOLVED THROUGH FORMAL GRIEVANCE MECHANISMS
Environmental grievances are processed through the Corporate Environmental Sustainability Group.		

Environment – Environmental Considerations for Value Chain Management

The Mitsubishi Electric Group promotes various countermeasures that are contributing to the realization of a sustainable society. Examples include initiatives such as reducing greenhouse gas emissions, efficiently using resources, preventing environmental pollution and respecting biodiversity in each process of the value chain, from procurement, manufacturing and delivery to use and disposal/recycling. For a more detailed explanation, click on one of the initiatives listed below.



▶ Sourcing of Disposal Contractors				
▶ Building Waste and Recycling Logistics Systems That Eliminate Wastefulness				
▶ Promoting Water Conservation and Water Recycling				



Delivery

▶ Reducing the Number of Trucks by Improving Load Ratios	Design for Environment	Development of Environmental Technologies	Respecting Biodiversity
▶ Switching to Rail and Marine Transport (modal shift)			
▶ Reducing the Use of Disposable Packaging Materials			



Use

▶ Reducing CO2 from Product Usage through Improved Product Performance	Design for Environment	Development of Environmental Technologies	Respecting Biodiversity
▶ Expanding Our Contributions to Reducing CO2 from Product Usage			



Disposal/Recycling

▶ Recycling End-of-Life Products	Design for Environment	Development of Environmental Technologies	Respecting Biodiversity
▶ Promoting the			

<p>▶ Recycling of Large-scale/High-purity Plastics</p>			
<p>▶ Promoting the Recovery and Recycling of Rare Earth Metals Used by Magnet Manufacturers</p>			

The following page lists the materials balance for the value chain:

▶ Environment: Material Balance

The following page lists the greenhouse gas emissions for the value chain:

▶ Environment: Value Chain Greenhouse Gas Emissions

Environment – Data & Charts in Fiscal 2014

■ Period and Scope of the Report

Overview of reporting period and scope.

Chinese language version of the above page:

- ▶ 关于报告期间与范围
-

■ Material Balance

Overview of reporting period and scope.

Chinese language version of the above page:

- ▶ 物料衡算
-

■ Environmental Accounting

Report on fiscal 2014 totals, calculated under the Environmental Accounting Guidelines (fiscal 2006 edition) issued by Japan's Ministry of the Environment.

■ Environmental Performance Data

Data on the results of fiscal 2014 activities, examples of domestic and overseas activities related to respecting biodiversity, and participation in exhibitions and events.

■ Awards

Awards received in Japan and overseas.

Environment – Period and Scope of the Report

Basic Policy and Approach to Environmental Management / Period and Scope of Environmental Report 2014

This report defines important points and crystallizes measures based on a backcasting approach toward achieving the targets of the 7th Environmental Plan (fiscal 2013 to fiscal 2015) and Environmental Vision 2021. Using the PDCA (plan-do-check-act) cycle, the report discusses the targets, activities and results achieved in fiscal 2014. While some activities reported are not included in the 7th Environmental Plan, we have included these because we believe they are essential to achieving a sustainable society. The report ensures that the PDCA cycle for these activities is also understood. The period and scope of the report are noted below.

Period Covered by the Report

April 1, 2013 – March 31, 2014

* Also includes some information on policies, targets and plans occurring after the close of fiscal 2015.

Scope of the Report

Covers the activities of Mitsubishi Electric Corporation, 116 affiliates in Japan, and 73 overseas affiliates (total of 190 companies).

* Until fiscal 2009, the scope of the report focused on Group companies that had drawn up an environmental plan to ensure a scope of systematic governance from an environmental conservation standpoint. Based on the expanding nature of global environmental management, however, the scope was extended to Mitsubishi Electric Corporation and its major affiliated companies.

Contact Us About the Report

We endeavor to fulfill our responsibility of presenting information to the public in order to broaden our range of communication with stakeholders. We appreciate any and all frank and honest feedback intended to further improve the report.

Inquiries: [Click here to send an inquiry](#)

Environment – Material Balance

Overall Environmental Impact

Period: April 1, 2013 - March 31, 2014

Scope of Data Compilation : Mitsubishi Electric Corporation, 116 affiliates in Japan and 73 overseas affiliates (total of 190 companies)

* Up to fiscal 2009, the scope of our report was limited to those companies that had drawn up an environmental plan for governance from an environmental conservation perspective. But under the policy of expanding global environmental management, we have broadened the scope of the report to cover Mitsubishi Electric, and consolidated subsidiaries, and its affiliated companies.



IN

Materials for Manufacturing			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Materials *1	320,000 tons	80,000 tons	230,000 tons
Manufacturing			
Electricity	103 million kWh	340 million kWh	330 million kWh
Natural gas	22,190,000 m ³	2,580,000 m ³	11,020,000 m ³
LPG	1,815 tons	2,339 tons	575 tons
Oil (crude oil equivalent)	5,891 kl	3,193 kl	1,822 kl
Water	7,240,000 m ³	1,670,000 m ³	2,170,000 m ³
Public water	1,260,000 m ³	450,000 m ³	510,000 m ³
Industrial water	2,090,000 m ³	230,000 m ³	1,480,000 m ³
Groundwater	3,890,000 m ³	990,000 m ³	20,000 m ³
Others	0 m ³	0 m ³	160,000 m ³
Reuse of water	3,480,000 m ³	1,510,000 m ³	130,000 m ³
Controlled chemical substances (amounts handled)	7,113 tons	1,950 tons	4,610 tons
Ozone depleting substances (amounts handled)	1.5 tons	169 tons	1,054 tons
Greenhouse gases (amounts handled)	3,403 tons	46 tons	3,012 tons
Volatile organic compounds (amounts handled)	1,352 tons	1,359 tons	208 tons

*1 Materials: Total value for shipping weight of "Design for the Environment" (DfE) products, plus amount of product packaging materials used, plus total amount of waste.



OUT

Emissions (From Manufacturing)				
		Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Discharge into water	Water	6,510,000 m ³	1,260,000 m ³	1,610,000 m ³
	Controlled chemical substances	5.6 tons	0.0 tons	39.2 tons
	BOD (biological oxygen demand)	61.6 tons	5.2 tons	28.5 tons
	COD (chemical oxygen demand)	12.5 tons	5.6 tons	47.7 tons
	Nitrogen	71.3 tons	13.4 tons	5.7 tons
	Phosphorus	2.9 tons	0.2 tons	0.1 tons
	Suspended solids	50.6 tons	3.0 tons	0.4 tons
	n-hexane extracts (mineral)	1.2 tons	0.3 tons	0.0 tons
	n-hexane extracts (active)	3.2 tons	0.2 tons	0.0 tons
	Total emissions of zinc	0.4 tons	0.0 tons	0.4 tons
Emissions into the atmosphere	Carbon dioxide(CO ₂)	506,000 tons-CO ₂	168,000 tons-CO ₂	266,000 tons-CO ₂
	Controlled chemical substances (excluding amounts contained in other waste)	412.6 tons	209.6 tons	235.6 tons
	Ozone depleting substances	0.0 ODP tons	0.0 ODP tons	0.7 ODP tons
	Greenhouse gases	77,000 tons-CO ₂	48,000 tons-CO ₂	124,000 tons-CO ₂
	Volatile organic compounds	502.0 tons	300.6 tons	7.1 tons
	Sulfur oxide (SO _x)	1.1 tons	0.5 tons	11.7 tons
	Nitrogen oxide (NO _x)	14.6 tons	11.0 tons	19.6 tons
	Fly ash	0.6 tons	0.4 tons	27.3 tons
Amount of CFCs recovered		2.7 tons	240.6 tons	—
Waste				
Total waste emissions		91,778 tons	64,065 tons	62,040 tons
Amount recycled		80,197 tons	61,797 tons	56,848 tons
Waste treatment subcontracted out		22,587 tons	54,277 tons	57,491 tons
Final disposal		1 tons	55 tons	643 tons
In-house weight reduction		1,651 tons	0 tons	747 tons
Products				
Weight of all "DfE" Products sold *2		180,000 tons	10,000 tons	50,000 tons
Weight of packaging materials		52,000 tons	7,000 tons	119,000 tons

*2 Products sold: Shipping weight of "Design for the Environment" (DfE) products.



IN

Sales and Logistics *3			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Fuel for trucks (gasoline)	12,190 kl	1,784 kl	187 kl
Fuel for trucks (diesel)	26,772 kl	5,363 kl	14,689 kl
Fuel for rail (electricity)	2,011 Mwh	402 Mwh	0 Mwh
Fuel for marine transport (bunker oil)	344 kl	0 kl	67,567 kl
Fuel for air transport (jet fuel)	557 kl	117 kl	22,424 kl

*3 Sales and logistics: Includes one sales company in Japan. Figures for overseas affiliated companies include transportation between countries.



OUT

Emissions *4			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Carbon dioxide (CO2)	101,000 tons-CO2	180,000 tons-CO2	292,000 tons-CO2

*4 Emissions: Includes one sales company in Japan. Figures for overseas affiliated companies include transportation between countries.

IN

Energy Consumption *5			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Energy consumed during product use	81,200 million kWh	6,300 million kWh	11,700 million kWh

*5 Energy consumption: Total energy consumed (estimated value) when using 97 finished products targeted for CO₂ reduction. The length of use (operating time) is set for each product according to statutory useful life, designed service life, statistical values, etc.



OUT

Emissions			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Amount of CO ₂ emitted during product use (converted value) *6	41,430,000 tons-CO ₂	3,110,000 tons-CO ₂	9,640,000 tons-CO ₂
Amount of SF ₆ emitted during product use (corresponding value) *7	61,000 tons-CO ₂	—	—

*6 Amount of CO₂ emitted during product use (converted value): Sum of CO₂ emitted when using 97 finished products targeted for CO₂ reduction. The amount of CO₂ emitted is equal to the energy consumed multiplied by the CO₂ emissions coefficient, for which the value shown in CO₂ Emissions from Fuel Combustion Highlights (2013 Edition) is used.

*7 Amount of SF₆ emitted during product use (corresponding value): Sum of SF₆ gas naturally leaked during the operation of products (6) that use SF₆ gas for insulation. Leakage rate used is the value from JEAC5001-2000. Global warming potential value used is from the 2nd Revised Guidelines of the IPCC.



IN

End-of-Life Products *8	
	Mitsubishi Electric
Air conditioners	15,939 tons
Televisions	4,246 tons
Refrigerators	24,487 tons
Washing machines / Clothes dryers	8,009 tons
Personal computers	133 tons

*8 End-of-Life Products: Weight of products recovered from four types of appliances subject to Japan's Home Appliance Recycling Law, plus personal computers.



OUT

Resources Recovered *9	
	Mitsubishi Electric
Metals	31,289 tons
Glass	1,599 tons
CFCs	328 tons
Others	13,439 tons

*9 Resources recovered: Weight of resources recovered from four types of appliances subject to Japan's Home Appliance Recycling Law, plus personal computers.

Environment – Environmental Accounting

Scope and Period of Data Compilation and Basis of Calculation

Scope and Period of Data Compilation

- Period: April 1, 2013 - March 31, 2014
- Scope of Data Compilation: Mitsubishi Electric Corporation, 116 affiliates in Japan and 73 overseas affiliates (total of 190 companies)

* The scope of data compilation is the same as the scope covered in this Environmental Report.

Basis of Calculation

- Data is calculated for environmental conservation costs, environmental conservation benefits (environmental performance) and economic benefits from environmental conservation activities (actual profit or cost-saving benefits) in accordance with the Environmental Accounting Guidelines (fiscal 2006 edition) issued by Japan's Ministry of the Environment.
- Economic benefits are ascertained in terms of real benefits, which consist of earnings and savings, and estimated benefits. Estimated benefits include the economic benefits to customers of using our products, such as lower electricity bills, and environmental improvements produced outside our business sites.

* Environmental conservation costs reflect straight-line depreciation for capital investments made over the past five years and assumed to have useful lives of five years. The annual benefits of earnings and savings attributable to capital investments, too, are assumed to have resulted from investments over the past five years.

* For comparisons to the previous year, the previous year's data has also been revised to reflect changes in the scope/range of data.

Summary of Fiscal 2014

Environmental Conservation Costs

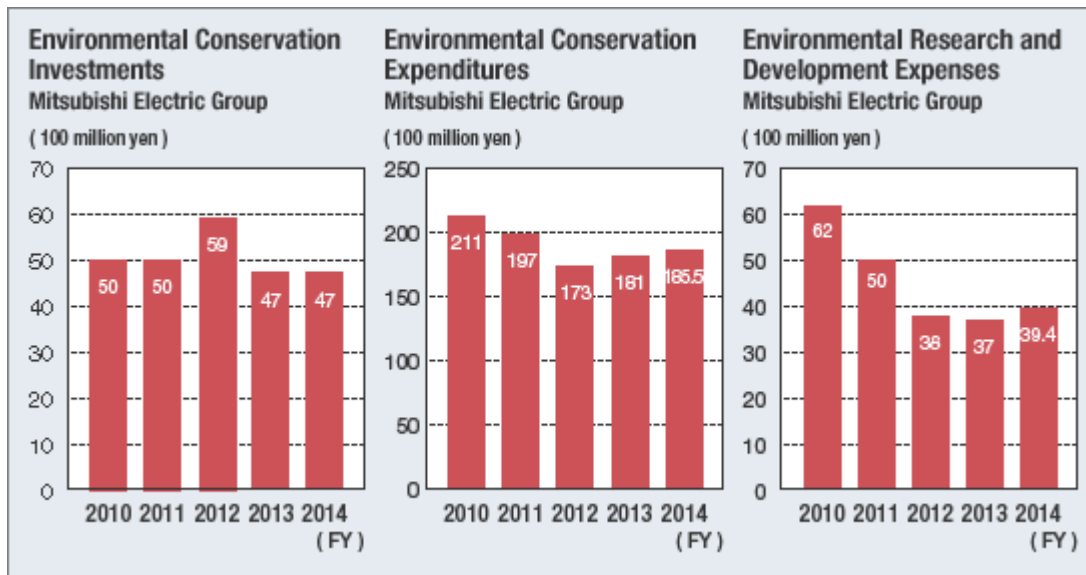
Compared to the previous year, fiscal 2014 environmental capital investment was almost the same, while environmental costs increased.

- **Environmental Capital Investment**

Capital investment was 4.7 billion yen for the Mitsubishi Electric Group as a whole (year-on-year increase of 0.02 billion yen), and 3.59 billion for Mitsubishi Electric (year-on-year increase of 0.29 billion yen). Investments were made in energy-saving measures that included upgrading air conditioners, lowering production line power consumption, introducing LED lighting fixtures, upgrading to high-efficiency transformers and integrating power distribution facilities.

- **Environmental Costs**

Environmental costs were 18.55 billion yen for the Mitsubishi Electric Group as a whole (year-on-year increase of 0.49 billion), and 13.5 billion for Mitsubishi Electric (year-on-year decrease of 0.27 billion yen). In fiscal 2014, costs increased owing to continuing water contamination prevention measures on business premises, outsourcing of valuable-resource recycling, appropriate processing of PCB waste and a focus on R&D related to energy measures. Upstream and downstream costs decreased in fiscal 2014 owing to the influence of higher than average green procurement costs in the previous year.



Environmental Conservation Benefits (Environmental Performance)

Total energy inputs in fiscal 2014 decreased compared to the previous year as a result of significant investments made in the previous year.

Economic Benefits from Environmental Conservation Activities (Actual Benefits)

In fiscal 2014, actual benefits resulting from energy-saving measures and valuable-resource recycling decreased for the Group as a whole.

Economic Benefits from Environmental Consideration in Products and Services (Estimated Benefits)

Progress towards higher efficiency and increased energy savings of products including PV systems, heat-pump water heater systems, room air conditioners and Lossnay total heat exchange ventilator fans enabled reduced electricity costs for our customers.

Environmental Conservation Costs

Top figure: Mitsubishi Electric Group / Bottom figure: Mitsubishi Electric / Unit: 100 million yen

Item	Capital Investment	Costs*	Year-on-Year Change	Main Costs
Business area activities	42.0	109.9	9.6	-
	30.9	69.0	1.1	
Pollution prevention	3.3	26.2	3.1	Maintenance of wastewater treatment facilities/exhaust treatment facilities
	2.2	18.4	2.9	
Global environmental conservation	38.5	50.4	3.0	Upgrading air conditioners, introducing servomotors for sheet-metal turret punch presses, introducing LED lighting, upgrading transformers, integrating power distribution facilities, installing photovoltaic systems
	28.7	32.1	(1.0)	
Resource recycling	0.1	33.3	3.5	Recycling valuable resources, consigning PCB-related processing, consigning wood-chip recycling processes
	0.0	18.4	(0.7)	
Upstream and downstream from production	0.8	4.7	(5.1)	Recycling center construction, transport/product packaging improvements, green procurement
	0.8	2.9	(4.9)	
Management activities	0.0	29.8	(0.5)	ISO 14001 review (certification acquisition, maintenance, upgrades), participation in

	0.0	22.7	(1.3)	environment-related exhibitions, publication of report disclosing environmental information, collection of environmental data, operation of chemical substance management system, site beautification and greenification
R&D activities	4.2	39.4	2.6	Activities related to smart grids, air conditioner energy savings, SiC devices, plastics, rare-metal recycling, vacuum circuit breakers with less environmental impact, development of high-efficiency motors
	4.2	38.9	4.0	
Community activities	0.0	0.3	0.0	Satoyama woodland preservation activities, river/local region clean-up, Mitsubishi Electric Outdoor Classroom
	0.0	0.2	0.0	
Environmental damage	0.0	1.3	(1.7)	Measures for oil-contaminated soil on old factory sites, groundwater measurement/treatment facilities
	0.0	1.3	(1.7)	
Consolidated total	47.0	185.5	4.9	
Non-consolidated total	35.9	135.0	(2.7)	—

* Includes depreciation of capital investment over the past five years.

Environmental Conservation Benefits (Environmental Performance)

Top figure: Mitsubishi Electric Group / Bottom figure: Mitsubishi Electric / Unit: 100 million yen

Item	Unit	Fiscal 2014	Year-on-Year Change	Year-on-Year Per Net Sales
Total energy used	10,000 GJ	1,906	(10)	89%
		1,144	(44)	91%
Total water used	10,000 m ³	1,107	43	93%
		724	(5)	94%
Total greenhouse gas emissions	10,000 tons-CO ₂	119	1	91%
		58	(4)	88%
CO ₂ (energy consumption)	10,000 tons-CO ₂	94	1	90%
		51	0	95%
HFC,PFC,SF ₆	10,000 tons-CO ₂	25	1	92%
		8	(4)	61%
Total releases and transfers of chemical substances into the atmosphere	Tons	810	(76)	82%
		502	(39)	88%
Total wastewater discharged	10,000 m ³	938	15	91%
		651	(13)	93%
Total releases and transfers of chemical substances into the water and soil	Tons	45	(5)	81%
		6	(2)	70%
Total waste discharged	Tons	217,883	23,627	101%
		91,778	9,587	106%
Final disposal	Tons	699	(246)	66%
		1	(1)	45%

Economic Benefits from Environmental Conservation Activities (Actual Benefits)

Top figure: Mitsubishi Electric Group / Bottom figure: Mitsubishi Electric / Unit: 100 million yen

Item	Amount	Year-on-Year Change	Main Benefits
Earnings	30.4	(12.4)	Cost of selling the saleable materials resulting from recycling of scrap metal, etc.
	14.8	0.1	
Savings	30.1	(9.9)	Reduction in electricity costs from energy-saving air conditioning/lighting facilities, upgraded transformers and power distribution facilities, valuable-resource recycling, reduced use of packaging materials, etc.
	15.2	(9.1)	
Total	60.5	(22.3)	-
	30.0	(9.1)	

Economic Benefits from Environmental Consideration in Products and Services (Estimated Benefits)

Top figure: Mitsubishi Electric Group (consolidated basis) / Bottom figure: Mitsubishi Electric / Unit: 100 million yen

Item	Amount	Main Products
Economic benefits to customers*1	12,692	Reduction in electricity costs owing to reduced energy consumption*2 of 97 final products (including plant monitoring and control devices, air conditioning and vehicle-mounted equipment for automobiles, monitoring, protection and control devices for power-generation plants, particle therapy systems, circuit breakers, elevators, satellite communications earth station systems, optical and wireless access systems, air conditioners, televisions, refrigerators, Lossnay systems, processing machines, robots, lighting fixtures and lamps, IH cooking heaters, etc.)
	10,826	

*1 The economic benefit to customers was recalculated on September 1, 2014.

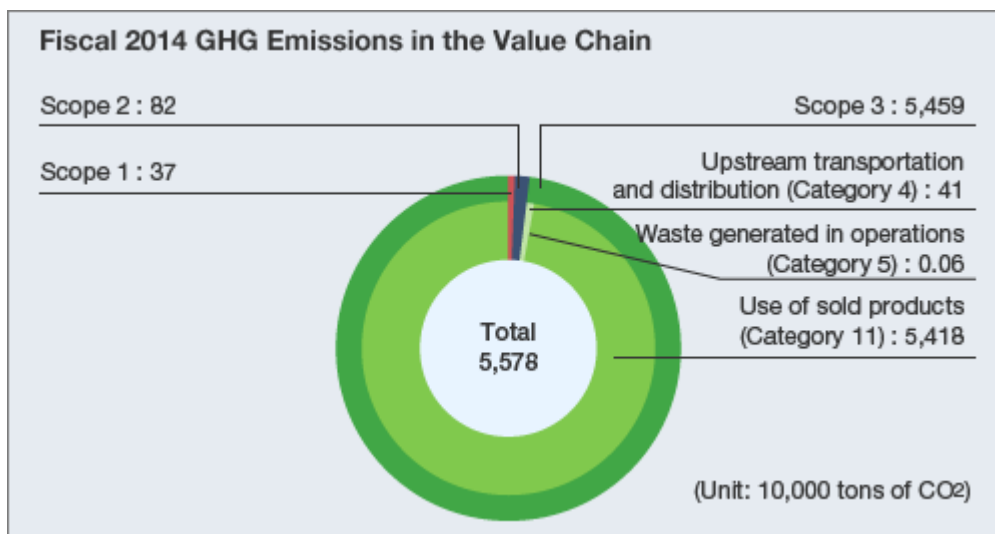
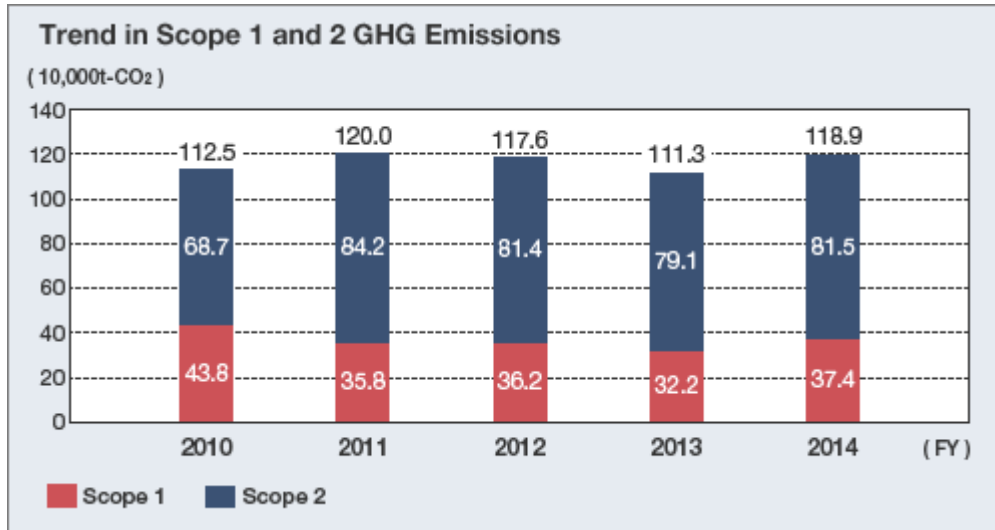
*2 The baseline products used to calculate the reduction in energy consumption correspond to products sold in fiscal year 2001. In calculating the amount of economic benefit, reference was made to electricity prices in "IEA Energy Prices and Taxes."

Environment – Environmental Performance Data

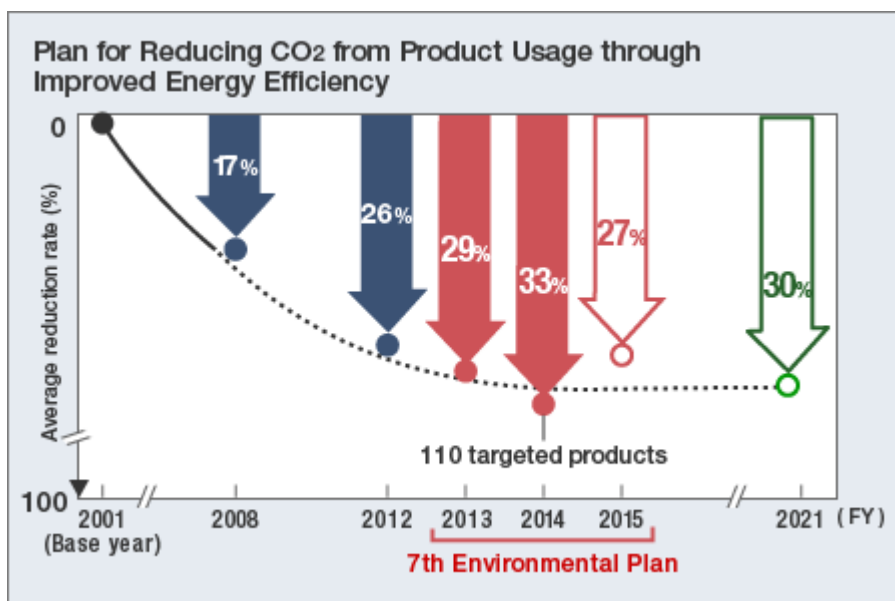
Results of Activities in Fiscal 2014

- ▶ Trend in Scope 1 and 2 GHG Emissions
- ▶ Fiscal 2014 GHG Emissions in the Value Chain
- ▶ Plan for Reducing CO₂ from Product Usage through Improved Energy Efficiency
- ▶ Plan to Reduce CO₂ from Production across the Mitsubishi Electric Group
- ▶ Photovoltaic Power Generation Capacity
- ▶ Reduction in Greenhouse Gas Emissions (SF₆, PFCs, HFCs)
- ▶ Emissions of Non-CO₂ Greenhouse Gases
- ▶ Total CO₂ Emissions in Distribution
- ▶ Fiscal 2014 Share of Transport by Mode
- ▶ Plan for Reducing Use of Resources
- ▶ Japan-wide Recycling of Four Kinds of Mitsubishi Electric Home Appliances
- ▶ Final Waste Disposal Ratio Reduction Plan
- ▶ Total Waste Output [Mitsubishi Electric]
- ▶ Total Waste Output [Affiliates in Japan]
- ▶ Total Waste Output [Overseas affiliates]
- ▶ Packaging Material Usage and Per Net Shipping Weight
- ▶ Breakdown of Water Usage
- ▶ Total Water Usage
- ▶ Water Recycling Ratio
- ▶ Material Balance of Chemical Substances Subject to Regulation
- ▶ Environmental Accounting
- ▶ Numbers of Classroom Leaders Trained through FY2014
- ▶ Numbers of Mitsubishi Electric Outdoor Classroom through FY2014

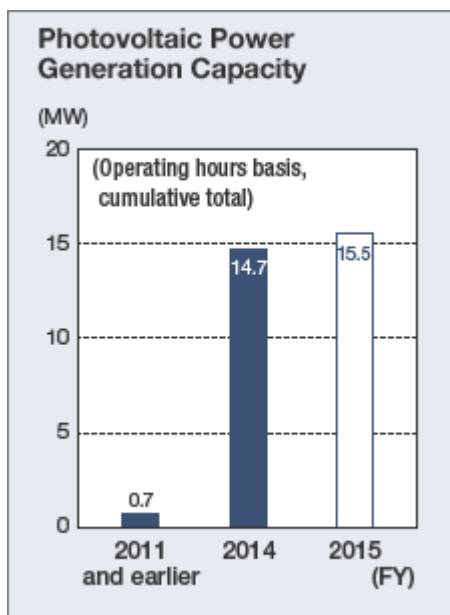
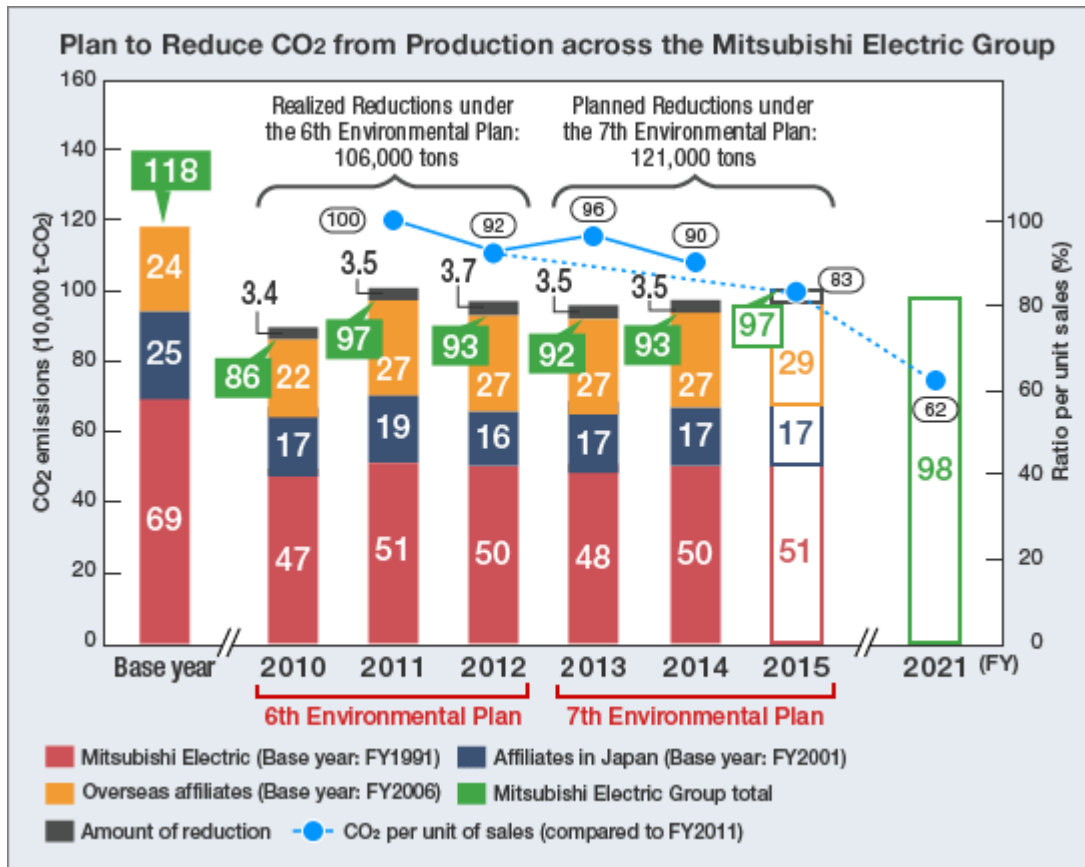
Reducing Greenhouse Gases Emitted in the Value Chain



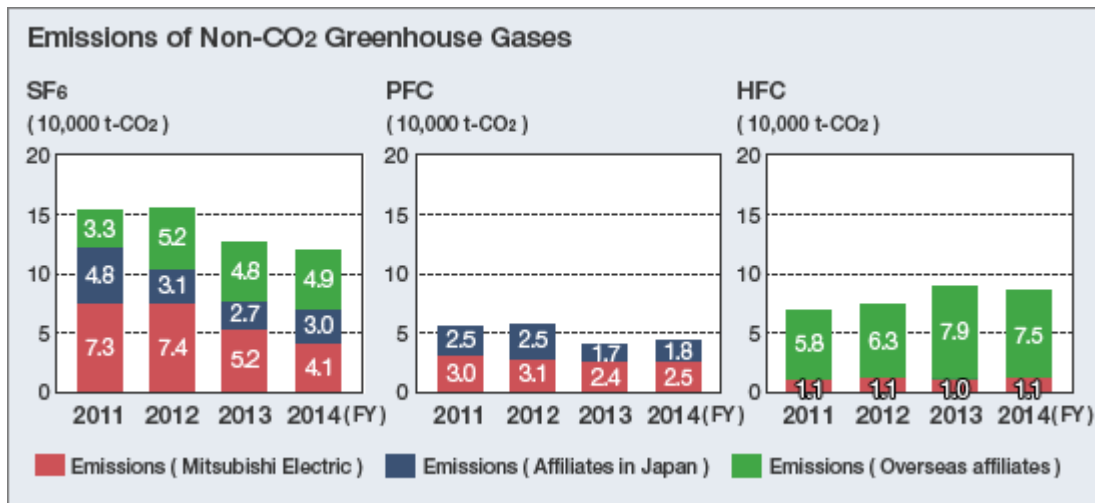
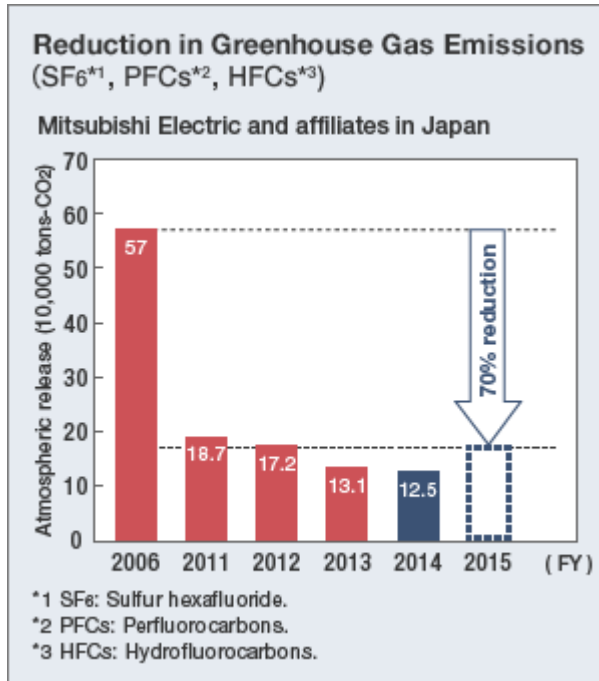
Reducing CO₂ from Product Usage



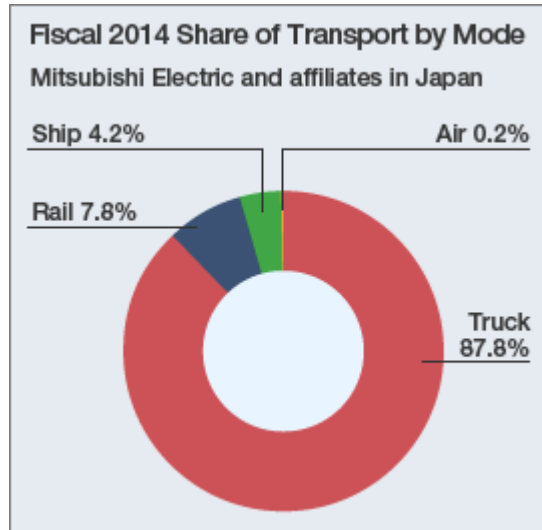
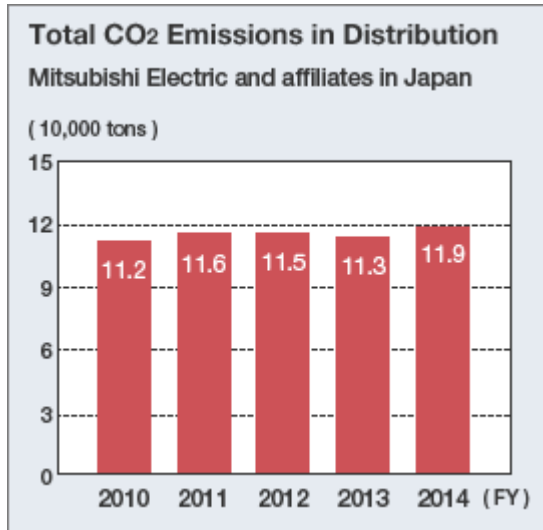
Reducing CO2 from Production



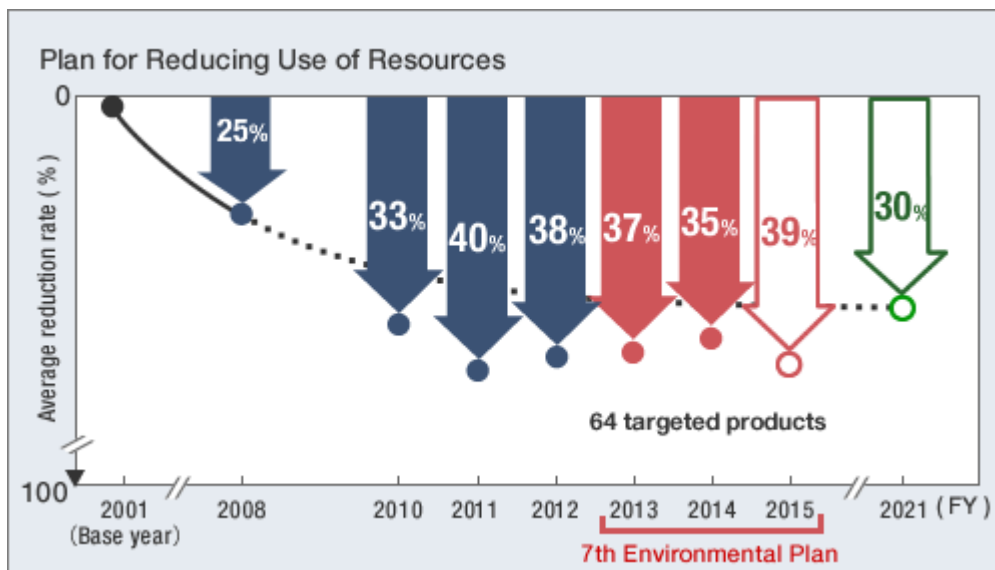
Reducing Emissions of Non-CO2 Greenhouse Gases



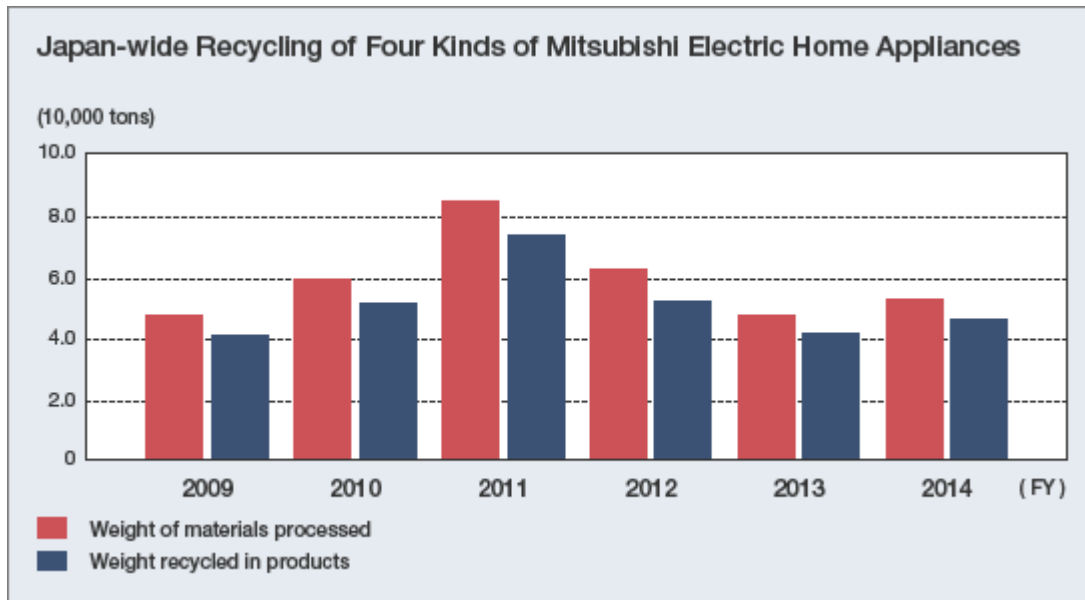
Reducing Emissions of Non-CO2 Greenhouse Gases



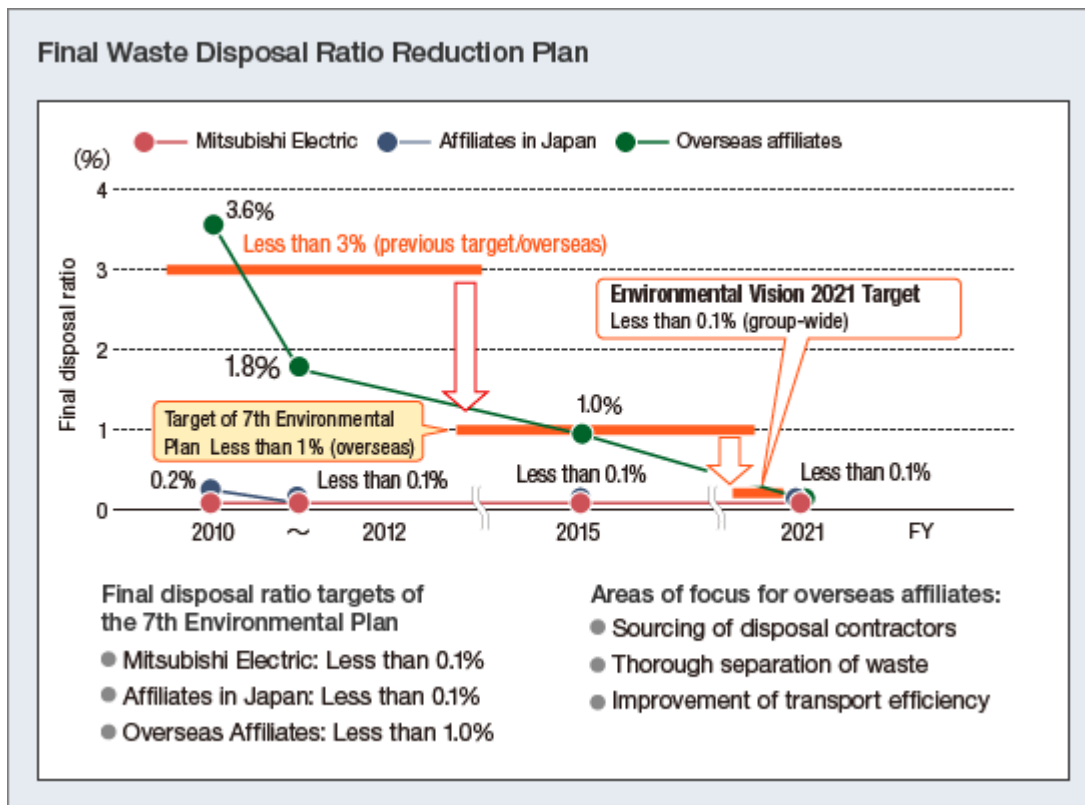
Reducing Use of Resources

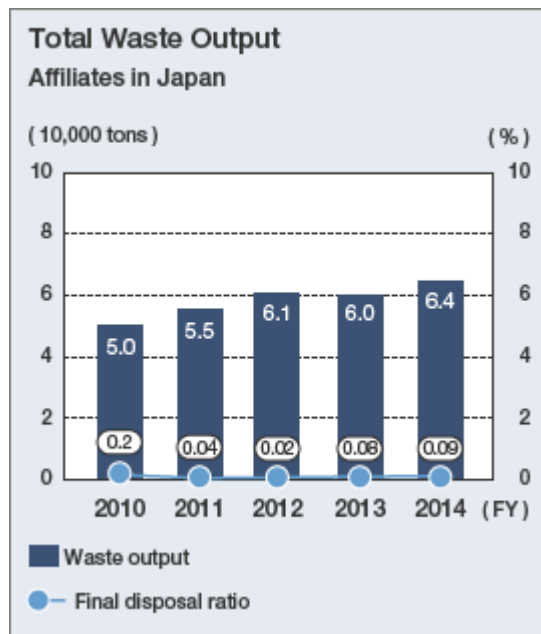
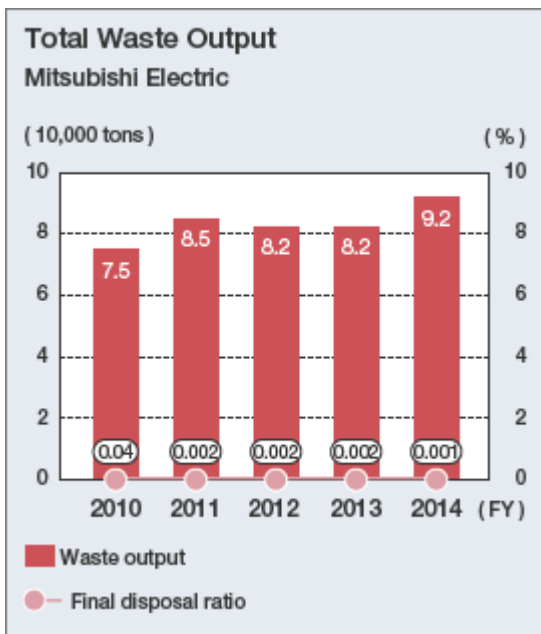


Recycling End-of-Life Products

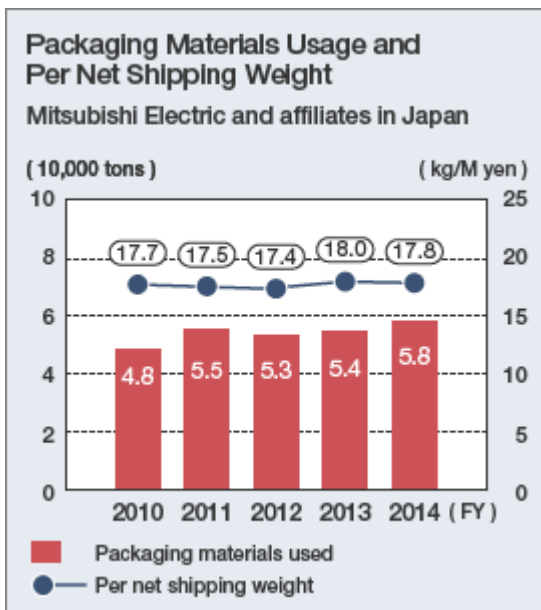


Initiatives toward Zero Final Waste Disposal Ratio

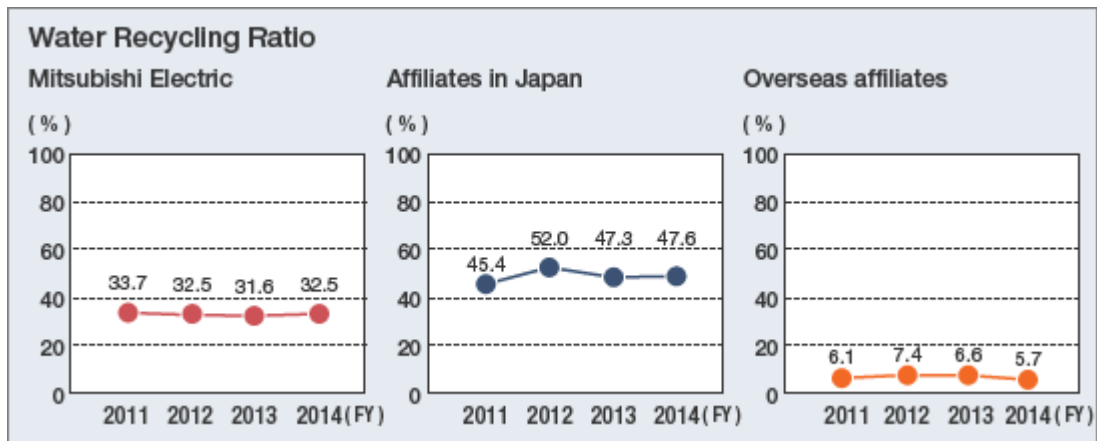
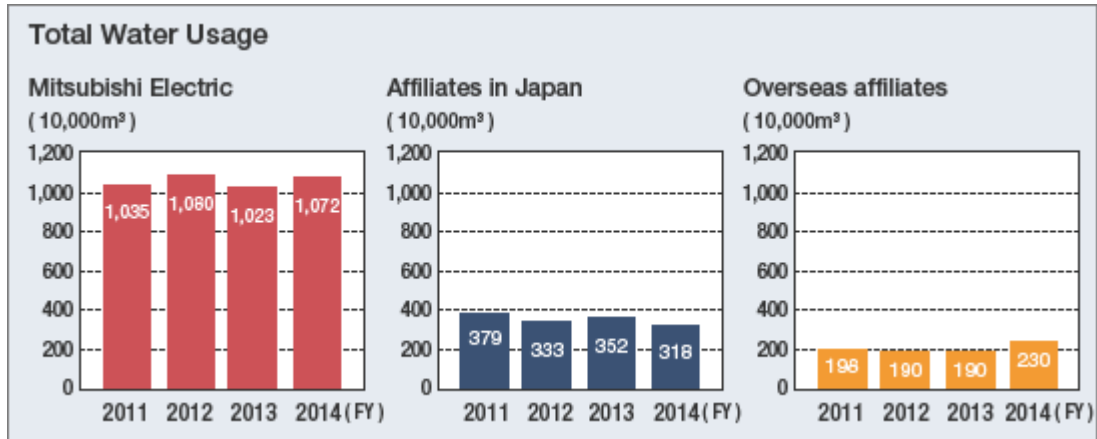
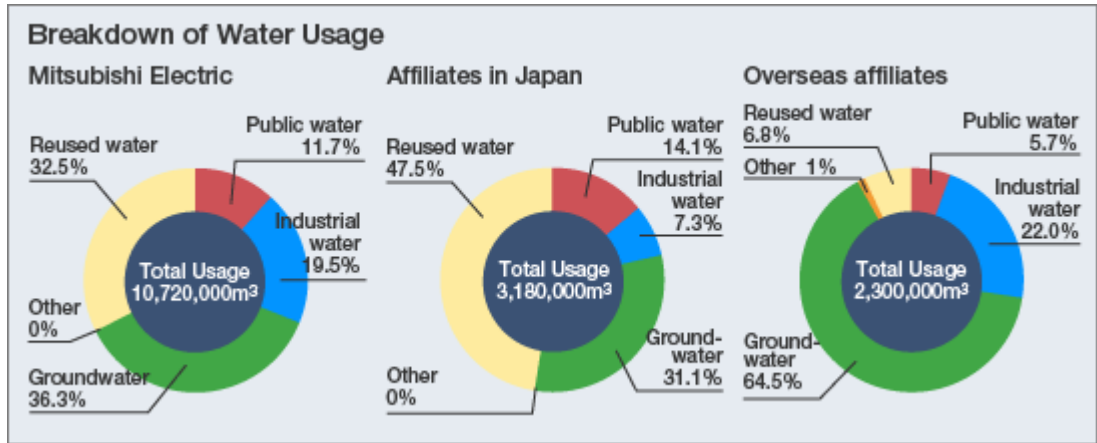




Reducing the Use of Disposable Packaging Materials

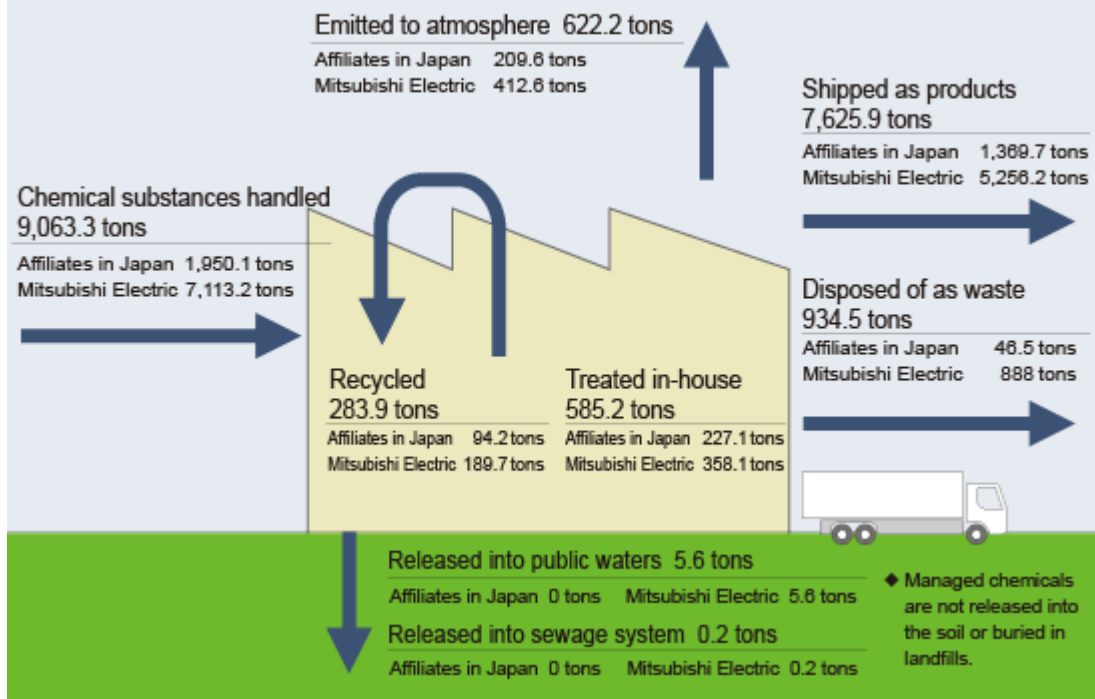


Using Water Effectively

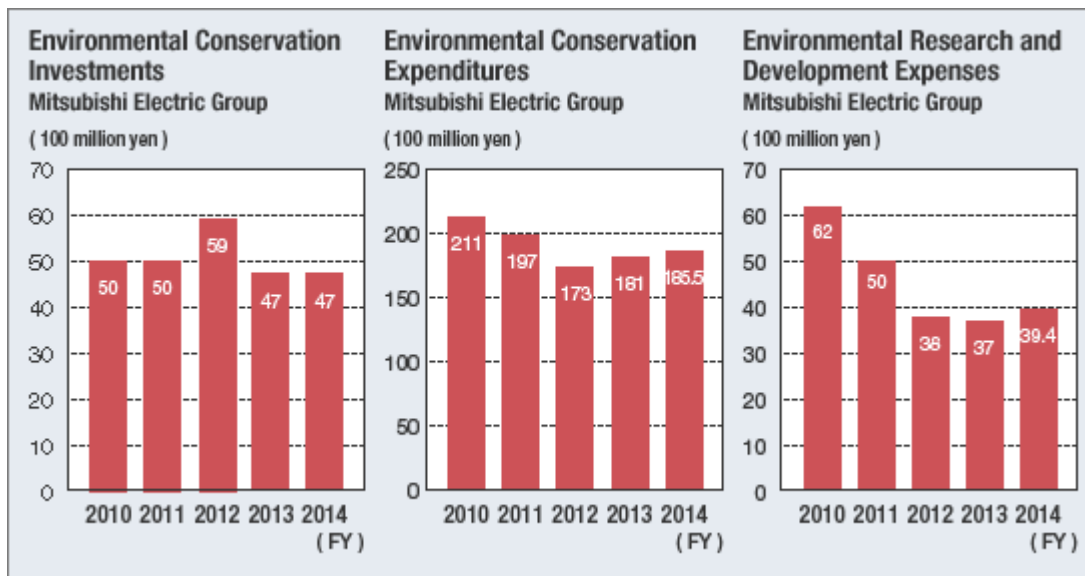


Managing Chemical Substances

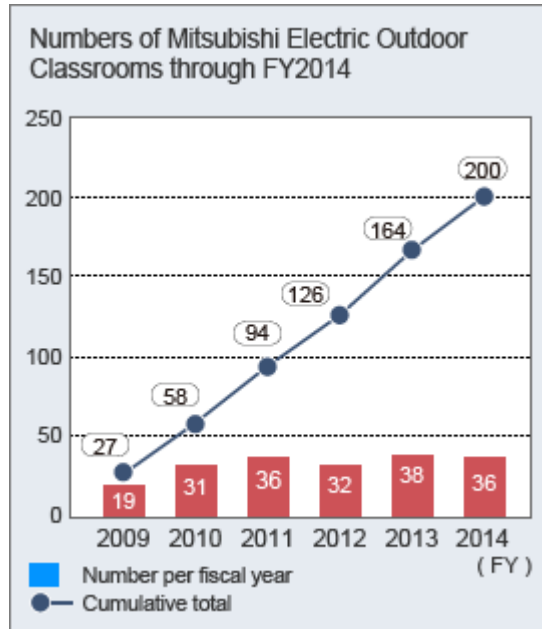
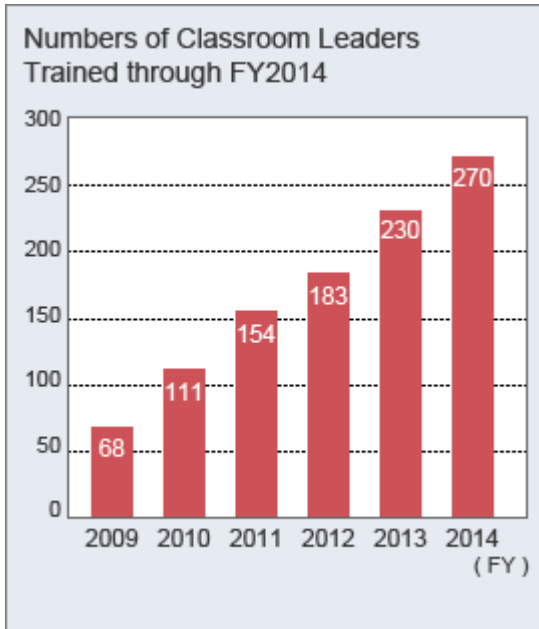
Material Balance of Chemical Substances Subject to Regulation



Environmental Accounting



Training of Environmental Personnel



Environment – Awards

Awards

Award	Sponsor	Accomplishment / Product	Recipient Company (Site)
10th Eco-Products Awards Grand Prize for Energy-Saving Product	Eco-Products Awards Steering Committee	Kirigamine Z Series room air conditioner	Mitsubishi Electric Corporation Shizuoka Works
2013 (7th) Kids Design Awards Designs for kids' future: Learning/Understanding category Kids Design Award	Kids Design Association	"Eco Guide TAB" 7-inch tablet monitor	Mitsubishi Electric Corporation
2013 (34th) Excellence in Energy-Conserving Equipment Award	The Japan Machinery Federation (JMF)	Centralized controller for low temperatures (MELTOUCH)	Mitsubishi Electric Corporation
2013 Energy Conservation Grand Prize Products and business models category ECCJ Chairman's Prize	The Energy Conservation Center, Japan (ECCJ)	Kirigamine Z Series room air conditioner	Mitsubishi Electric Corporation Shizuoka Works
2013 Energy Conservation Grand Prize Energy conservation examples category ECCJ Chairman's Prize	The Energy Conservation Center, Japan (ECCJ)	Energy-saving measures of Mitsubishi Electric eastern research center area	Mitsubishi Electric Corporation Information Technology R&D Center
45th Ichimura Industrial Awards Achievement Award	The New Technology Development Foundation	Technologies for precise sorting, recovery and reuse of plastics from home appliances helping to create a recycling-oriented society	Mitsubishi Electric Corporation Manufacturing Engineering Center
2013 (62nd) Electrical Industry Technology Achievement Awards Award for Outstanding Excellence	The Japan Electrical Manufacturers' Association (JEMA)	Application of GCT thyristor converter in development / commercialization of world's largest 450MVA self-exciting STATCOM	Mitsubishi Electric Corporation Transmission & Distribution Systems Center
2013 (62nd) Electrical Industry Technology Achievement Awards Manufacturing category Award for Excellence	The Japan Electrical Manufacturers' Association (JEMA)	Development of production system for assembly work in the electrical/electronics field	Mitsubishi Electric Corporation Advanced Technology R&D Center
2013 (62nd) Electrical Industry Technology Achievement Awards Honorable Mention Award	The Japan Electrical Manufacturers' Association (JEMA)	Development and practical implementation of next-generation power control system	Mitsubishi Electric Corporation Transmission & Distribution Systems Center and Information Technology R&D Center
2013 (62nd)	The Japan	Development of	Mitsubishi Electric

Electrical Industry Technology Achievement Awards Honorable Mention Award	Electrical Manufacturers' Association (JEMA)	Kirigamine ZW/ZXV Series air conditioners with function to immediately reduce power waste	Corporation Shizuoka Works and Advanced Technology R&D Center
2013 Electrical Worker Achievement Award	The Japan Electric Association Kanto Branch	Development of a variable magnetic flux motor for hybrid vehicles aiming to end dependence on rare earth metals	Mitsubishi Electric Corporation Advanced Technology R&D Center
2013 Kinki Local Commendation for Invention JIII Chairman's Honorable Mention Award	Japan Institute of Invention and Innovation (JIII)	Gasoline vapor recovery system for filling stations	Mitsubishi Electric Corporation Advanced Technology R&D Center, Sanda Works, Air Conditioning & Refrigeration System Works and Wakayama Works
2013 IEEJ Prize for Outstanding Technical Paper	The Institute of Electrical Engineers of Japan (IEEJ)	Application of voltage doubling rectifier operation in development of graded-control high-power-factor AC/DC converter	Mitsubishi Electric Corporation Advanced Technology R&D Center and Automotive Electronics Development Center
2013 IEEJ Prize for Outstanding Technical Paper	The Institute of Electrical Engineers of Japan (IEEJ)	Review of VCB and GCB high-frequency arc-extinguishing characteristics	Mitsubishi Electric Corporation
61st PFESE Awards PFESE Award	The Promotion Foundation for Electrical Science and Engineering (PFESE)	Realization of world's fastest elevator based on robust active vibration-damping technology	Mitsubishi Electric Corporation Advanced Technology R&D Center and Inazawa Works
2013 Resource Recycling Technology/System Award Minister of Economy, Trade and Industry Award	Japan Environmental Management Association for Industry (JEMAI)	Closed-loop recycling system for plastics from home appliances	Hyper Cycle Systems Corporation, Green Cycle Systems Corporation and Mitsubishi Electric Corporation
iF Product Design Award 2014	iF International Forum Design GmbH	Lossnay VL-100U5-E/VL-100EU5-E	Mitsubishi Electric Corporation

Environment – Initiatives toward Creating a Low-Carbon Society

▣ Reducing Greenhouse Gases Emitted in the Value Chain

International standards such as the Greenhouse Gas (GHG) Protocol and the Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, prepared by Japan's Ministry of the Environment, were referenced to calculate and report the amount of greenhouse gases emitted in fiscal 2014.

▣ Reducing CO2 from Product Usage

Introducing objectives and results of fiscal 2014 initiatives to promote energy-saving products that are helping to create a low-carbon society.

▣ Expanding Our Contributions to Reducing CO2 from Product Usage

An introduction to our contributions to reducing CO2 from product usage through replacing old products with highly energy-efficient products.

▣ Reducing CO2 from Production

Overview of measures to reduce CO2 emissions based on a sales unit ratio index target, fiscal 2014 initiatives and achievements, and plans for the future.

▣ Reducing Emissions of Non-CO2 Greenhouse Gases

Report on our use of three greenhouse gases and usage reduction measures and results of fiscal 2014.

▣ Reducing CO2 from Logistics

Overview of the Mitsubishi Electric Group's fiscal 2014 achievements in reducing CO2 emissions through just-in-time improvements to boost logistics efficiency.

Environment – Reducing Greenhouse Gases Emitted in the Value Chain

Measures to Comply with GHG Protocol Scope 3

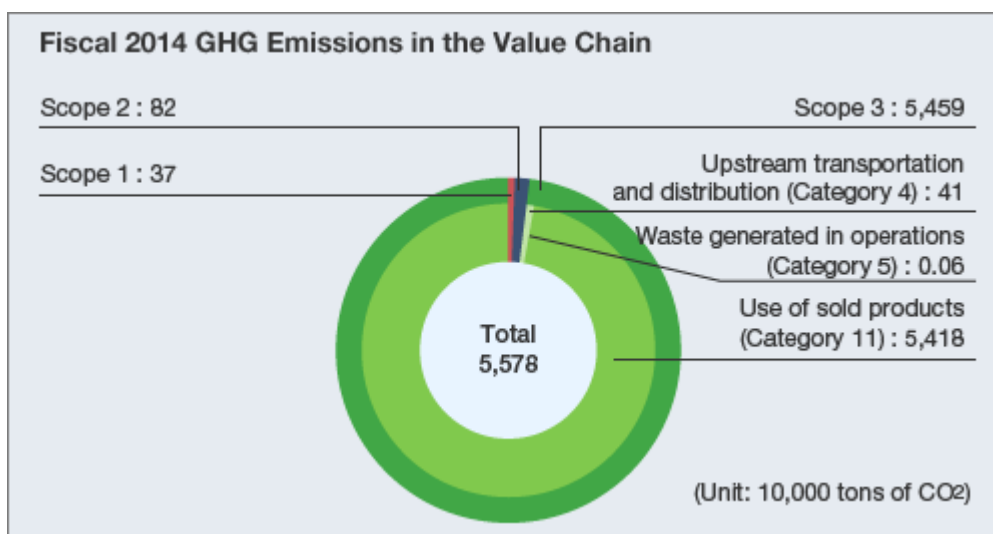
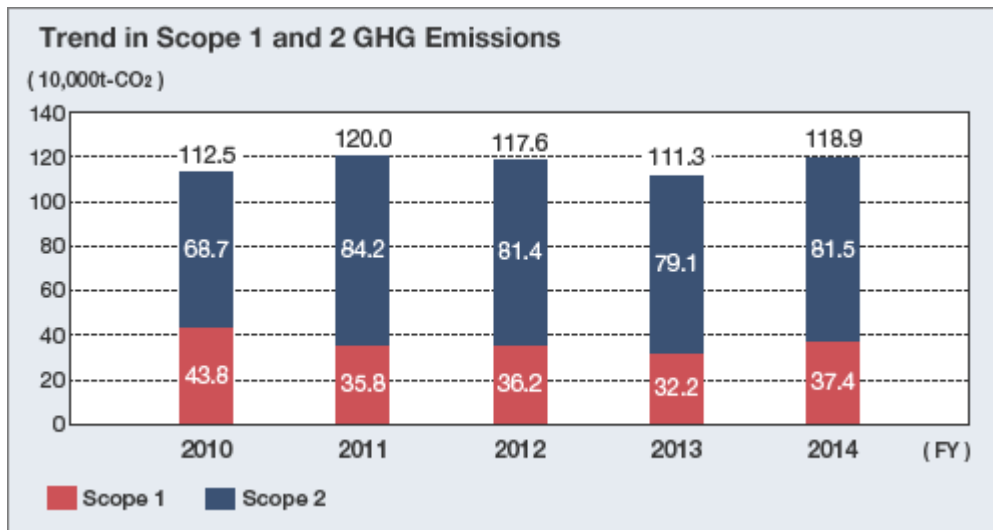
The Mitsubishi Electric Group refers to the Greenhouse Gas (GHG) Protocol, international standards relating to accounting for greenhouse gas emissions, and the Basic Guidelines on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, published by Japan's Ministry of the Environment, for determining how to account for emissions from business activities (Scope 1 and 2 of the GHG Protocol) and indirect emissions from outside the range of our business activities (Scope 3 of the GHG Protocol).

For Scope 3, only categories 4, 5, and 11 are shown in fiscal 2014, but we plan to increase the categories subject to accounting and widen the boundaries in the future.

Fiscal 2014 Greenhouse Gas Emissions

Four types of greenhouse gas (GHG) are emitted during the business activities of the Mitsubishi Electric Group: carbon dioxide (CO₂), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs). The fiscal 2014 GHG emission volumes for these gases are as follows.

Scope	Emissions (10,000t)	Accounting summary
Scope 1 Direct emissions from owned or controlled sources	37	CO ₂ , SF ₆ , PFC and HFC emissions from use of gas, heavy oil, etc., and product manufacturing
Scope 2 Indirect emissions from the generation of energy purchased and consumed by the Mitsubishi Electric Group	82	CO ₂ emissions from use of electricity, etc.
Scope 3 All other indirect emissions that occur in the value chain	5,459	–
Category 4 Upstream transportation and distribution	41	CO ₂ emissions from product distribution/circulation (sales distribution) Subject to accounting: 55 companies (production sites) consisting of Mitsubishi Electric, 33 affiliates in Japan and 21 overseas affiliates)
Category 5 Waste generated in operations	0.06	CO ₂ emissions from transportation of waste (waste distribution) Subject to accounting: Mitsubishi Electric
Category 11 Use of sold products	5,418	CO ₂ emissions from use of sold products (including SF ₆ emissions converted to a CO ₂ equivalent value) Subject to accounting: 97 end products subject to measures to reduce CO ₂ during product usage.



Owing to the fact that CO₂ emissions from "Use of sold products" (Scope 3, Category 11) account for almost all of the emissions in value chain, the Mitsubishi Electric Group focuses on developing highly energy-efficient products that are linked to reducing CO₂ emissions during product usage. At the same time, we strive to continuously reduce CO₂ emissions from production and the emission of gases with a higher global warming potential than CO₂.

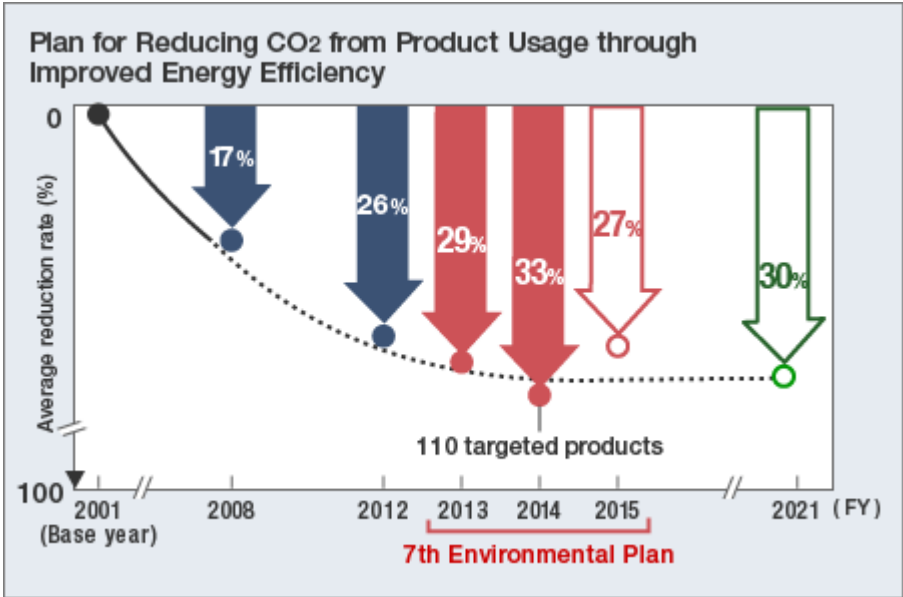
Environment – Reducing CO2 from Product Usage

Targets of the 7th Environmental Plan (Fiscal 2013 to 2015) and Fiscal 2014 Progress

In Environmental Vision 2021, the Mitsubishi Electric Group set a goal of reducing CO2 from product usage by 30%.

CO2 from product usage is viewed in terms of the power consumed by the customer during product usage and is taken as the CO2 emissions resulting from production of the power consumed. Raising the energy efficiency of products enables reduction of the CO2 during product usage. As part of the 7th Environmental Plan (fiscal 2013–2015), the Mitsubishi Electric Group is aiming for an average CO2 reduction ratio of 27% (as compared to fiscal 2001) for 84 products. These are specified products that Mitsubishi Electric can take the initiative in regarding design and development. Additionally, based on an analysis of the environmental aspects of these products, it is deemed that a reduction in CO2 emissions during use is important.

In fiscal 2014, for the 110 targeted products (97 end products and 13 interim products), the average reduction ratio was 33%, achieving and going beyond the target for the final fiscal year. For power devices (for consumers and electric railways) and lighting fixtures, impressive reductions continued. In fiscal 2015, we will continue working to maintain and improve the reduction ratio.



110 targeted products

Environment – Expanding Our Contributions to Reducing CO2 from Product Usage

Combined Domestic and Overseas Reduction Contributions: 28,200,000t from 99 End Products and 66,490,000t from Interim Products

In its 7th Environmental Plan covering fiscal 2013 to 2015, Mitsubishi Electric set a goal of expanding its contributions to reducing CO2 from product usage. To represent the amount of this reduction, we examine the amount of CO2 reduced as a result of switching from older products (those equivalent to products sold in fiscal 2001) to new, energy-efficient products (those from the fiscal year under review).

The calculation is done utilizing two assumptions: the case of contribution from direct reduction in the size of an end product, and the case of contribution from incorporating an interim product in a clients' end product. In order to increase our contribution to reducing CO2 in this manner, we are improving the energy-saving performance of individual products as a single unit and expanding the scale of sales.

Breakdown of Targeted Products

In total there are approximately 260 targeted products in the Mitsubishi Electric Group, including products that can be designed and developed under our initiative. Those products were analyzed considering product environmental aspects and how much they can contribute to reducing CO2 during product use, and it was found through provisional calculations that 130 products were specified as having major environmental aspects. If an industry-specific or public standard product usage calculation method exists, that calculating method is applied. If there is no method for calculating product usage specified, we establish our own usage scenario and calculate the level of contribution to reducing CO2. As for interim products, calculation is done by proportionally dividing product weight and sales volume ratio based on the Scope 3 guidelines of the GHG Protocol.

Breakdown of Products with Assessed Amount of Contributions to Reducing CO2 from Product Usage

Products (number)	Examples of products	Standard/Index considered for calculation
End products (99)	Plant monitoring control systems, railcar air-conditioning systems, onboard information systems (TIS, ATC, TIMS), monitor/protection control systems for power generation plants, particle therapy systems, circuit breakers, elevators, intelligent transport systems (ITS), satellite communications earth station facilities, optic/wireless access systems, air conditioners, televisions, refrigerators, Lossnay, processing machines, robots, lighting fixtures/lamps, IH cooking heaters, etc.	Contribution gained by reducing power consumed by the product
	Energy-saving support equipment, elevator modernization, Lossnay heat exchange amount	Suppression of power used by introducing energy-saving support equipment, contribution gained by upgrading to highly efficient components at the time of renewal, previously wasted energy that is now used by heat exchange
	Circuit breakers, switchgears	Reduction in amount of SF6 gas leaking (CO2 equivalent)
	Photovoltaic power generators, turbine generators	Amount of power generated by the generator minus the energy used when generating the power, increase in amount of power generated improving generation efficiency
Interim products (31)	Compressors purchased separately from air conditioners	Contribution by incorporating product that reduces power consumption
	Inverters, motors	Contribution by incorporating product that reduces power loss
	Devices	
	Electric power steering, alternators, starters	Contribution of fuel efficiency gained by incorporating product, proportionally divided based on weight
	Combined-cycle thermal power generator, nuclear power generator for overseas use	Contribution by proportionally dividing CO2 emission reduction from reducing fossil fuel use at the time of renewal/alternation of old thermal power generator, based on sales amount

- * Of the products targeted for calculating total CO₂ emissions and contributions to reducing CO₂ emissions, 63% are for domestic use and account for more than 70% of the products sold in Japan. The remaining 37% of the products are for overseas and includes some product components that are sold overseas (sales of more than 70% of interim products including devices and inverters, and end products such as air conditioners).
- * For the products using electricity, the CO₂ emission factor by country and region listed in CO₂ Emissions from Fuel Combustion Highlights (2013 Edition) is used.
- * For thermal power generators, the thermal power-source factor in the calculation method of the Action Plan for a Low-Carbon Society, published by an organization consisting of four electrical/electronic product manufacturers, is used.
- * For other energy use and greenhouse gases, the factor in the "Greenhouse Gas (GHG) Emissions Accounting and Reporting Manual," published by Japan's Ministry of the Environment and Ministry of Economy, Trade and Industry, is used.

Environment – Reducing CO2 from Production

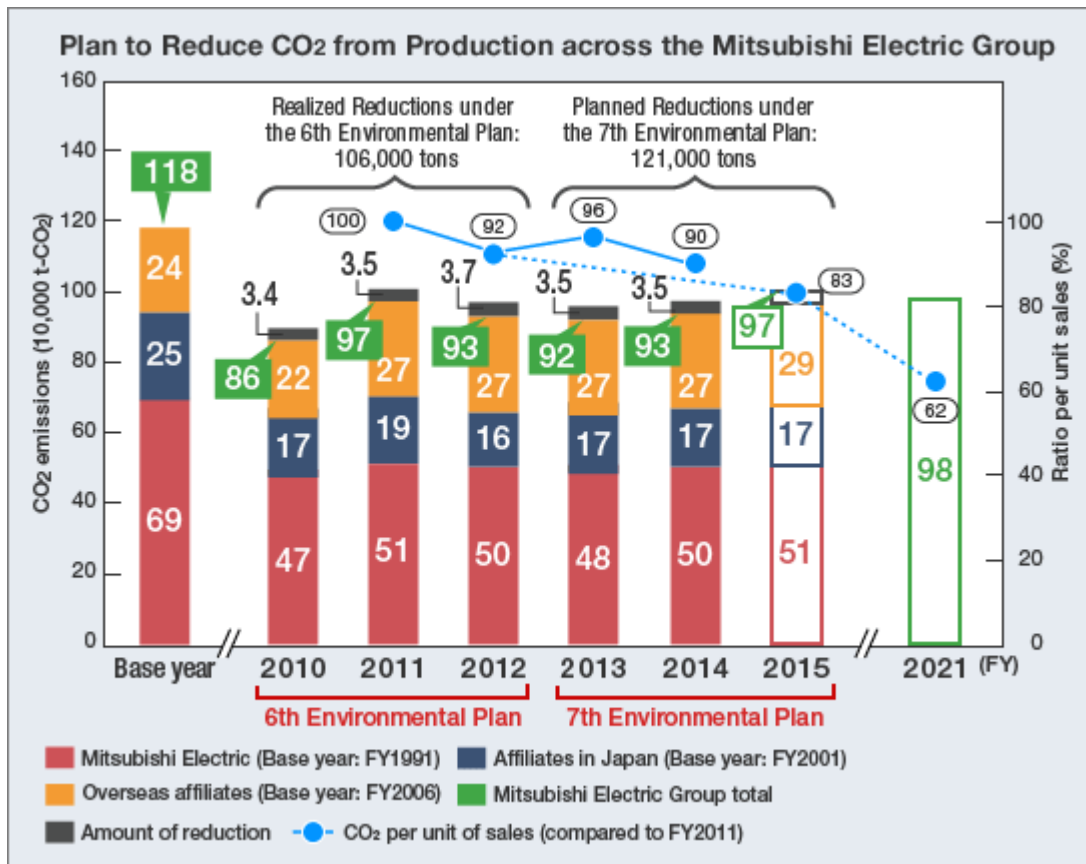
Summary of Fiscal 2014

The Mitsubishi Electric Group manages its goal for reducing CO2 emissions using a sales unit ratio index from the 7th Environmental Plan (fiscal 2013–2015). This makes it possible to evaluate reduction efforts correctly regardless of increases or decreases in productivity.

To reach our goal of improving the CO2 emissions per unit of sales to 83% compared to fiscal 2011 (a reduction of 17%), we are "reducing CO2 from production lines" by visualizing the energy wasted during production and promoting the "use and operation of highly efficient facilities equipment" such as air conditioning and lighting systems. We are also promoting "reduction activities through demand management" by introducing monitoring systems that manage and control peak power usage. Additionally, we are continually expanding the introduction of photovoltaic generation systems.

For fiscal 2014, we improved CO2 emissions per unit of sales to 90%, falling short of the fiscal year goal of 86%, but realizing an improvement of 6% compared to the 96% reported in fiscal 2013.

Looking to fiscal 2015, due to changes in the social environment since we drafted the 7th Environmental Plan, sales have failed to reach anticipated figures. Accordingly, these circumstances have made it difficult to achieve our per-unit-of-sales goal. Even so, we will continue with reduction efforts, aiming to make more progress than we did in the previous fiscal year.



Note

In preparing to announce the 7th Environmental Plan in fiscal 2013, the emission volumes of the base fiscal year and target fiscal year (2021) were revised.

- Base fiscal year: Revised from 1,140,000t to 1,180,000t (added proven values of three newly-targeted semiconductor production sites)
- Fiscal 2021: Revised from 830,000t to 980,000t (increased the forecast for domestic electricity emission factor from 0.33 to 0.42; 830,000t was the figure derived by reducing 30% from the total emissions of the base year)

The Four Reduction Measures of the 7th Environmental Plan (Fiscal 2013-2015) and Fiscal 2014 Progress

In order to make improvements and realize the sales unit ratio set as the goal in the 7th Environmental Plan, CO₂ reduction is promoted based on four perspectives.

The Mitsubishi Electric Group has also set a CO₂ emissions reduction target for items related to maintenance management, and assesses that volume continuously. It is assumed that CO₂ can be reduced by 121,000t in three years (fiscal 2013-2015); and based on the target of cutting 40,000t in fiscal 2014, a reduction of 35,000t was achieved.

1. Reducing CO₂ from Production Lines

With the goal of reducing CO₂ by 40,000t in three years as set forth in the 7th Environmental Plan, the result for fiscal 2014 was a reduction of 14,000t: 10,000t by Mitsubishi Electric itself, 1,000t by domestic affiliate companies and 3,000t by affiliate companies overseas.

The Mitsubishi Electric Group is working to eliminate the energy wasted in production lines. In fiscal 2014, members from Mitsubishi Electric's Manufacturing Engineering Center and members from various factories and production facilities were brought together to form a working group that conducted surveys related to energy-saving measures. More specifically, aiming to improve heating equipment, pneumatic and hydraulic equipment, and similar machinery, the working group investigated ways to improve manufacturing sites that utilize such equipment. Based on the survey conducted, actual improvements are to be implemented in fiscal 2015.

Other initiatives for improving production efficiency and saving energy were implemented, such as the introduction of original Mitsubishi Electric products like Eco Monitor and Eco Server. These devices monitor energy used in real time, and will be proactively promoted and introduced in new production lines during fiscal 2015 as well.

At affiliates in Japan where CO₂ emissions were high, "energy-saving diagnoses" were carried out and measures implemented based on the points found to require improvement. Additionally, a long-practiced policy of Mitsubishi Electric that requires results to be shared between production sites has been expanded to affiliates in Japan. Using this approach, the people in charge of environmental management at each factory and production facility gather together to share good examples from each site. This initiative of sharing good results will continue in fiscal 2015 as well.

Regarding overseas affiliates, energy-saving diagnoses have been carried out at three companies in China and Thailand where emissions were especially high. Technical support, such as indicating possible points to improve, was provided. In fiscal 2015, plans are to continue supporting improvements at the three companies and apply case examples to other sites.

2. Reducing CO₂ from Utilities

The goal in the 7th Environmental Plan is to reduce CO₂ by 56,000t within three years, and a reduction of 21,000t was achieved in fiscal 2014.

The Mitsubishi Electric Group is promoting the planned introduction of highly efficient equipment including the renewal of air-conditioning equipment and transformers, and the replacement of mercury lamp/office lighting with LEDs. The Group is also proactively introducing high-efficiency machinery as equipment for new buildings and other structures. In fiscal 2014, accompanied with boiler renewal, work will continue on reducing the use of energy other than electricity. This will include initiatives such as switching from heavy oil to city gas composed mainly of natural gas, which will result in reducing CO₂ emissions, and introducing steam drain exhaust heat recovery and the use of heat-retentive piping. In fiscal 2015, we will newly promote energy savings for office equipment, including the renewal and integration of servers and the substitution of thin clients.

Example of Reducing CO₂ Emissions by Introducing Highly Efficient Equipment (Power Device Works)

Various highly efficient machines were installed in the PI Building upon its completion at the Power Device Works in March 2014. A number of Mitsubishi Electric energy-saving products were actively introduced into the building, including LED lighting fixtures with human/illumination-sensing features, high-efficiency transformers and more. A vaulted ceiling enables the use of natural sunlight to illuminate the interior, and there's a light shelf that reflects sunlight up to the ceiling. There is also a natural ventilation system that automatically opens/closes windows and stops/starts the air-conditioning system based on monitoring indoor- and outdoor-air conditions.

The reduction in power consumption realized through these investments, combined with other eco-conscious items, resulted in the Works being accredited an "S" ranking from CASBEE Fukuoka—Fukuoka City building environment ranking system—the first time for Mitsubishi Electric. Plans are in place to introduce a photovoltaic generation system and start the visualization of energy use in fiscal 2015.



Power Device Works

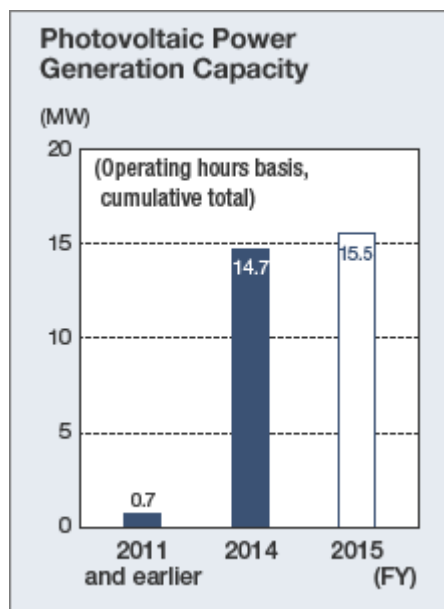
3. Reducing CO2 through Demand Management

The Mitsubishi Electric Group began introducing the Demand Monitoring System, an integrated management system for peak power usage, in fiscal 2012. As of fiscal 2013, this system is being utilized by all 68 domestic Group sites* that have large electrical power contracts (i.e., contracts for 500kW or more), enabling the simultaneous visualization of power demand at multiple sites, and batch monitoring and management of operations. Additionally, a real-time monitoring function for photovoltaic power generation was added to each site in the summer of 2013, making it possible to manage operations for peak power containment based on power generation scale. As a result of these management capabilities making it possible to set the optimum target value based on data analysis and share information with other sites, the plan is to reduce CO2 emissions by 11,000t and cut energy costs over the three-year 7th Environment Plan.

* The 68 Group sites with large power contracts account for 80% of the total CO2 emitted by the Mitsubishi Electric Group.

4. Expanding the Installation of Photovoltaic Systems

The Mitsubishi Electric Group plans to be generating a total of 15.5MW of power among domestic Group members by the end of fiscal 2015. The photovoltaic systems introduced up to fiscal 2011 and the Great East Japan Earthquake generated 0.7MW based on actual operation. However, following the proactive introduction activities after the earthquake, total power generated in-house by fiscal 2014 rose to 14.7MW. The CO2 emitted has been reduced 5,500t, which is near the goal of 6,000t set to be achieved during the three years of the 7th Environmental Plan. As for overseas affiliates, an 80kW photovoltaic system was introduced at Siam Compressor Industry Co., Ltd. (Thailand) in fiscal 2014, and the plan is to continue expanding the utilization of such systems.





Photovoltaic system introduced at Siam Compressor Industry Co., Ltd.



Ceremony commemorating the commencement of power generation

Outlook for CO2 from Production across the Mitsubishi Electric Group

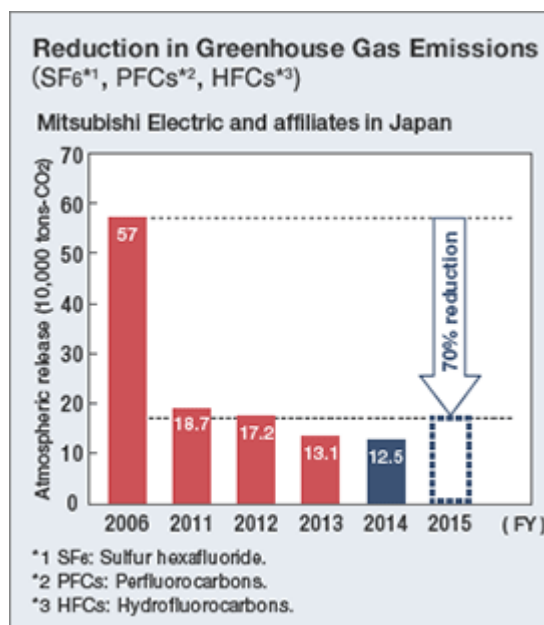
In Relation to Reducing CO2 from Production (Environmental Vision 2021)				
Total CO2	Total CO2 emission predicted for fiscal 2014 under the 7th Environmental Plan	Fiscal 2013	Fiscal 2014	Self-evaluation
Group overall	1,000,000 tons	920,000 tons	934,000 tons	😊
Mitsubishi Electric	530,000 tons	480,000 tons	501,000 tons	😊
Affiliates in Japan	190,000 tons	170,000 tons	157,000 tons	😊
Overseas affiliates	280,000 tons	270,000 tons	266,000 tons	😊
Amount of reduction	CO2 reduction envisioned for three years under the 7th Environmental Plan	Fiscal 2013	Fiscal 2014	Self-evaluation
Group overall	121,000 tons (3 years)	35,000 tons (single fiscal year)	35,000 tons (single fiscal year)	😊
Mitsubishi Electric	69,000 tons (3 years)	16,000 tons (single fiscal year)	20,000 tons (single fiscal year)	😊
Affiliates in Japan	24,000 tons (3 years)	5,000 tons (single fiscal year)	4,000 tons (single fiscal year)	😊
Overseas affiliates	28,000 tons (3 years)	14,000 tons (single fiscal year)	11,000 tons (single fiscal year)	😊

Environment – Reducing Emissions of Non-CO2 Greenhouse Gases

Targets of the 7th Environmental Plan (Fiscal 2013–2015) and Fiscal 2014 Progress

Non-CO2 greenhouse gases emitted by the Mitsubishi Electric Group during its business activities include sulfur hexafluoride (SF6, an electrical insulating gas used in gas-insulated switchgears), perfluorocarbons (PFCs, used as etching gas in the production of semiconductors and liquid crystals), and hydrofluorocarbons (HFCs, gases used as refrigerants in air conditioners and refrigerators). As these gases produce a greenhouse effect hundreds or even tens of thousands of times greater than that of CO2, we are making efforts to reduce their use.

Our 7th Environmental Plan (fiscal 2013-2015) aims to reduce the CO2 equivalent of these gases by 10% compared with fiscal 2011 and 70% compared with fiscal 2006, doing so through measures that include an improved gas collection rate, enhanced operational management and helium leak testing.



Comparison of Global-Warming Potential of CO2, SF6, PFCs and HFCs

SF6	23,900
PFC	6,500-9,200
HFC	140-11,700

* Value for CO2 = 1

Achievements in Fiscal 2014

One of the goals of the 7th Environmental Plan is for Mitsubishi Electric and affiliates in Japan to reduce the use of greenhouse gases by 70% compared to the levels used in fiscal 2006—a target that was actually achieved in fiscal 2012. Even though production increased in fiscal 2014, by strictly enforcing measures in a planned manner, the amount of greenhouse gases emitted was contained to the equivalent of the previous year. We will continue to enforce measures that have been introduced, increase the use of recovery equipment and implement other initiatives as we work to further reduce emissions in the mid- to long-term.

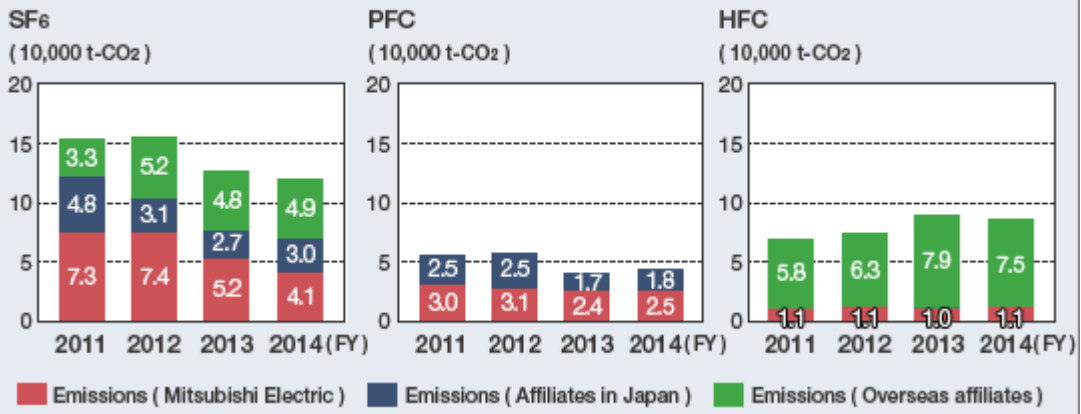
Regarding the amount of SF6 emitted in fiscal 2014, gas recovery performance has been improved as a result of redesigning recovery equipment, and the monitoring of daily gas leakage and recovery have been enhanced, resulting in a total of 71,000t-CO2.

As for the amount of PFCs emitted, the introduction of removal equipment and the practice of converting PFCs into a gas with lower warming potential are being promoted in a phased manner. As the result, PFC emissions totaled 43,000t-CO2.

Concerning the amount of HFCs emitted, as a result of the introduction of a gas detoxifying treatment system and other activities the total came to 11,000t-CO2.

In the case of overseas affiliates, production bases carried out planned initiatives, understanding the details regarding the circumstances of emission volumes in fiscal 2014. Full-scale reduction will be promoted in the 8th Environmental Plan (fiscal 2016–2018). In preparation, during fiscal 2015, we will conduct recovery/disposal surveys overseas and provide direction based on measures implemented and proven in Japan.

Emissions of Non-CO₂ Greenhouse Gases



Environment – Reducing CO2 from Logistics

Basic Policies on Logistics

The Mitsubishi Electric Group carries out just-in-time improvement activities to improve logistics. These activities quantify logistics work to make it transparent, opening the door to greater efficiency and economy by eliminating irrational, irregular and wasted efforts. We are also working to reduce environmental impact via "Eco-Logistics" (Economy & Ecology Logistics).

Fiscal 2014 Achievements of the Mitsubishi Electric Group

(Mitsubishi Electric and affiliates in Japan)

Shipping volume unit: 0.0334t-CO2/million yen (2.7% reduction compared to the previous year)

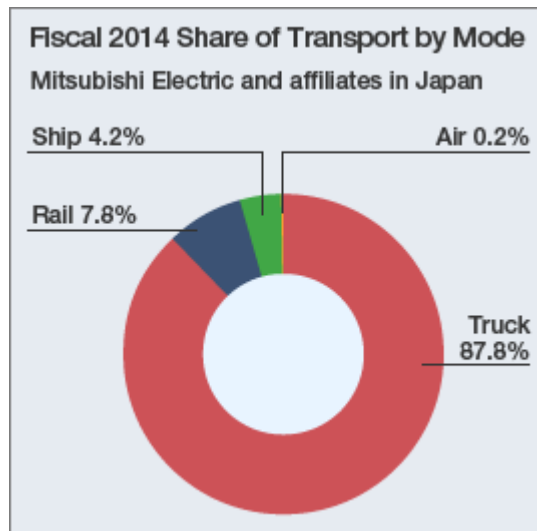
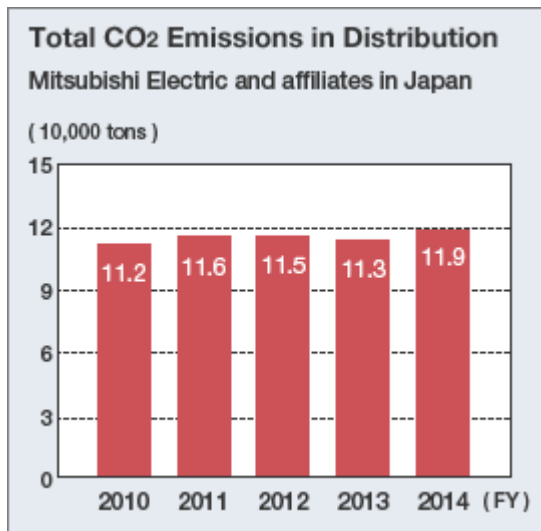
CO2 emitted: 119,000t (6,000t increase compared to the previous year)

The Company and its affiliates in Japan continued to carry out the following measures throughout fiscal 2014.

- Reducing the number of trucks by improving load ratios
- Implementing modal shift from truck transport to rail and marine transport

Due to an increase in shipping during fiscal 2014, the amount of CO2 emitted by the Mitsubishi Electric Group rose to 101,000t (up 6,000t, a 7% increase compared to the previous year). The amount emitted by affiliates in Japan totaled 18,000t, approximately the same as the previous year.

Regarding overseas affiliates, a total of 21 companies collected data throughout fiscal 2014. The amount of CO2 emitted was 292,000t. Compared to the 248,000t emitted the previous fiscal year, CO2 emissions increased 44,000t, owing to an increase in international distribution.

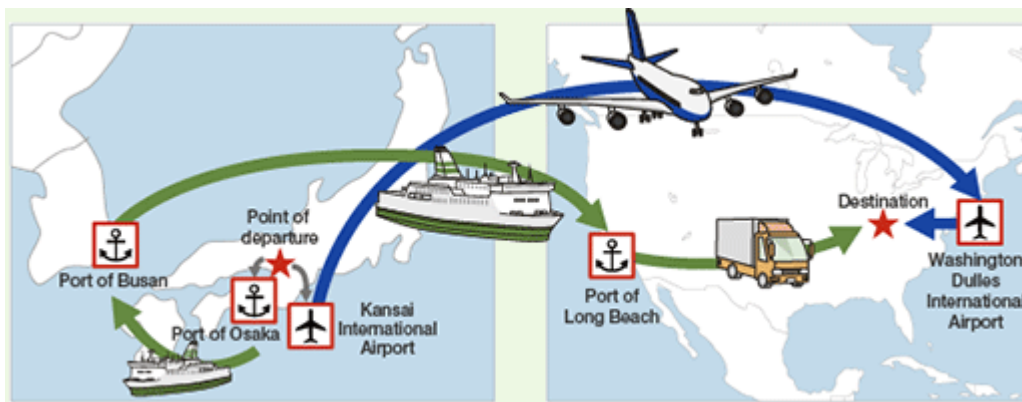


[Introduction of Activities] Promoting activities to reduce CO2 emissions during international distribution by switching from airfreight to marine transport

In principle, marine transport is used to ship products overseas from Japan. However, in cases where faster delivery is required, like the urgent delivery of products such as semiconductors, shipping is via airfreight or other means.

When shipping products, if there is no need for urgent delivery and marine transport can be used, CO2 can be reduced. However, in the case of semiconductor products, there is a possibility that environmental conditions such as temperature, humidity and vibration could affect product quality. Especially when considering long-distance marine transport followed by long-distance truck transport, the environmental conditions during transport are considerably worse than those when using airfreight and short-distance truck delivery. As a result, until now it has been thought that long-distance marine and truck transport are not appropriate for shipping semiconductor products.

However, members of the Mitsubishi Electric Group investigated the environmental conditions for all long-distance marine and truck transport routes, and confirmed that no problems existed. Today, semiconductors exported to North America are classified into two categories: "Urgent" and "Other". By switching the means of transport from airfreight to marine transport, we succeeded in suppressing CO2 emission to less than 1/10 of that previously emitted. For this initiative, based on the assumption that marine transport to North America takes 36 days—five times longer than airfreight—North American distributors specified the products that could be switched to marine transport. We also shared shipping information in order to prevent misappropriation and clarified the environmental conditions of the shipping routes. As a result, in addition to securing a certain level of distribution quality, we have been able to realize a reduction in the CO2 emitted during transport.



Environment – Initiatives toward Creating a Recycling-Based Society

▣ Reducing Use of Resources

Introducing objectives and results of fiscal 2014 initiatives to reduce the size and weight of products while promoting product recycling in an effort to realize a recycling-based society.

▣ Recycling End-of-Life Products

Objectives and progress of initiatives to collect and recycle four kinds of home appliances and personal computers, and fiscal 2014 achievements.

▣ Initiatives toward Zero Final Waste Disposal Ratio

Priority measures of efficient resource usage and the target for final waste disposal ratio, and fiscal 2014 achievements.

▣ Reducing the Use of Disposable Packaging Materials

Overview of the Mitsubishi Electric Group's goals to reduce resource inputs through the 3Rs applied to packaging materials, and fiscal 2014 initiatives and achievements.

▣ Using Water Effectively

Our views on the effective use of water, and the Mitsubishi Electric Group's achievements in fiscal 2014.

Environment – Reducing Use of Resources

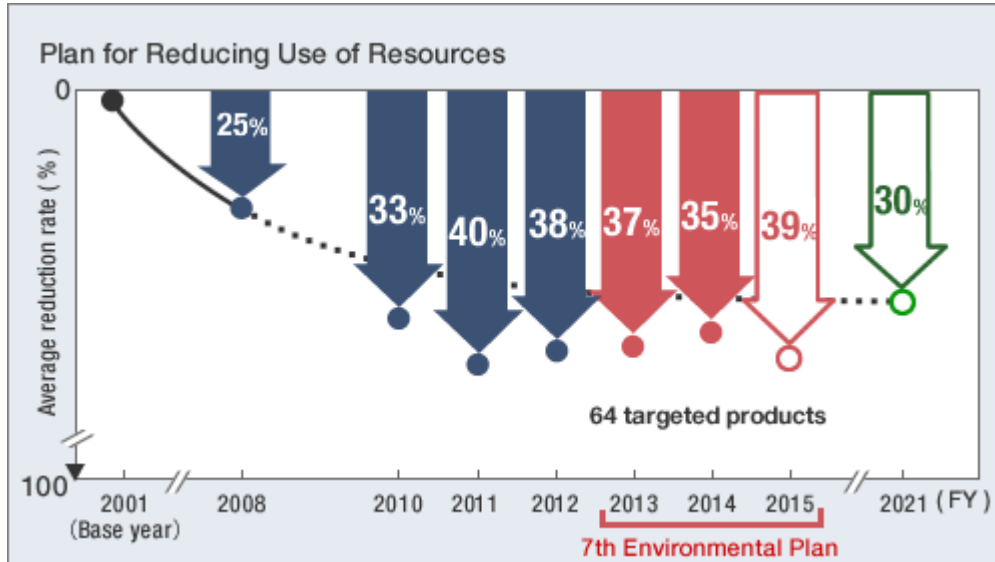
Targets of the 7th Environmental Plan (Fiscal 2013-2015) and Progress in Fiscal 2014

To help in creating a recycling-based society, the Mitsubishi Electric Group's Environmental Vision 2021 sets targets for reducing our input of resources. We are now undertaking activities to reduce resource input in a number of targeted products that we identified in fiscal 2010. Specifically, we have set a target of an average 39% reduction rate (compared with fiscal 2001) in resource input for 64 products targeted under the 7th Environmental Plan (fiscal 2013-2015). Products manufactured to customer specifications and one-off individually manufactured products are not targeted by these resource input reduction initiatives.

In fiscal 2014 we achieved an average 35% reduction rate for the 64 products targeted. Although improvement in the average reduction rate has slowed for three years straight, reduction in resource input for individual products has proceeded steadily. The lower index figure is due to slower sales of LCD televisions that had buoyed improvements in the rate and the continued increase in sales of products requiring heavy resource input such as heavy electrical machinery and industrial mechatronics products. Although the average reduction rate is affected by the details of our business, we will maintain our target, increase products that boost the reduction rate and work towards further reductions for all products.

Products Making Notable Progress in Resource Reduction in Fiscal 2014 Compared to the Previous Year

Thermal power generation plant instrumentation and control equipment: Reduction rate improved 15%
 Automatic platform gates: Reduction rate improved 10%
 Hot-water supply system equipment: Reduction rate improved 6%
 Electromagnetic switching devices: Reduction rate improved 5%
 Package air conditioners: Reduction rate improved 2%



Note

Following confirmation of a calculation error, previous data has been recalculated.

Environment – Recycling End-of-Life Products

Recycling Four Kinds of Home Appliances

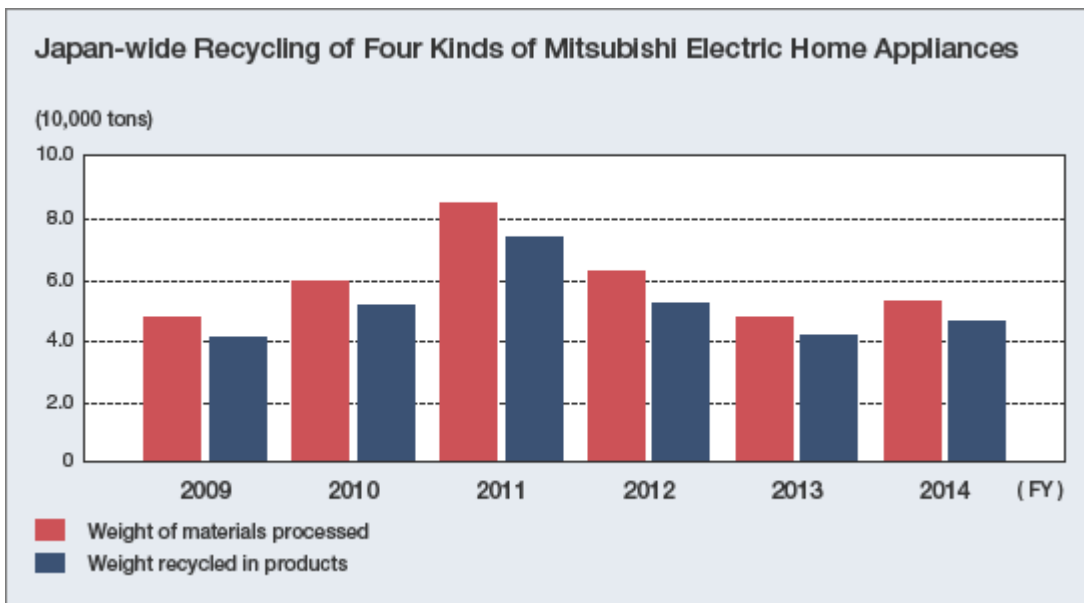
Japan's Home Appliances Recycling Law* makes the collection and recycling of four kinds of appliances mandatory: air conditioners, television sets (CRT, LCD and plasma models), refrigerators/freezers and washing machines / tumble dryers.

In 1999, Mitsubishi Electric commenced operations at a recycling plant, Hyper Cycle Systems Corporation (HCS), the first in the industry. By the end of fiscal 2014, HCS had recycled 630,000 tons of material. The results for the collection and recycling of four kinds of Mitsubishi Electric home appliances in fiscal 2014 are shown in the accompanying graph.



Each year Mitsubishi Electric organizes a program of technical seminars covering environmentally conscious design in conjunction with HCS, in an effort to promote the design of products that are easier to recycle. We will continue this program and use feedback from the seminars in product design, while also expanding their application to products under the 7th Environmental Plan (fiscal 2013-2015) by developing technologies for the separation of collected materials and the practical application of recycled materials.

* Home Appliance Recycling Law (April 2001): This law obliges stakeholders to collect and recycle home appliances such as air conditioners, television sets, refrigerators, washing machines and others. Manufacturers and importers must recycle steel, copper, aluminum, glass, plastic and other materials and they are also responsible for setting up a system to recycle their products. The law was amended in December 2008 to also include LCD and plasma televisions, as well as tumble dryers.



The Collection and Recycling of Four Kinds of Home Appliances at Home Appliance Recycling Plants (Fiscal 2014)

	Unit	Air Conditioners	Television Sets		Refrigerators / Freezers	Washing Machines / Tumble Dryers	Total
			CRT	LCD / Plasma			
Recovered units at collection points	1,000 units	415	157	14	415	237	1,241
Treated units	1,000 units	388	152	13	383	224	1,161
Treated weight	Tons	15,939	3,985	260	24,487	8,009	52,682
Recycled weight	Tons	15,142	3,182	236	20,113	7,551	46,227
Recycled ratio (Sold material ratio)	%	95	79	90	82	94	87

Recycling Personal Computers

Mitsubishi Electric promotes the recycling of used computers and monitors. In fiscal 2014, we collected a total of 15,096 household- and industrial-use computers, which represented a recycling rate of 76.7%.

For end-of-life household-use computer equipment we have implemented a plan of marking used computers with a PC Recycle Mark*1 tag to waive the disposal fee. For some products, customers are required to register equipment after purchase in order to get the tag themselves, but the procedure is very straightforward. Mitsubishi Electric has made it possible for customers to obtain recycling tags by sending a postcard or requesting one via the Internet*2. When we receive a disposal request for a product sold in October 2003 or later, we determine whether the product is eligible for a recycling tag to ensure the customer does not pay the recycling fee twice.

There is a risk of data leakage from the hard disk drives of disposed computers. Although computer users have the basic responsibility for preventing data leaks, the companies we have contracted to recycle computers punch holes in the hard disk drives or use a strong magnet to destroy any data physically and magnetically, in order to prevent any confidential data from being leaked. Interested computer owners can also pay for a program to delete all data completely before their used computers are taken away.

Notes

*1 PC Recycle Mark: The recycle mark stipulated by industry group PC3R Promotion Association was established to promote the 3Rs (reduce, reuse, recycle) among manufacturers, distributors and importers of computers and monitors. From October 2003 onward they began targeting household personal computer and monitor users. The tag may be displayed on products at the time of purchase or available afterward through registration.

*2 Because Mitsubishi Electric stopped selling home-use PCs in fiscal 1999, the Recycle Mark is available only for PC displays.

Material Recycling from Used Computers (Household and Industrial Use) (Fiscal 2014)

	Unit	Desktops		Notebooks		CRT Displays		LCDs		Total	
Collected weight	Tons	17.3		3.7		58		53.9		133	
		Office	Home	Office	Home	Office	Home	Office	Home	Office	Home
		15.9	1.5	3.5	0.2	6.4	51.6	25.6	28.3	51.4	81.6
Collected units	Units	1,791		1,515		2,800		8,990		15,096	
		Office	Home	Office	Home	Office	Home	Office	Home	Office	Home
		1,671	120	1,452	63	311	2,489	4,266	4,724	7,700	7,396
Treated weight	Tons	17.3		3.7		58		53.9		133	
Recycled weight	Tons	14.5		2.9		37.8		46.8		101.9	
Recycling ratio	%	83.5		77.8		65.1		86.8		76.7	

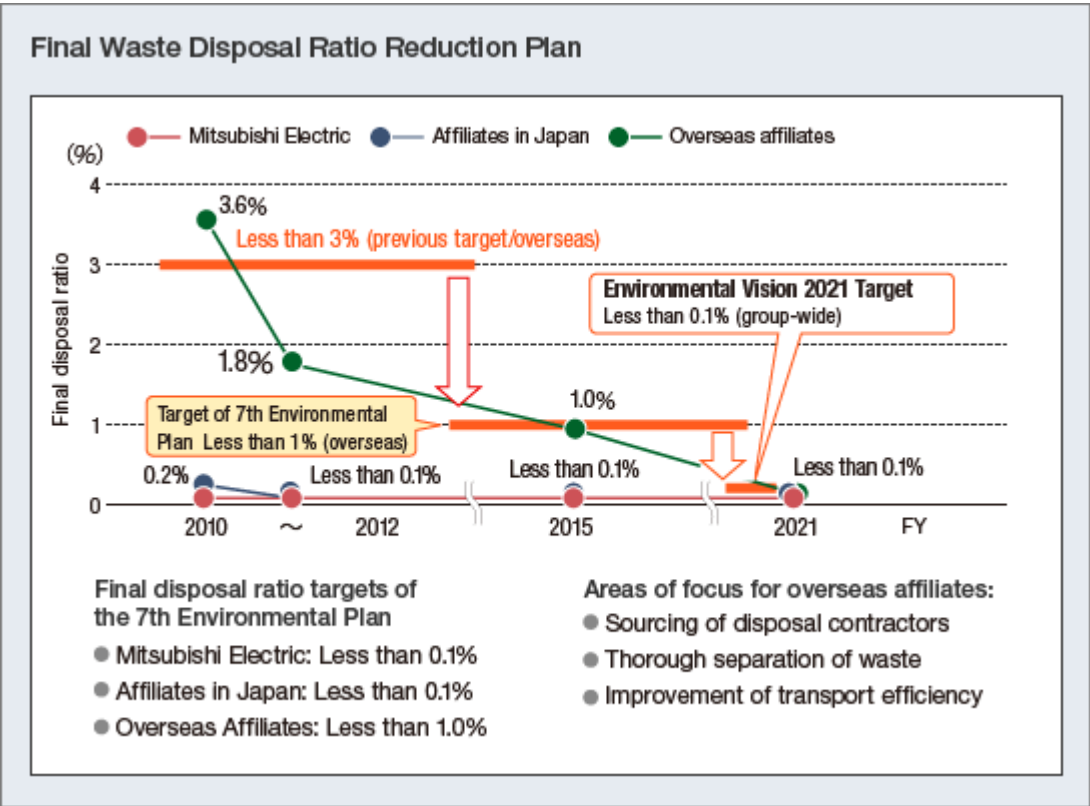
* Including all-in-one computers

Environment – Initiatives toward Zero Final Waste Disposal Ratio

Targets of the 7th Environmental Plan (Fiscal 2013-2015) and Fiscal 2014 Progress

Mitsubishi Electric and its affiliates in Japan are working to thoroughly analyze and separate the waste we generate so as to sustain our level of final waste disposal under the targets of the 7th Environmental Plan (fiscal 2013-2015). In fiscal 2015, we will continue to sustain the previously achieved target of under 0.1% through initiatives such as improving the efficiency of waste transportation and converting waste to materials with commercial value.

For overseas affiliates with high levels of final disposal, we have set a target of less than 1.0% under the 7th Environmental Plan. We are thoroughly analyzing and separating waste at these affiliates, promoting the mitigation of waste generation and sourcing recycling contractors.



Priority Measures under the 7th Environmental Plan (Fiscal 2013-2015)

1. Thorough Analysis and Separation of Waste

By analyzing and determining types of waste that can be converted to materials of commercial value at our sites, we are able to conduct thorough separation and conversion.

2. Sourcing Disposal Contractors

By sharing information about waste disposal contractors between Mitsubishi Electric and its affiliates in Japan, we continue to promote and achieve a higher level of conversion to materials with commercial value.

At our overseas affiliates, we are aiming for the mitigation of waste generation and conversion to materials with commercial value through thorough separation activities. To this end, we are confirming processing conditions for each region and working to collect information to aid in sourcing waste disposal contractors.

3. Improving Transport Efficiency

Mitsubishi Electric and its affiliates in Japan are promoting cooperation between production sites located near each other and more efficient waste (recycling) distribution.

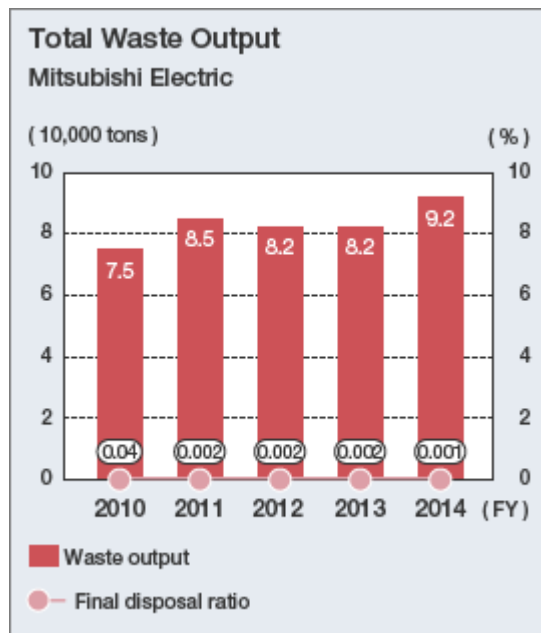
Mitsubishi Electric's Targets and Fiscal 2014 Achievements

Final Waste Disposal Ratio Improved to 0.001%, Clearly Achieving the Target

As production sites that manufacture different products also generate different types of waste, Mitsubishi Electric addresses waste under the principle of creating plans specific to each site. However, our sites in neighboring regions cooperate in sharing their information and management expertise concerning disposal contractors.

Through such efforts, in spite of total waste emissions in fiscal 2014 increasing to 92,000 tons due to increasing production volumes and building renovation, our final disposal ratio improved to 0.001%.

Moreover, in fiscal 2014, we introduced our original waste management system at all 26 sites. The system prevents human error and has an automatic checking function, which has benefits such as preventing manifest errors, thus leading to enhanced legal compliance.

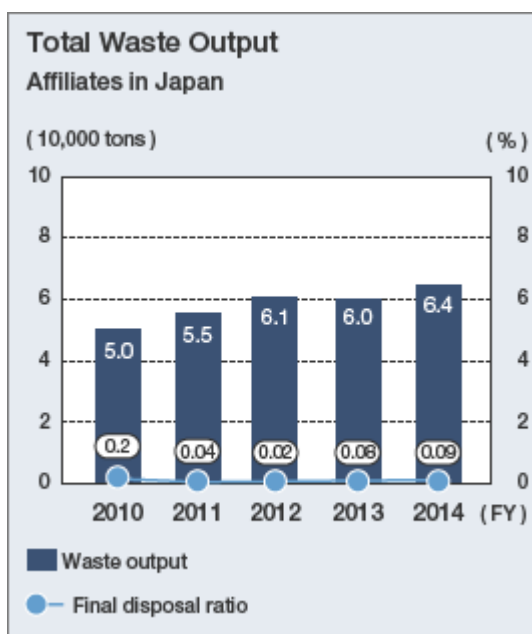


Targets and Fiscal 2014 Achievements for Affiliates in Japan

Final Disposal Ratio Increased 0.09% Compared to Previous Fiscal Year, Achieving 7th Environmental Plan Target of Less than 0.1%

Looking at our affiliates in Japan in fiscal 2014, factors including an increase in waste containing asbestos from discontinued facilities and an increase in production resulted in a final waste disposal of 64,000 tons and a final disposal ratio of 0.09%. This is only a slight increase compared to the previous fiscal year, but nevertheless enables us to achieve the target of the 7th Environmental Plan.

We will continue promoting Mitsubishi Electric's waste management activities in the future, sharing expertise and information, raising the level of waste separation and promoting conversion to materials of commercial value.



Targets and Fiscal 2014 Achievements for Overseas Affiliates

With a Final Disposal Ratio of 1.04%, We Are Moving Steadily Toward the 7th Environmental Plan Target of Less Than 1.0%

For our overseas affiliates in fiscal 2014, final waste disposal was 61,000 tons, resulting in a final disposal ratio of 1.04%, which is a 0.51% improvement from 1.55% in fiscal 2013.

Regarding overseas affiliates, because laws, regulations and waste treatment conditions differ among countries and regions, Mitsubishi Electric confirms the processing conditions for each region and develops necessary measures for each overseas affiliate through its auditing activities. To promote the conversion of waste to materials with commercial value, a necessary component in reducing final waste, we will share information on best practices, waste separation and collection methods with waste disposal contractors among our overseas affiliates via ongoing overseas key personnel training, as we take further steps to secure waste disposal contractors.



Environment – Reducing the Use of Disposable Packaging Materials

Mitsubishi Electric Group's Fiscal 2014 Achievements

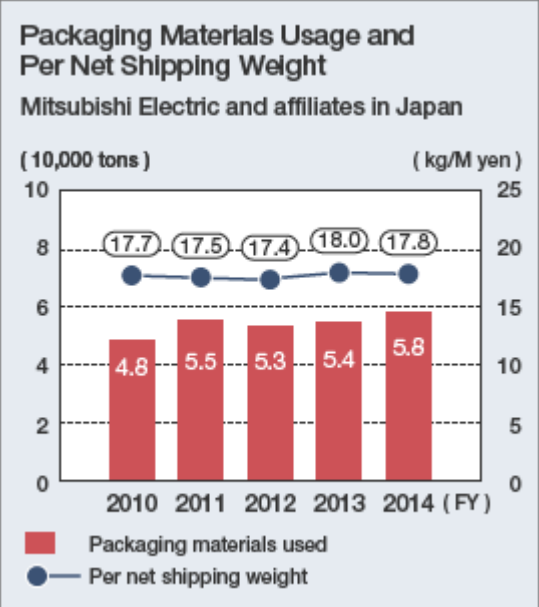
The Mitsubishi Electric Group is improving its logistics work as a part of its just-in-time improvement activities. In this area, we have set a basic principle of reducing the weight of the transport packaging while ensuring safe delivery of our products to customers. Under this concept, we are advancing the 3Rs of packaging: Reduce (simplify packaging), Reuse (expand the use of returnable containers and packaging), and Recycle (recycle used packaging materials).

Mitsubishi Electric and Affiliates in Japan

- **Packaging requirements per volume shipped: 17.8kg/million yen (1.1% reduction compared to previous fiscal year)**
- **Packaging volume used: 58,000t (4,000t increase compared to previous fiscal year)**

For Mitsubishi Electric and affiliates in Japan, the higher packaging volume used is the direct result of an increase in the volume of shipments. Packaging requirements per volume of shipment decreased owing to packaging simplification and expansion in the application of returnable containers.

At our overseas affiliates, the use of packaging materials by 21 companies totaled 109,000t.



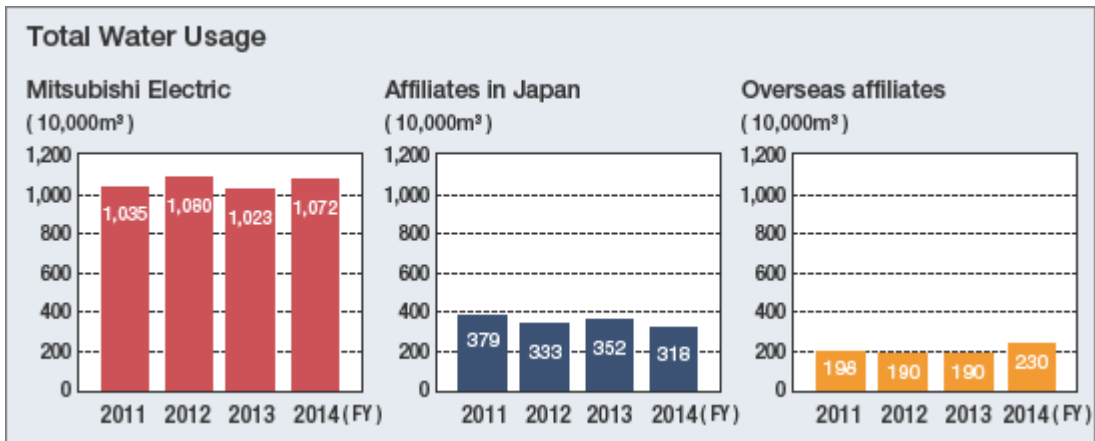
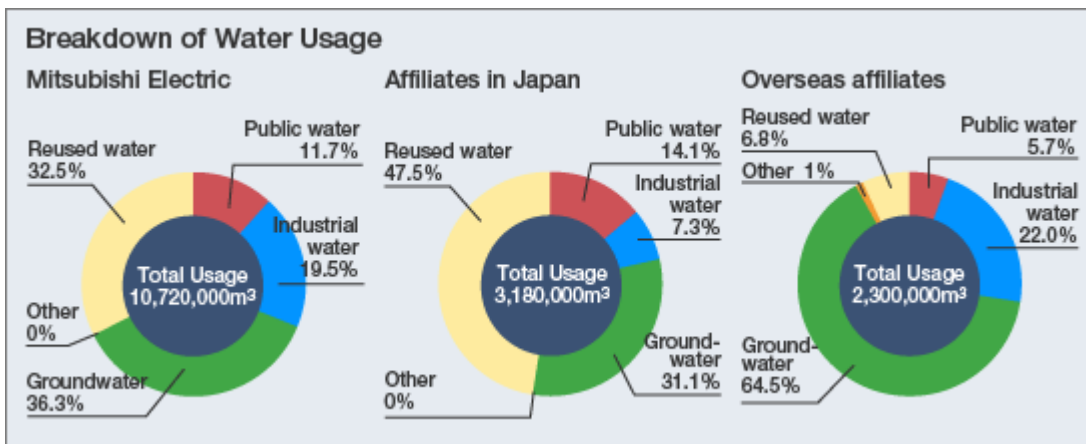
Environment – Using Water Effectively

Promoting Water Conservation and Water Recycling in Japan and Overseas

The Mitsubishi Electric Group views public water, industrial water, groundwater and other sources of water as a valuable resource. We work to assess our water usage at all sites and to conserve and recycle this resource.

In fiscal 2014, Mitsubishi Electric used a total of 10.72 million m³ of water, a 5.0% increase over the 10.23 million m³ used in fiscal 2013. The total volume of water used at our affiliates in Japan was 3.18 million m³, a 10% decrease compared to the 3.52 million m³ used in fiscal 2013. The volume of water used at our overseas affiliates totaled 2.30 million m³, a 6% increase compared to the 2.18 million m³ used in fiscal 2013.

The water recycling ratio was 33.0% for Mitsubishi Electric, 48.0% for affiliates in Japan and 5.7% for overseas affiliates.



Environment – Managing Chemical Substances

Managing 3,181 Controlled Chemical Substances using Our Own Chemical Substance Management System

Mitsubishi Electric and its affiliates in Japan have been managing chemical substances on a voluntary basis since 1997. These include refrigerant fluorocarbons (HFCs*1 and HCFCs*2) used in air conditioners and refrigerators, volatile organic compounds (VOCs), and the six RoHS substances. Combined with the 462 substances designated under the PRTR Law*3 (PRTR*4) revised in November 2009, the above comprise a current list of 3,181 substances we voluntarily manage under a comprehensive Chemical Substance Management System that includes purchasing information about materials and components.

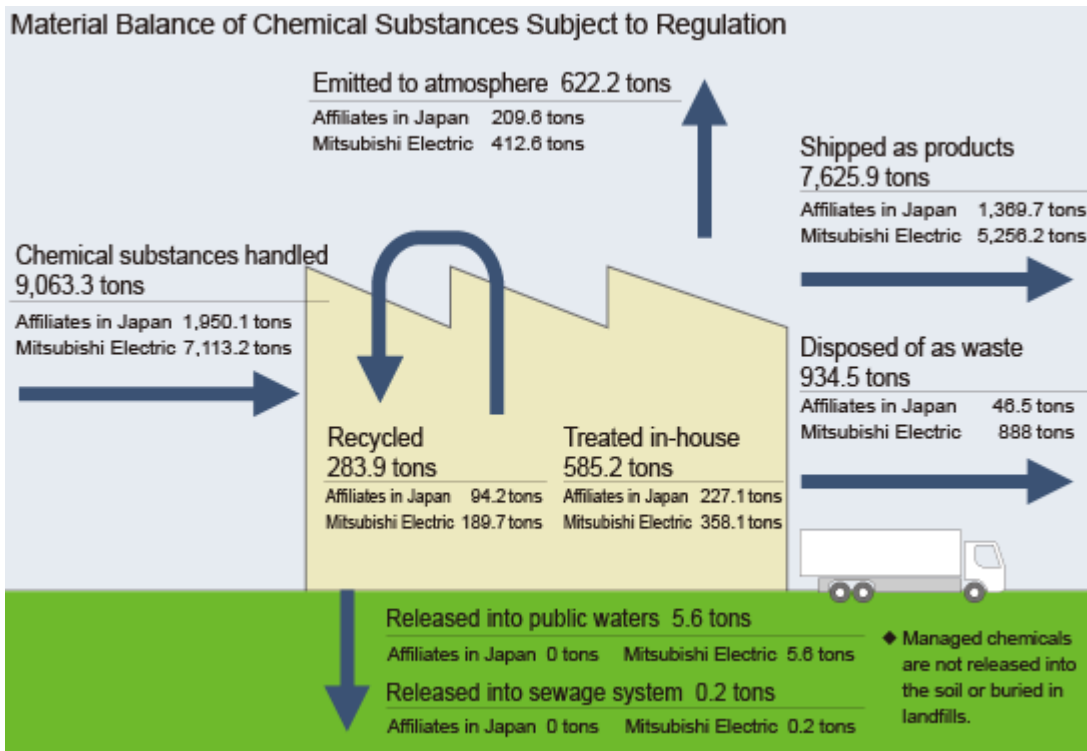
In fiscal 2014, Mitsubishi Electric used 144 different chemicals totaling 7,113.2t (fiscal 2013: 137 substances, 6,785.6t), while affiliates in Japan used 43 substances totaling 1,950t (fiscal 2012: 48 substances, 1,835t). Details of the release and transfer of these substances are shown in the figure below, while the 10 substances with the highest volume of release and transfer by the Mitsubishi Electric Group are outlined in the table below. In the future, we will continue to assess and manage our use of these substances as well as make every effort to eliminate waste.

*1 HFCs: hydrofluorocarbons.

*2 HCFCs: hydrochlorofluorocarbons.

*3 PRTR Law: Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to their Management.

*4 PRTR: Pollutant Release and Transfer Register, a system by which businesses assess and report to authorities the volume of potentially harmful chemical substances released into the environment and the volume transferred within waste. Authorities, in turn, compile and release information on total volumes based upon the reports and other statistics.



Mitsubishi Electric Group Chemical Release/Transfer Ranking (Fiscal 2014)

Mitsubishi Electric (Unit: tons)

Rank	Substance	Amount handled (tons)	Amount released /transferred (tons)	Amount eliminated /recycled (tons)	Amount consumed (tons)
1	Lead	939	64	870	5
2	Bis(4-isocyanatophenyl) methane	628	620	8	0
3	Styrene	283	128	155	0
4	Hydrogen fluoride and other water soluble salts	243	23	0	221
5	Xylene	139	85	6	48
6	Antimony and antimony compounds	129	9	119	1
7	Tetrahydromethylphthalic anhydride	100	5	93	3
8	Toluene	90	58	11	22
9	1,2,4-trimethylbenzene	86	33	4	49
10	Ethylbenzene	41	35	2	4

Affiliates in Japan (Unit: tons)

Rank	Substance	Amount handled (tons)	Amount released /transferred (tons)	Amount eliminated /recycled (tons)	Amount consumed (tons)
1	Styrene	614	7	24	583
2	Nickel	306	0	0	306
3	Toluene	195	138	16	40
4	2-aminoethanol	183	0	183	0
5	Maleic anhydride	99	5	0	84
6	Methyl cyclohexene-dicarboxylic anhydride	97	1	0	96
7	Xylene	83	39	10	33
8	Ethylbenzene	54	39	10	30
9	Cresol	42	1	0	41
10	Phenol	33	1	0	33

Environment – Development of Environmental Technologies

The Mitsubishi Electric Group conducts environmental technology research and development with the aim of providing products and services that will help protect the environment. The results of R&D in fiscal 2014 are as follows.

Smart Technology

Technology Realizing 50% Less Energy Loss for Power Distribution Grids

In February 2014, Mitsubishi Electric announced a technology that reduces the energy lost in power distribution grids. In regards to the task of adjusting the current and voltage required for supplying electricity, by utilizing an originally developed computational software to perform high-speed three-phase analysis and centralized control of power distribution devices in real-time, energy loss was reduced by approximately 50%.

This technology was achieved as a result of Mitsubishi Electric's Smart Grid Demonstration Project.

News Release

February 13, 2014

- ▶ Mitsubishi Electric Develops Energy Loss-reduction Technology for Power Distribution Grids

New Technology Facilitating Introduction of Renewable Energies with Unstable Power Generation Capacity

In February 2014, Mitsubishi Electric announced a battery-control technology that facilitates increasing the use of renewable energies. This technology can be used to estimate changes in output from solar or wind power generation. It can also control the charging and discharging of the battery as is required to maintain a balanced supply and demand. As a result, electricity with a stable frequency can be supplied without affecting the power grid.

News Release

February 13, 2014

- ▶ Mitsubishi Electric Develops Enhanced Battery-control Technology for Expanded Use of Renewable Energy in Power Systems

Launch of HEMS Equipped with Industry-first Functions

In December 2013, we launched the Mitsubishi Electric Home Energy Management System (HEMS). The maximum number of connectable devices is an industry-high 16, and if including accessory devices, it is possible to visualize electricity cost, gas usage and water usage with this single system. In addition, HEMS are equipped with an automatic energy-saving function and a family calendar function, the first functions of their kind in the industry. These functions take into account the target electricity cost and the family's lifestyle to automatically turn the power-saving mode of each device on/off, enabling energy savings without sacrificing comfort.

Next-generation Power Semiconductors

Launch of New Products Based on SiC Module in Various Fields

In May 2013, Mitsubishi Electric launched power semiconductor modules equipped with SBDs* manufactured using silicon carbide (SiC) for application in products such as home appliances, industrial devices and railcars. In December of the same year, we were the first in the world to commercialize a railcar inverter compatible with 1,500VDC lines that uses a newly developed high-capacity all-SiC power module.* Compared to conventional products, SiC power modules realize 55% less power loss, and volume and weight reductions of approximately 65%.

*1 SBDs (Schottky Barrier Diodes): A diode using the property whereby current is only conducted in a fixed direction when certain kinds of semiconductors and metals are joined (Schottky barrier).

*2 All-SiC power module: A power module in which SiC is used for structural parts of the power module including both the transistor and diode.

News Release

May 9, 2013

- ▶ Mitsubishi Electric Launches SiC Power Semiconductor Modules

December 25, 2013

- ▶ Mitsubishi Electric to Launch Railcar Traction Inverter with All-SiC Power Module

Industry's Smallest EV Motor Drive System Realized

In February 2014, Mitsubishi Electric announced it had developed an electric vehicle (EV) motor drive system. This system reduces power loss by utilizing silicon carbide (SiC) in all elements of the inverter's power semiconductor module for motor drives. Installation and integration of the system into the motor enabled the overall system to be reduced to the smallest size in the industry as compared to other products with equivalent output.

News Release

February 13, 2014

- ▶ Mitsubishi Electric Develops EV Motor Drive System with Built-in Silicon Carbide Inverter

Volume Reduced 60% Thanks to Transistor for Satellite Communications Equipment

In February 2014, Mitsubishi Electric launched a Ku-band GaN HEMT MMIC with a built-in linearizer. This product is a high-output, high-frequency transistor for power amplifiers used in Ku-band* satellite communications. It is the first product of its kind in the world to be equipped with a linearizer.* As a result of integrating the transistor, and matching circuit and linearizer for multiple amplification stages in a single GaN chip, functions have been enhanced and volume reduced 60% compared to the conventional product.

*1 Microwave band ranging from 12 - 18GHz.

*2 Element used to correct power amplification signal distortion.

News Release

January 20, 2014

- ▶ Mitsubishi Electric to Launch Ku-band GaN HEMT MMIC with Integrated Linearizer for Satellite Earth Stations

Environmental Products & Services

Use of Highly Functional, Lightweight Materials for Satellites Expanded to Consumer Products

Based on an original technology, Mitsubishi Electric has been successful in significantly reducing the production and processing costs for CFRP* composite materials used in satellites. CFRP composite materials have high strength and light specific weight. As a replacement for steel and aluminum, they realize weight savings of more than 50% and 30%, respectively. The lower costs achieved this time allow these materials to be used in consumer products. Initially, in fiscal 2015, we are planning to apply them to high-speed elevators and industrial fans.

* CFRP: Carbon-fiber-reinforced plastic.

News Release

February 13, 2014

- ▶ Mitsubishi Electric Develops New Manufacturing Technologies for Lightweight, High-strength CFRP Materials

Environment – Environmental Communication

■ Disclosure and Dissemination of Environmental Information

A look at the various communications published in fiscal 2014, including disclosures on the results of our environmental initiatives, promotion of Eco Changes, participation in environmental exhibitions, and environment-related advertisements.

■ Mitsubishi Electric Outdoor Classroom

Here, we introduce fiscal 2014 examples of the Mitsubishi Electric Outdoor Classroom, our own unique program in which employees take the role of teachers educating others on the wonders of nature.

Environment – Disclosure and Dissemination of Environmental Information

Providing Environmental Information Online and through Corporate Publications

Since 1998, Mitsubishi Electric has continuously reported on its environmental objectives and achievements through a combination of detailed data and case studies. Mitsubishi Electric also runs an informative site aimed at elementary school students, through which students can enjoy learning about environmental issues.

Environmental Report Website



▶ Japanese language website



▶ Global website



▶ "Eco-Planet" website for children

Environmental Sustainability Report



Japanese language version



English language version



Chinese language version

"Eco Changes" Statement

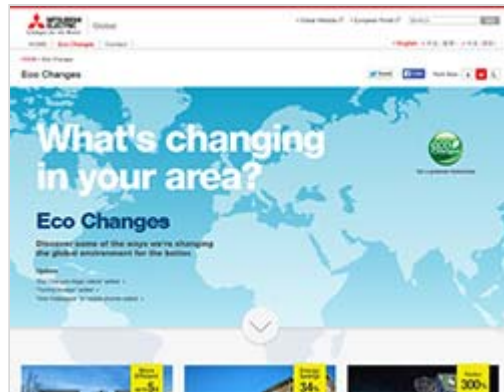
In June 2009, we announced the environmental statement for the Mitsubishi Electric Group in Japan: "Eco Changes – from in the home to outer space." This statement expresses the Group's stance on environmental management. We also launched a dedicated website to introduce a variety of Eco Changes initiatives. The website hosts content from the Eco Changes Lab, by which visitors can learn about Eco Changes through comics and games, making it enjoyable and easy to understand for every age group.

For overseas markets, we established the statement "Eco Changes – for a greener tomorrow" in June 2010 and a separate catch-phrase for China "*jing yu jie neng, jin xin huan bao*," which translates as "experts in energy conservation, dedicated to environmental protection," in April 2012, as part of our broad efforts to roll out environmental communications in areas around the world.

Eco Changes Website



▶ Japanese language website



▶ Global website

Environmental Statement Booklet



Japanese language version



English language version



Chinese language version

Examples of Environmental Communications around the World

Global

A corporate advertising campaign was launched in October 2012 to communicate the advanced environmental technologies and products of Mitsubishi Electric to a global audience. So far, advertisements relating to Eco Changes have primarily focused on our stance as a leading green company. As the next step, the new global corporate advertisements will showcase specific products and technologies, while citing examples and quantitative figures.



Residential heating, ventilating and air conditioning (HVAC) system test facility in Scotland, UK



Introductory video



Footage of Himawari 8 and Himawari 9 (geostationary global environment observation satellites)

China

In April 2012, we launched communications in China under a new environmental statement, "*jing yu jie neng, jin xin huan bao*," which translates as "experts in energy conservation, dedicated to environmental protection." "Going forward, we plan to promote this statement in a variety of communications.



Asia

In Asia, we have developed ads that emphasize our activities to change the environment around the world through our businesses and products.



A TV commercial broadcast throughout Asia



Corporate advertisements in India



Corporate advertisement in Vietnam

Europe

Banner advertisements for Eco Changes were published on BBC.com and FT.com in the UK, Germany, France, Italy, Spain, Portugal, Russia and Turkey.



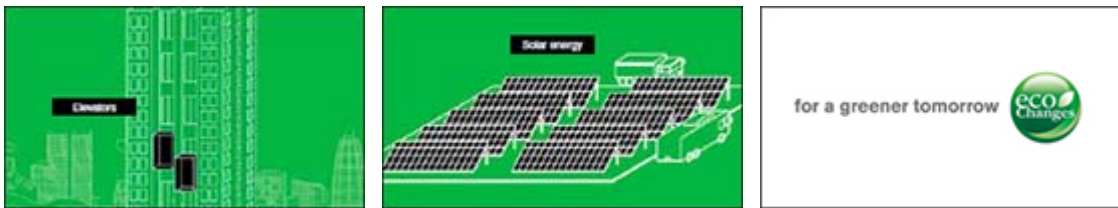
Campaign site from which KIRIE wallpaper can be downloaded



Banner advertisements for the campaign site

United States

We promoted Eco Changes in the United States using magazine advertisements and TV commercials.



Japan

We promote Eco Changes using a variety of media to help raise its visibility. In fiscal 2014, in addition to producing various corporate advertisements, we developed web advertisements in order to encourage more people to visit our Eco Changes website.



Corporate advertisement for newspapers and magazines



Global corporate advertisement (Japanese version)



▶ Eco Changes site

The content of various advertisements can be seen on the Movies & Advertisements section of the Eco Changes site



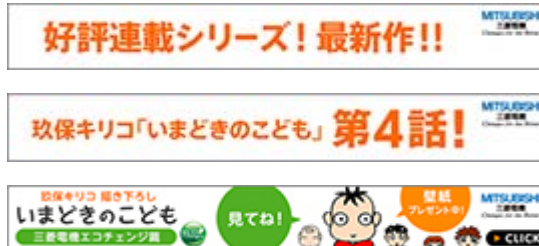
▶ Key Technologies site

This site introduces environmental technologies through easy-to-understand animated videos



Content on the Eco Changes site

▶ Kids of Today: Mitsubishi Electric's Eco Changes



A web advertisement introducing Kids of Today: Mitsubishi Electric's Eco Changes

Environmental Exhibitions

Eco-Products 2013 (Japan)

Mitsubishi Electric participated in Eco-Products 2013, which was held on December 12 - 14, 2013, at Tokyo Big Site. The theme of our exhibit was "Visible Effects Transforming Eco-consciousness – Mitsubishi Electric Eco Changes." In the two zones of "Eco in Outer Space, Society and the Home" and "Building and Factory Energy Savings," we promoted our wide range of advanced environmental products combining displays of models and actual products. Notably, in the Building and Factory Energy Savings Zone, focusing on the examples of the Mita Works and Gunma Works—who were winners of the 2012 Energy Conservation Grand Prize—we introduced the benefits of actually introducing Mitsubishi Electric Group products. In addition to displaying actual products, personnel in charge of energy-saving measures at Gunma Works participated by providing explanations and answering visitors' questions. For the many children that visit the Eco-Products exhibition with their parents every year, we held a workshop called "Let's Make a Telescope!" In the workshop, we briefly explained our space systems business and then children took on the challenge of making a telescope.



Exhibition booth



Eco Changes workbook distributed at the venue



Advertisement at railway station



Advertisement to encourage attendance

Environment – Mitsubishi Electric Outdoor Classroom

The first Outdoor Classroom was held in October 2006 in the vicinity of the Company's head office. Currently, Outdoor Classroom activities are becoming more common throughout Japan, with a total of 203 having been held by the end of fiscal 2014. Here we introduce several unique Outdoor Classrooms held in fiscal 2014.

Real Exploration! "Night Walk" – A Nighttime Visit to the Forest (Kanagawa Branch)

Event date: September 27, 2013

Event venue: Yokohama Nature Observation Forest, Yokohama, Kanagawa Prefecture, Japan

With the cooperation of the Yokohama City Environmental Planning Bureau, we held "Night Walk," a nighttime excursion in which participants experienced nature at night. The venue for the walk was the Yokohama Nature Observation Forest in Sakae Ward, Yokohama. As the event was a nighttime activity different from typical Outdoor Classrooms, it was held under the guidance of rangers affiliated with the Wild Bird Society of Japan.

On the day of the event, the students of Noah International School—a free school in the city—conducted a preliminary inspection of the route, and then the Outdoor Classroom started at 18:30. In the midst of the dark forest, participants discovered evening primrose (*Oenothera biennis*)—a flower that blooms at night to avoid competition from other flowers—nocturnal insects, and more. When a living organism was found, the leader at the time explained points such as how its characteristics differed from those of organisms active during daytime hours, and what it feeds on. The children listened carefully to each point. They became particularly excited when they saw a tree cricket (*Oecanthus longicauda*), an insect that sings at night, and said such things as "It's the first time I've ever seen an insect singing!" while carefully studying it, full of interest.



Surprising encounters with nocturnal wildlife that do not show themselves in the daytime



Creating a friendly atmosphere during preparations

VOICE

An Event that Produced Many Findings Unique to Nighttime Activities

It was the first time for an Outdoor Classroom to be held at night, so for me, it was one surprise after the next.

The first surprise was that once my eyes became accustomed to the dark, to a certain extent I could see my surroundings. Even so, my sense of sight was receiving less stimulation than it would in the daytime, so my other senses became sharper. Along with the children, I was able to experience how it feels to use all five senses differently than I would during the daytime; for example, I was aware of the smells of the forest and the sounds indicating a presence nearby. In addition, we came to an unexpected realization during the course of preparing for the event: in the case of Outdoor Classrooms held at night after regular working hours, an increased number of leaders can participate and it is easier than it usually is to schedule the event.

In the future, with the cooperation of employees, we will be as creative as possible when planning Outdoor Classrooms so that everyone involved will share a sense of joy and wonder.

Hidehiro Hosoi, General Affairs Division, Kanagawa Branch

What Do Insects Do in Winter? Shikoku's First Outdoor Classroom! (Shikoku Branch)

Event date: December 7, 2013

Event venue: Haniwakko Square, Mineyama Park, Takamatsu, Kagawa Prefecture

At the Shikoku Branch, as the venue for our first Outdoor Classroom, we selected Mineyama Park, which is reasonably close to the city of Takamatsu. With the cooperation of the Kagawa University Museum, we set off on an insect hunt with sieves and trays in hand.

When the day of the event arrived, before setting out we researched the proper methods for collecting ants and other insects, as well as precautions in the case of encountering dangerous wildlife. As we departed, even the leaders expressed doubt about whether we would see any wildlife given the winter season. But as we overturned rocks and looked into decaying logs, we found ants—big and small—ant nests, long-horned beetles, woodlice and other small insects. The children quickly learned the trick to collecting the insects and even found and caught millipedes and worms that were discovered in clumps of soil. Then, together with the staff, the children discussed and identified the different insect types.



First, how to look for insects – Is there anything here?



Even in the cold of winter, lively insects... The children look lively too!

VOICE

Improving the Classrooms Little by Little

The Outdoor Classroom was a challenge to execute, but I think it was a big success. The children were quite hesitant at first, but once they discovered organisms carrying out different activities, they started interacting with the environment using their hands. I could see their surprised expressions every time they encountered something different. I, too, was surprised that we were able to provide such a great experience in an urban park.

At the end of the day, everyone involved was relieved that no one had been injured, and I could sense everyone's enthusiasm as we discussed what could be done for the next class. We will continue to hold the event with the support of key people in the community, and work to improve the quality of the Outdoor Classroom, while we better ourselves, too.

Kouji Yonemoto, General Affairs Division, Shikoku Branch

Environment: Training of Environmental Personnel

Environment – The Environment and Business

As a global, leading green company that contributes to creating a more affluent society, Mitsubishi Electric works together with members of the Mitsubishi Electric Group to develop products and technologies that are helping to realize a low-carbon, recycling-based society. These efforts can be witnessed in all areas of business and are an important factor in supporting the Group's growth strategy.

Here, we provide an outline of each business group and their priority environmental issues, and introduce the measures and initiatives implemented to reduce environmental impact.

Public Utility Systems Group



Energy & Industrial Systems Group



Building Systems Group



Electronic Systems Group



Communication Systems Group



Living Environment & Digital Media Equipment Group



Factory Automation Systems Group



Automotive Equipment Group



■ Semiconductor & Device Group



■ Information Systems & Network Service Group



Environment – Public Utility Systems Group

Business Overview and Priority Environmental Issues

Providing a Wide Range of Key Products for Social Infrastructure, Including Water Treatment, Roadway and Rolling Stock Applications

Mitsubishi Electric's Public Utility Systems Group offers an extensive range of products and services used in public utilities and transportation to governments, highway and railway operators, and a host of other companies involved in social infrastructure. These solutions include water treatment plant systems, intelligent transport systems, transportation information systems, and electromagnetic products for rolling stock. Our aim is to manufacture products that are smaller, weigh less, provide better performance and operate with higher efficiency; thereby reducing environmental impact through consuming fewer resources and using less electricity.

In recent years, we have also placed a focus on next-generation infrastructure, and our efforts include introducing solutions to fully optimize the energy used by rolling stock and initiatives for the smart community business. At sites such as the Kobe Works, Itami Works and Nagasaki Works, where operations include designing and manufacturing products and systems, energy consumption has been reduced by introducing improvements in areas like facilities, testing and distribution. Initiatives for preventing soil and water pollution, including carefully managing the toxic substances used in painting facilities, have been implemented as well.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources
- Water/soil pollution due to operations/procurement
- Proper management of chemical substances in design/manufacturing

Message from Public Utility Systems Group

Helping Build Next-Generation Social Infrastructure with a Broad Range of Technologies and Continuous R&D in Order to Realize the Vision of a Low-Carbon Society

Mitsubishi Electric's Public Utility Systems Group provides a host of products that serve a vital, long-term role in social infrastructure, including water treatment facilities, roadways and rolling stock. As part of this, while ensuring high quality and functionality in design/manufacturing, we are continuing to promote a reduction in the use of resources and power through size/weight reductions and higher performance/efficiency as the basis for our aim to realize a low-carbon society.

In recent years, we have seen heightened expectations toward the development of next-generation social infrastructure that makes full use of renewable energies and information and communication technologies (ICT), which supports greater power supply efficiency and optimization. As such, we are working diligently on total energy and environmental solutions for railways. As part of our commitment to the full optimization of energy consumed by railways utilizing ICT, we have developed new energy technologies, and produce and store energy for train energy management systems (TEMS), station energy management systems (SEMS), factory energy management systems (FEMS) and railway energy management systems (REMS). We are also focusing on the potential of smart communities, which will achieve stable supplies of energy using a combination of renewable energy and off-grid power sources.

Going forward, Mitsubishi Electric's Public Utility Systems Group stands firmly committed to making society safer and more convenient for everyone by making full use of our wealth of proprietary technologies and strengths in R&D.



Takahiro Kikuchi
Executive Officer
In Charge of Public Utility
Systems

Initiatives Contributing to the Environment and Society

Total Energy and Environmental Solutions for Railways

As part of our commitment to the total optimization of energy used by railways, we are helping to realize the vision of a low-carbon society.

- **Production of Inverter Incorporating Large-capacity, Full SiC Power Module for Rolling Stock**

One of our production initiatives was manufacturing an inverter equipped with a full SiC power module for use in rolling stock. Compared to the insulated gate bipolar transistor (IGBT) power module used to date, the new module offers an impressive reduction in generation loss and is much smaller and lighter than its predecessor. Plans are to introduce the new product to the market by the end of this fiscal year.

- Power loss reduced approximately 55%, volume/weight reduced approximately 65%
- Energy savings of approximately 30% achieved for overall rolling stock system including electric motors



Inverter with large-capacity, full SiC power module for rolling stock

- **Production of station auxiliary power system**

We have produced and introduced to the market a station auxiliary power system that is capable of supplying the regenerative electric power generated when rolling stock is braking directly to a station's electrical facilities (lights, air conditioners, elevators, etc.).

- **Traction Energy Control System**

We are developing the Traction Energy Control System, which uses ICT to control overhead voltage based on a railcar's operating status. This system streams railcar information in real-time via an information-communication network to a land-based management system that controls substation output, station auxiliary power systems and electricity storage systems. The ultimate goal of the solution is to minimize energy consumption across an entire railway system.

Smaller, Lighter Air-conditioning System for Rolling Stock

We introduced smaller-diameter piping and achieved a 20% reduction in heat exchanger size, thereby enabling the production of a more compact air-conditioning system. Additionally, to help prevent global warming caused by depletion of the ozone layer, our aim is to reduce environmental impact by promoting the use of an alternate refrigerant that has a zero ozone-layer depletion factor.



Air-conditioning system for rolling stock

Lightweight Automatic Platform Gates Realized

The size and thickness of the steel plating used for automatic platform gates were reduced, achieving a lightweight design and modified structure without sacrificing passenger safety. We also made improvements in the control method for cutting electrical current to the motor when the doors are closed (not in operation), reducing standby power by approximately 50%.

Energy Management System Developed

Forecasting power demand based on data such as past usage and weather reports, we developed a function that realizes the optimum supply of energy by combining the following power sources: commercial electricity, photovoltaic power generation, and storage batteries. We plan to introduce practical use of smart energy systems by incorporating this system into building management systems, water treatment plant systems, etc.

Highly Efficient, More Compact Ozone Generator Realized

Our ozone generators are being used in advanced water treatment processes and paper pulp bleaching because of their superior oxidation and ability to eliminate bacteria, odors and colors. The more compact and higher efficiency design was achieved through the use of narrower electrodes and shorter gaps developed for oxygen sources at the air source. This new design results in a 15% cut in system power consumption.



Ozone generator

Production of Energy-saving Road Information Board

We have produced a road information board that utilizes a lens formed to realize higher light focusing performance and packages the luminary elements for three primary colors into a single LED display device, with the aim of simultaneously saving energy and improving resolution. As a result, the LED drive current has been reduced and the power required to achieve the same luminance as the previous information board has been reduced to one-third.

Initiatives for Reducing Environmental Impact

Continuous Improvement Activities

Initiatives to reduce energy consumption and CO₂ emissions by improving facilities, testing and distribution continue on a daily basis at sites such as Kobe Works, Itami Works and Nagasaki Works.

- **Equipment Improvements**

New lines built at the Kobe Works and Itami Works employ LED lighting, higher efficiency air conditioners and photovoltaic systems to achieve greater power savings. We are also making improvements that contribute to increasing facility efficiency, such as utilizing the exhaust from thermal-catalyst boilers as a heat source for drying ovens and generating warm water that is used to wash products.

- **Testing improvements**

When testing large electrical equipment such as the VVVF* equipment used in rolling stock, efforts are made to utilize energy effectively, such as using power generated from electrical generators connected as artificial loads that are non-destructive, as well as using night-time power to operate drying ovens.

* VVVF: Variable-voltage, variable frequency control for AC electric motors.

- **Distribution Improvements**

We are promoting the reduction of CO₂ emissions by utilizing returnable packaging and making a modal shift in transportation from using trucks to using railways and ships.

Overseas Production and Maintenance Sites

In response to growing railway demand overseas, in addition to our overseas sites in the North America, Mexico and others, we will start operations in Italy this fiscal year. To prepare for greater demand in Asia while considering global warming in the future, we will reinforce and expand overseas production sites and promote local production for local consumption in order to reduce CO₂ produced during transportation.

Environment – Energy & Industrial Systems Group

Business Overview and Priority Environmental Issues

Delivering Equipment and Systems that Support Stable Electricity Supply

Mitsubishi Electric's Energy & Industrial Systems Group provides a wide range of systems and products that play a vital role in power generation, power conversion, power distribution and power retailing. On the product side, this includes generators, switches, transformers, switchgear and vacuum circuit breakers, while systems include plant monitoring, system stabilization and system preservation and control. With the realization of a low-carbon society now an important theme globally, we are more committed than ever to making contributions to the energy conservation of power companies and end users alike through the development of high-efficiency equipment and by stepping up our involvement in businesses related to smart grids and smart communities.

We manufacture equipment and systems at the Energy Systems Center and Transmission & Distribution Systems Center (both are located in Hyogo Prefecture and engage in small-lot production), as well as at the Power Distribution Systems Center (Kagawa Prefecture; small-lot and mass production) and at our affiliates in Japan and overseas. Our business group focuses on reducing the environmental impact resulting from the operations of our overseas affiliates, reducing the emission of SF₆ gas—which has a high global warming potential—and strengthening the management of chemical substances under the guidance of our domestic site, which is the mother factory.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources
- Proper management of chemical substances in design/manufacturing
- Preservation of biodiversity in areas where we operate

Message from Energy & Industrial Systems Group

Helping Achieve a Low-Carbon Society through Developing High-Efficiency Equipment and Stepping Up Our Involvement in Businesses Related to Smart Grids/Smart Communities

As a provider of a full range of equipment and systems, from power generation to transmission and distribution, we recognize that achieving a low-carbon society represents one of our most important missions. Based on this, the Energy & Industrial Systems Group is now focusing on two initiatives. The first is developing highly efficient equipment and promoting its greater use. Under this initiative, we are developing and commercializing high-efficiency generators, switches for controlling heat generation, transformers that reduce energy loss, and equipment that eliminates or reduces the use of SF₆ gas, which has a high global warming potential, with the ultimate goal of reducing CO₂ emissions from product usage. The second is stepping up our involvement in businesses related to smart grids and smart communities. Utilizing technologies and know-how acquired at our in-house proving and testing facilities, we are expanding the delivery of products like smart meter systems and storage battery systems that contribute to realizing "highly efficient, extremely reliable low-carbon power distribution systems," "systems that optimize energy use by enabling users to visualize and control consumption," and "a robust energy infrastructure that operates seamlessly even at the time of an emergency." We are also working on the development of power generation stabilizing equipment and systems capable of answering new demand. This includes further improving the efficiency of thermal power generation, promoting the expansion of nuclear power generation business based on the energy policies of each country, and handling the nationwide demand and supply of electricity in Japan by connecting electric power utilities companies.



Yasuyuki Ito
Executive Officer
In Charge of Energy &
Industrial Systems

On the other hand, regarding reducing the environmental impact resulting from business activities, our focus is to continuously reduce the energy used in production and testing processes and enforce the strict

Initiatives Contributing to the Environment and Society

Low-loss Turbine Generator

We developed a proprietary low-loss structure using cutting-edge 3D analysis technologies, which has cut energy loss by approximately 20%*. This structure was used to develop and commercialize a highly energy-efficient turbine generator.

* Approximate 20% reduction: Compared to conventional Mitsubishi Electric turbine generator with the same functions.



Low power loss turbine generator

Switches that Reduce Environmental Impact

In fiscal 2013 (ending Mar. 2013), we commercialized a 72/84kV vacuum circuit breaker (VCB) using dry air insulation (completely SF₆ gas-free). We are also moving forward with the development of a series of gas circuit breakers (GCB) that employ a spring structure instead of the conventional hydraulic structure to significantly reduce maintenance work. We completed commercialization work for our range of products up to 500kV in fiscal 2013. We are now working on curbing heat generation and extending the life of this equipment.



Vacuum circuit breaker



Gas circuit breaker

Transformers that Reduce Environmental Impact

We supply customers both in Japan and abroad with a large number of highly efficient transformers that can reduce electricity loss during the transmission and conversion which occurs between the power plant and end user, and that can reduce heat generation, which helps curb CO₂ emissions. We are also developing compact transformers that help reduce materials usage.

Smart Meter Systems and Storage Battery Systems Essential for Realizing Smart Grids and Smart Communities

Regarding business related to smart grids and smart communities and their contribution to climate change measures, we established a proving and testing facility to gather technologies and knowhow assuming the requirements for power transmission and distribution networks in 2020. Utilizing the technologies and knowhow accumulated and customers' evaluations obtained from this approach, we will focus on practical specific business expansion activities.

First, smart meter systems will be the core component for fully liberalizing retail power sales. After 2016, it will be possible to freely select where one purchases electricity, and the information as to when, where and how much was used will be indispensable. Therefore, we are currently focused on developing a system that enables large volumes of meter data to be collected accurately and at low cost.

Second, validation is advancing for our storage battery system as a practical power system for isolated islands. As the power changes in isolated power systems based on whether the power is generated from fossil fuels or renewable energy resources, this system is the key for balancing the overall system. The product has been delivered, is being used in an actual power system, and has been proven operational.

Our current focus is reducing output fluctuation when using renewable power generation sources such as wind and sunlight, a vital issue for stable power systems. We are also working to help introduce more renewable energy systems, contribute to suppressing the amount of power generated using fossil fuels and expand the products that will ensure stability in large power systems in the future.

Development of a Next-generation Monitoring Control System with Minimum Environmental Impact

We have developed a system for monitoring the status and controlling operations at power generation plants. While ensuring compatibility with existing instrumentation and control systems, the new system offers extensively enhanced functionality and improved performance, realizing precise control.

By consolidating functions, reducing the number of parts, reviewing the power source system and other measures, volume and weight have been reduced up to 30% compared to the previous model, realizing resource and space savings. In addition, power consumption has been reduced 30% as well.



Instrumentation Control System

Initiatives for Reducing Environmental Impact

Staying Focused on Preventing Environmental Pollution and Reducing CO₂ during Production

The Energy & Industrial Systems Group's manufacturing bases (4 at Mitsubishi Electric, 14 affiliates in Japan, 3 overseas affiliates) manufacture equipment in small lots, including large generators and transformers. They also produce medium-sized equipment and system devices using small-lot production and manufacture components, assemble products and perform testing for plates, machine work and insulation materials. Each factory pays particularly close attention to prevent air, water or soil pollution, since they handle chemical substances and insulating oil. These factories also use great amounts of energy because of their large furnaces, cleanrooms, hot-water baths and testing facilities. As a result, each is taking steps to reduce CO₂ from production by systematically installing PV systems, electrifying steam-powered equipment and conserving energy by reusing factory exhaust heat as well as by promoting activities that minimize the release of SF₆ gas into the atmosphere.

Raising the Effectiveness of Environmental Activities by Sharing Information Between Factories

The Energy & Industrial Systems Group is working to raise the effectiveness of its environmental activities by having environmental managers from Mitsubishi Electric's works and affiliates attend the environmental promotion conferences and through energy conservation inspections and environmental surveys conducted at affiliates.

Fiscal 2014 Implementation Status

- **Environmental Promotion Conferences**

Sessions: 6 (2 managers' meetings; 4 working-level meetings)

Theme: Activities established for reducing CO₂ emissions during production by improving facility operations and JIT manufacturing processes

Main results: Reduced CO₂ emissions by 2,119t-CO₂/year as a consolidated group, including all affiliate companies, implementing energy-saving measures such as improving operations in production facilities, switching to electricity for steam facilities, reducing loss of steam and improving JIT manufacturing processes.

- **Environmental Audit**

Audits were conducted at Melco Control Products Corporation (Hyogo Prefecture), the Asahi Factory of Ryosan Industry Corporation (Aichi Prefecture) and Uemori Electric Co., Ltd. (Kagawa Prefecture).

- **Environmental Survey**

Surveyed Mitsubishi Electric Switchgear Manufacturing Co., Ltd. in China.

Environment – Building Systems Group

Business Overview and Priority Environmental Issues

Delivering Safe, Secure and Convenient Products and Solutions that Enhance the Value and Functions of Entire Buildings

Mitsubishi Electric's Building Systems Group provides elevators and escalators—as well as building management systems that include access control, building management and surveillance cameras—to public and private building owners in over 90 countries. As key components of the social infrastructure, it is necessary to deliver products that are safe, secure and convenient. To this end, we provide a full range of support that spans from initial sale to maintenance services and upgrades, as well as new solutions that further enhance the value and functions of entire buildings. As part of this, we are aggressively expanding the sales of energy-efficient, compact and lightweight elevators and escalators, as well as building management system products that realize attainable energy savings according to building usage conditions by monitoring and controlling the energy usage conditions of building facilities. Doing this will help to reduce CO₂ emissions throughout society and enable us to contribute to reducing environmental impact.

Additionally, Inazawa Works, which serves as the mother factory to manufacturing companies in 10 countries around the world including Thailand and China, produces, processes, paints and assembles elevator components such as traction machines, appearance parts and control devices. Environmental initiatives, such as reducing CO₂ from production, switching over to lead-free solders and eliminating the use of wood in packaging materials by adopting returnable containers, are being expanded from the Inazawa Works to other manufacturing companies as we promote reducing environmental impact globally.

Priority Environmental Issues

- Climate change
- Waste reduction/management
- Proper management of chemical substances in design/manufacturing

Message from Building Systems Group

Proactively Delivering Energy Conservation and Environmental Solutions through Our Elevators and Facima & DIGUARD Systems

An important mission of the Building Systems Group is to ensure the continued delivery of safe, secure, convenient products around the world. In light of the ever-increasing demand in the elevator/escalator industry, whether it be for new facilities in emerging countries such as China and India or for renewal in developed countries, there is a need to provide safety and security, as well as energy efficiency and space and weight reductions. In response to these societal demands, the Building Systems Group makes proposals that focus on eco-conscious products, such as introducing energy-saving functions in the latest models and reducing power consumption through renewal. Additionally, based on our Facima*¹ and DIGUARD*² systems, which harness the overall strengths of Mitsubishi Electric, we propose new solutions from the perspective of the "entire building", and support the introduction of attainable energy efficiency and conservation that consider user comfort and convenience.

At the same time, we are focusing on reducing environment impact from production processes. Currently, our group is a global supplier of elevators and escalators, with manufacturing companies in 10 countries worldwide. In the future, as local production for local consumption continues to progress and the production ratio of our overseas manufacturing companies increases, the mother factory, Inazawa Works, will expand its environmental initiatives to manufacturing companies in Japan and overseas. These initiatives include reducing CO₂ from production, suppressing the use of harmful metals and chemical substances, and promoting recycling. In doing this, we will work to create production activities that are more environmentally focused.



Nobuyuki Abe
Executive Officer
In Charge of Building
Systems

*1 Facima: Open integrated management system for building facilities.

*2 DIGUARD: Mitsubishi Electric's total security solution.

Initiatives Contributing to the Environment and Society

High-speed Elevators – NEXCUBE (for Japan) and NexWay (for overseas)

Compared to other models, high-speed elevators require a large-capacity traction machine with high power consumption. To counter this, through application of its original stator core technology, Mitsubishi Electric has successively introduced traction machines that are more energy efficient, more compact and lighter than conventional models. For the control devices, we use full silicon carbide (SiC) in the production of our world-pioneering power semiconductor modules which, compared to our conventional product, reduces power loss by 65%, while also reducing volume by 40% as a result of restricting heat discharge. Additionally, owing to the incorporation of an energy-saving elevator group control system that controls the allocation of multiple elevator cars, further energy savings (up to 10%) has been realized.



Full SiC semiconductor module and control device

AXIEZ Series – Standardized Elevators for the Japan Market

AXIEZ Series elevators greatly reduce power consumption and achieve energy savings of up to 20% compared to conventional models. They accomplish this by using a gearless traction machine equipped with a permanent magnet motor, LED ceiling lighting inside the car, reduced standby power when the elevator is not in operation, and having an optimized balance between the car and counterweight. AXIEZ Series elevators can contribute to even further reductions in power consumption through the incorporation of a converter system that stores and uses electricity generated during braking. Furthermore, we have added a large-capacity elevator to the lineup. With a capacity of 17-26 passengers, it is ideal for applications where traffic flow is high such as large office buildings, commercial facilities and hospitals. Compared to conventional models, this model has a more compact traction machine, and elevator car, counterweight and hoistway structural parts are all lighter.



AXIEZ

NEXIEZ Series – Standardized Elevators for International Markets

The NEXIEZ Series, a line of standardized elevators for international markets manufactured in Thailand by Mitsubishi Elevator Asia Co., Ltd., also uses a gearless traction machine equipped with a permanent magnet motor. This results in a more compact, lightweight design and a 20% reduction in power consumption compared to conventional models. NEXIEZ Series elevators can contribute to even further reductions in power consumption as they are equipped with LED interior lighting and a converter system that stores and uses electricity generated during braking. For Central and South America and India, we have introduced new models aligned to local needs and are promoting local production and local procurement as we aim to disseminate our highly energy-efficient products.



NEXIEZ-LITE (elevator for India)

EleFine Service – Offering a Full Lineup of Solutions for Hydraulic Elevator Renewal

The EleFine service introduces renovations to the controls and drives of hydraulic elevators, upgrading them to inverter-equipped, state-of-the-art roped, machine-room-less elevators. Renewal realizes a smoother, more comfortable ride, and can result in reducing power consumption by up to 65%. Additionally, the amount of waste resulting from complete replacement can be reduced by up to 60% thanks to the ability to reuse existing landing areas and cars.

Facima Building Automation System

Facima is a building automation system for monitoring and controlling building facilities such as air conditioning, lighting and access status. The system optimizes demand control by monitoring peak energy demand and stopping the operation of air-conditioning/lighting facilities as required based on a priority order set by the building manager in advance. Facima also automatically controls building facilities according to tenant business hours and holidays, which assists in achieving reductions in power consumption while considering user comfort and convenience. Additionally, Facima collects and analyzes data on the operation of building facilities, visualizes energy use conditions, and proposes energy-saving and cost-reducing options for the entire building.



Facima BA-system touch control panel

Initiatives for Reducing Environmental Impact

Rolling Out Initiatives of Mother Factory at Overseas Manufacturing Companies

The Building Systems Group manufactures elevators and escalators at manufacturing companies in 10 countries worldwide, including Japan, Thailand and China. At the Inazawa Works, the mother factory in Japan, there is a particular aim to improve the energy efficiency of machinery used in processes that consume large amounts of power, such as the production equipment for machining and painting. In the future, as local manufacturing for local consumption increases and the production ratio of our overseas manufacturing companies grows, we will proactively introduce the following initiatives and other measures to overseas manufacturing companies with the aim of reducing environmental impact at the global level.

- **Promoting Production Equipment Energy Savings and Lower VOC Emissions**

A wide range of processes are involved in the production of elevator and escalators. One of the processes requiring high power consumption is machining. However, by updating to the latest processing equipment and shortening the processing time, higher productivity has been achieved and power consumption suppressed.

The use of heating energy is very high in painting processes as well, where heat is utilized both during the preparation process (parts cleaning) and drying process. With this in mind, the temperature and quality of the processing liquid were reviewed and the temperature was lowered, resulting in a reduction in power consumption. We have also installed a volatile organic compound (VOC) removal device in the painting line to reduce VOCs emitted during the drying process. Additionally, we visualize factory air usage (flow meter at factory entrance) as part of our activities to reduce power consumption from compressor usage.

- **Introducing Renewable Energies**

A total of 896 photovoltaic module panels (total output of 201.6kW) were installed on the roofs of buildings at the Inazawa Works, and the electricity generated is used to power facilities and air-conditioning equipment inside the factory. Additionally, for all group company buildings constructed in the future, we will promote the utilization of photovoltaic modules and eco-conscious items (specifications such as LED lighting, water-saving toilets and recycling materials).

- **Upgrading Aging Facilities and Introducing LED Lighting**

We have updated aging boilers, compressors, transformers and air conditioners to more efficient equipment, and are switching to the use of LED lighting when replacing lighting equipment, thereby achieving greater energy savings.

- **Promoting Materials Recycling**

We are collecting and sorting waste plastic for recycling purposes. To further promote this initiative, we began collecting and sorting electronic component reels, plastic bands and plastic containers in April 2011. This has enabled us to recycle one ton of materials every month.

- **Reducing Wooden Packaging Materials and Number of Trucks**

To comply with the increasing demand for zero emissions from construction sites in Japan, we are promoting the use of returnable containers for appearance parts (jamb, elevator car) of not only standard elevators, but also custom-order elevators. In this way, we are aiming to eliminate the use of wooden packaging materials and reduce the number of trucks used.

- **Lead-free Printed Circuit Boards**

We are taking steps to reduce our use of lead in compliance with regulations being enacted around the world, including Europe's RoHS. Today, elevators are not subject to the RoHS directive, but as a

Environment – Electronic Systems Group

Business Overview and Priority Environmental Issues

Safeguarding People's Lives and Contributing to Space Research and Cutting-edge Technologies

Mitsubishi Electric's Electronic Systems Group manufactures communications, broadcast and observation satellites, ground control systems required for satellite operations and large telescopes, like the Subaru Telescope. In this way, we are safeguarding people's lives and contributing to space research and cutting-edge technologies. We also supply electronics equipment such as contact image sensors used in copiers and modules for millimeter-wave radar used in vehicle safety systems to communications companies and automotive manufacturers. At the Kamakura Works and Communication System Center, our main sites in Japan, activities such as reducing CO₂ from production, preserving biodiversity, local cleanup activities and employee visits to local elementary and junior high schools for the purpose of educating children about coursework prior to entering a company and environmental issues are promoted.

Priority Environmental Issues

- Climate change
- Deforestation
- Preservation of biodiversity in areas where we operate

Message from Electronic Systems Group

Working to Solve Environmental Problems and Develop Products for Next-generation Energy Solutions

The products of the Electronic Systems Group play a vital role in solving humankind's shared environmental problems and in the development of next-generation energy solutions. For example, we are the primary contractor for manufacturing the "IBUKI" (GOSAT) launched in 2009 and GOSAT-2 scheduled for launch in 2017, which are designed to observe the concentration distribution of greenhouse gases and monitor the emission and absorption of these gases, thereby assisting in the prevention of global warming. In addition, "Himawari-8" and "Himawari-9", which are geostationary meteorological satellites scheduled for launch in 2014 and 2016, respectively, will provide even greater observation capabilities for monitoring global warming and weather phenomena. We are also conducting research on space-based solar power generation; that is, generating electricity from sunlight in outer space and sending the electricity back to Earth via radio waves for a 24-hour-a-day stable supply of electricity.



Yoshiaki Nakatani
Senior Vice President
In Charge of Electronic
Systems

Meanwhile, one of our ground-based solutions is Doppler Lidar, which can remotely measure the moving speed of dust and particulates in the atmosphere. Doppler Lidar is also able to monitor and forecast substances that have an environmental impact on the basis of automobile emissions or the heat-island effect. Furthermore, there are expectations that, on the basis of optimized control, it will contribute to higher efficiency and a longer service life for wind turbines used in wind power generation, a renewable energy that is expected to be used to a greater extent in the future.

We are also working to reduce CO₂ emissions from the production of these products. Most precision electronic devices are manufactured in cleanrooms and require the use of testing equipment. As such, we have been working to improve the operation of air conditioning and testing equipment so that energy is used more efficiently.

Initiatives Contributing to the Environment and Society

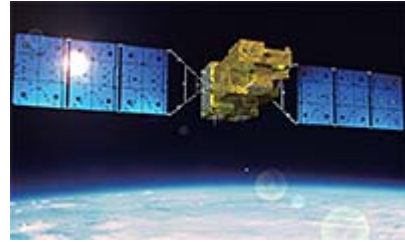
Contributing to World-leading Global Environment Observation

The Japan Aerospace Exploration Agency (JAXA) selected Mitsubishi Electric as the primary contractor for GOSAT-2*1. The satellite is scheduled for launch in 2017 as the successor to the "IBUKI" (GOSAT) (launched in January 2009), which was developed as the world's first satellite dedicated to space observation of the concentration distribution of greenhouse gases.

GOSAT-2 is equipped with high-performance observation sensors that will enable more precise measurements of greenhouse gas concentration distribution. It will also estimate particulate matter (black carbon, PM2.5, etc.), a capability which assists in monitoring atmospheric pollution. This time, just as with "IBUKI", Mitsubishi Electric is in charge of the entire project, including development and production of the satellite system and observation sensors, constructing the ground-based facilities and overseeing satellite control operations after launch.

Moreover, following in the footsteps of "IBUKI", several greenhouse gas observation satellites are planned for launch, such as OCO-2 for the United States and Carbonsat for the European Union. In view of this, GOSAT-2 is expected to be a focus for international coordination and cooperation.

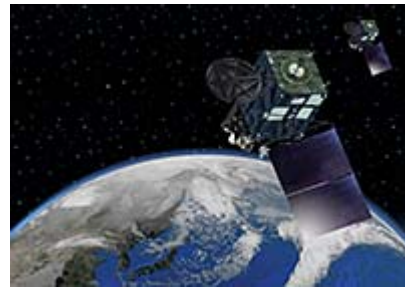
*1 GOSAT-2: Greenhouse gases Observing SATellite-2



Greenhouse gases Observing SATellite-2 (GOSAT-2)

Contributing to Enhanced Monitoring Capabilities of Weather Phenomena and the Global Environment

The weather forecast is a vital part of our daily lives. Following on from "Himawari-7", which continues to operate smoothly, Mitsubishi Electric is now developing "Himawari-8" and "Himawari-9", scheduled for launch in 2014 and 2016, respectively. Equipped with world-leading next-generation meteorological observation sensors, "Himawari-8" and "Himawari-9" will enable an advanced level of monitoring for atmospheric phenomena (typhoons, torrential rain, etc.) and the global environment (sea ice, volcanic ash, yellow sand phenomena, etc.) thanks to enhanced resolution and more observation channels. Additionally, the time required to observe the Earth from space will be significantly shorter than required by their "Himawari-7" counterpart, enabling the latest atmospheric condition to be found out quickly and frequently.



Meteorological satellite "Himawari"

Contributing to Understanding Disaster Situations and Monitoring of Oceans and Forests

Satellite applications such as observation at the time of a disaster, and monitoring the conditions of forests and agriculture are expanding and becoming common around the globe. Mitsubishi Electric's Advanced Land Observing Satellite-2 "DAICHI-2" (ALOS-2) is a global observation satellite launched on May 24, 2014 with the objectives of safeguarding people's lives and solving global-scale environmental problems. As the main contractor for "DAICHI-2", the successor to "DAICHI", Mitsubishi Electric was in charge of manufacturing the satellite, the synthetic aperture radar and ground-based control and processing systems. "DAICHI-2" is expansively carrying on the "DAICHI" mission of map creation, regional observation, understanding disaster status and resource exploration. It is useful for understanding the growth status of grains and other crops, and is supporting the smooth supply of resources and energy, as well as international initiatives to tackle global environmental problems. In addition, "DAICHI-2" can assist in monitoring the illegal logging of forests in tropical rainforest zones such as in Southeast Asia and Brazil.



Advanced Land Observing Satellite-2 "DAICHI-2" (ALOS-2)

Ecological Contributions through Various Uses of Highly Precise Positioning Data

The Quasi-Zenith Satellite System, a system of positioning satellites especially for use by Japan, has an orbit with a large period of time spent near the zenith above Japan. As a result, positioning signals can be sent to spots where positioning was previously difficult, such as places blocked by buildings or mountains. As a supplement to GPS, it has enabled a dramatic improvement in positioning precision: from approximately 10m to the centimeter-level. It is expected that this highly precise positioning data will be used to realize solutions contributing to the environment in diverse fields; for example, eco-drive control and automatic driving using road elevation and positioning data in the automotive sector, more efficient railcar operation and management in the railway sector, and automatic operation of agricultural and construction machinery in the agricultural, construction and civil engineering sectors.



First Quasi-Zenith Satellite "MICHIBIKI"

Doppler Lidar Systems for Wind Assessments at Wind Farms

The purpose of Doppler Lidar (Light Detection and Ranging) systems is to measure wind velocity and direction while detecting aerosols and their movement in the atmosphere. Doppler Lidar helps make wind assessment easier, compared with conventional anemometers, as it can provide real time wind data for wide areas utilizing beam scanning patterns.

One type of Doppler Lidar for windmills is installed on the nacelle of the wind turbine and measures wind velocity and direction in five to nine directions. Its purpose is to measure wind velocity and direction along the line of sight at a horizontal distance of 40 to 250 meters or more*2. Measurement data is sent to the turbine in real time, enabling turbine control that optimizes power generation efficiency, protects the wind turbine and reduces maintenance cost*3.

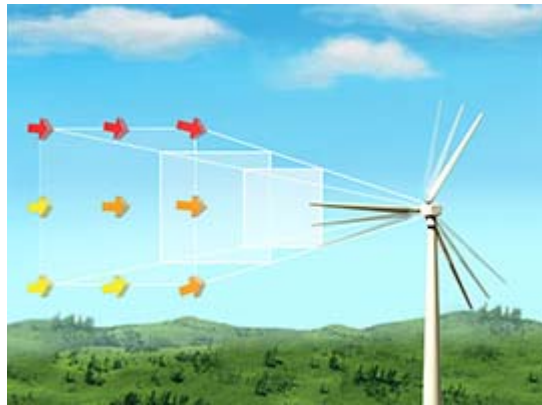
It's also possible to install Doppler Lidars on offshore buoys or platforms, or existing windmills, and they can be used to monitor and extract observation data from a remote location using wireless monitoring and control functions. Eye-safe wavelength (near-infrared, invisible) Class 1M lasers are used to ensure eye safety.

*2 Observation distance varies depending on atmospheric conditions.

*3 Wind turbine power curve can be measured.



Doppler Lidar for windmills



Initiatives for Reducing Environmental Impact

Reducing CO2 Emissions from Cleanroom Production

Precision electronic devices are mainly manufactured, assembled and tested in cleanrooms to maintain quality. In addition, because of the variety of test equipment used, we are striving to reduce CO2 emissions from production by improving productivity and reducing the use of electricity. To achieve this, we adjust the air conditioning of the cleanroom based on whether or not testing equipment is being used. We also analyze the heat in computer server rooms so that hotspots can be eliminated, separate the cold- and hot-air duct work for air conditioners and servers, and optimize air conditioner control.

New Production Building at Kamakura Works – CO2 Emissions Cut by Approx. 23%

The satellite production building completed at the Kamakura Works in March 2013 to augment production implemented the following measures and achieved a 23% reduction in CO2 from production compared to conventional methods.

- **Energy Consumption Control**

We employed LED lighting (approx. 900 bulbs), installed heat-pump air conditioning systems (lower consumption compared to conventional electric heaters), and used a central heat source system*4 to control the electricity usage of air conditioning systems.

- **Building Design**

We adopted a design that uses natural light for the stairwell, break room and mechanical room to reduce electricity usage, enabling use even during power outages, and that mitigates the impact of cooling and heating with Low-E glass*5.

- **Power Generation and Monitoring**

The building features a rooftop photovoltaic system (66kW) and electrical equipment monitoring system. This enables the remote and automated control of general air conditioning for office space, meeting rooms and anterior rooms, including the temperature setting and on/off times.

*4 Central heat source system: A system that consolidates the air conditioning heat source (cold water/hot water) required for multiple cleanrooms in a single location. After hot and cold water transported to each mechanical room is passed through a coil and converted to hot or cold air, the temperature is adjusted using a blower and fed to the cleanroom. The heat-pump chiller, which creates a hot or cold heat source, consists of several units that are automatically controlled to achieve the most efficient operations at the necessary output, thereby achieving energy-efficient operations. System redundancy also ensures that air conditioning will be continually provided to cleanrooms, even if there is an equipment failure.

*5 Low-E (Low Emissivity) glass: A sheet of glass whose surface is coated in a special metallic membrane that consists of tin oxide or silver. This Low-E membrane raises the reflection rate of far-infrared rays. Multi-pane Low-E glass reduces heat transfer, achieving greater insulating performance.

Environment – Communication Systems Group

Business Overview and Priority Environmental Issues

Providing Communications Equipment and Services Contributing to the Advancement of Today's Information Society

Mitsubishi Electric's Communication Systems Group is making contributions to the advancement of today's information society through products and services supplied to communications carriers, financial services firms, retail companies and governments, both in Japan and abroad. These products and services include communications infrastructure equipment that uses optical and wireless information communications technologies (ICTs) as well as surveillance cameras utilizing the latest in video surveillance technologies. ICTs have advanced at a rapid pace and demand has changed almost overnight. Therefore, in order to deliver satisfaction to our customers around the world, we have built an efficient yet flexible production system and cutting-edge development facilities at the Koriyama Plant in Fukushima Prefecture and the Communication Network Center in Amagasaki, Hyogo Prefecture.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources

Message from Communication Systems Group

Contributing to the Development of Communications Markets and Reducing Environmental Impact through Our Value-Added Systems

Networks that incorporate optical and wireless ICTs are key elements of the social infrastructure that make progress in our daily lives and industry possible. Moreover, as ICT devices become more functional and used by larger and larger numbers of people, electricity consumption will also increase rapidly. As a result, the Communication Systems Group is striving to achieve greater energy savings and reduce environmental impact with a focus on three core themes. The first is "energy-efficient products." Here, we are working on energy-efficient designs for optical access systems used in communications infrastructure equipment and communications gateways for service providers. The second is "achieving energy savings in services provided using our products." Here, our optical access systems are used in automated meter readers for smart grids, while our communications gateway equipment is starting to be used in HEMS/BEMS to help make it easier to monitor electricity use. We are also working to market our network equipment for M2M services and for obtaining data for demand response programs. The third is "environmental contributions during installation work." Here, we are developing digital surveillance cameras that reduce and reuse communications cables.



Yasuyuki Nakanishi
Senior Vice President
In Charge of
Communication Systems

We are moving forward with a reduction of CO₂ from production, and at our Koriyama Plant, which was damaged in the Great East Japan Earthquake, we rebuilt the manufacturing building as an "eco factory" and reduced CO₂ emissions from the production of our main products by 25% compared to conventional methods. Going forward, we will further refine our optical and wireless information communication technologies and video surveillance technologies as well as deliver value-added systems to our customers. This will enable us to help develop communications markets around the world and mitigate environmental impact.

More Energy-Efficient and Compact Optical Access Systems

The GE-PON ONU customer network terminating unit for optical access systems uses a passive optical network (PON) to provide up to 64 users with a single optical fiber connection, which makes the unit more compact and energy-efficient. In addition, this unit achieves a 65% reduction in power consumption and 74% reduction in material usage compared to conventional units because of its use of low power consumption parts and reduced number of parts.



GE-PON ONU customer network terminating unit

Equipment for Demand Response* Services

We supply gateway equipment to service providers that connects various household, factory or building networks to an energy management system using a cloud. This equipment is used to obtain power consumption data from home appliances, air conditioning units or production lines, which is then used to deliver demand response services that strike a balance between electricity supply-demand and energy management systems, such as HEMS.

* Demand response: When tight supply-demand conditions are present, the user curbs power use or shifts it to another time at the request of the supplier to maintain an appropriate supply-demand balance.



Gateway

Reducing and Reusing Communications Cables

We are working to reduce and reuse communications cables during installation work through the development of the MELOOK μ + digital surveillance camera system that can use existing analog surveillance camera cables for high-definition and highly functional digital surveillance without laying new LAN cables for digital CCTV.

Initiatives for Reducing Environmental Impact

Environmental Assessment Evaluations

We require environmental assessments for all new product development projects. These assessments are helping us to make products and packaging more compact and to reduce the amount of packaging materials we use.

Koriyama Plant – Reduced CO₂ Emissions from Production by 25%

At our Koriyama Plant, which was damaged in the Great East Japan Earthquake, we rebuilt the manufacturing building as an "eco factory" and reduced CO₂ emissions from the production of our main products by 25% compared to conventional methods. This was achieved by improving productivity and installing the following energy-saving utilities.

- **Overview of New Manufacturing Building (Energy-Efficient Utilities)**

1. Photovoltaic system (1,800 PV panels with a total output of 400kW and annual generating capacity of 350,000kW)
2. LED lighting: 1,100 bulbs (use of motion sensors and dimmers to provide optimal light conditions)
3. Other: Use of top-in-class transformer, central air conditioning control and eco monitors, etc.

- **Productivity Improvement Activities**

1. Expanded production capacity and reduced production space based on just-in-time activities
2. Improved work processes using an analysis from our proprietary surveillance camera (MELOOK μ II)

Koriyama Plant – Reduced Use of Organic Solvents

Koriyama Plant, which engages in every step of the manufacturing process, from materials processing, such as plate fabrication and molding, to product assembly, has reduced its use of organic solvents through use of a microbubble wash during the plate cleaning process and changing to powder paint solvents.

Communication Network Center – Achieved Greater Energy Efficiency through Production Line Improvements

The Communication Network Center, which designs and assembles nearly all of the products made by the Communication Systems Group, made improvements to its production line to more flexibly respond to changing demand from the marketplace, resulting in less space being used and improved productivity. As a result, the Center was able to significantly reduce the amount of electricity it uses for lighting and air conditioning equipment necessary for production. In addition, the Center is working to make the utilities used by its design and sales offices even more energy-efficient by upgrading to higher efficiency air conditioning and making operational improvements.

Affiliates – Contributing to Greater Electricity Savings and Resource Recycling

Communication Systems Group affiliates mainly sell mobile phones. These companies strive to reduce the electricity usage of lighting, air conditioning and office automation equipment at their nationwide outlets as well as collect unwanted mobile phone handsets as part of their recycling programs.

Environment – Living Environment & Digital Media Equipment Group

Business Overview and Priority Environmental Issues

Providing a Broad Range of Products and Services with a Focus on Smart Quality

Mitsubishi Electric's Living Environment & Digital Media Equipment Group manufactures air conditioners, ventilating units, water heaters, photovoltaic systems, lighting solutions, kitchen appliances, home electronics and video imaging equipment. With five sites in Japan, affiliates in Japan and mass-production and assembly factories located in China, Southeast Asia, Europe and Central America, our aim is to expand products globally. We are promoting energy savings by introducing the Company's energy-efficient products and improving productivity at the abovementioned factories. At the same time, we are strengthening the management of chemical substances throughout the supply chain and working to ensure the proper management of waste, exhaust and wastewater.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources
- Proper management of chemical substances in design/manufacturing
- Air/water/soil pollution due to operations/procurement

Message from Living Environment & Digital Media Equipment Group

Developing Eco-friendly Products and Reducing Our Own Environmental Impact

The Living Environment & Digital Media Equipment Group recognizes that contributing to reducing environmental impact by promoting the recycling and energy-efficient use of its products by customers will help to enhance the competitiveness of its business as well.

As part of this, we announced the new concept of "Smart Quality" in fiscal 2013, and we are supplying a broad range of eco-friendly products and services for the home, office and industry. These include energy-saving products that reduce CO₂ from usage as well as photovoltaic systems that generate renewable energy and do not produce CO₂ during power generation.

We are also focusing on reducing CO₂ emissions from production and more effectively utilizing resources, which are both key themes under Mitsubishi Electric's Environmental Vision 2021. As activities to reduce CO₂ from production, we have proactively introduced our core energy-saving products—namely, air conditioners, LED lighting fixtures, heat-pump hot-water supply systems and photovoltaic systems—at all production sites. We are also promoting energy-saving activities by improving productivity linked to just-in-time improvement activities. As for our efforts to more effectively utilize resources, we were among the first manufacturers in the industry to set up a recycling plant to recover and recycle used products in order to establish a sustainable recycling program.



Takeshi Sugiyama
Executive Officer
In Charge of Living
Environment & Digital
Media Equipment

Kirigamine Z Series Room Air Conditioner Sets New Record for Winning Two Awards

Our Kirigamine Z Series air conditioners realize energy savings and comfort based on features such as the i-see Sensor and a newly developed inverter. Recognized for its energy-saving performance, this model was presented the Grand Prize for Energy-Saving Product in the 10th Eco-Products Awards and the ECCJ*1 Chairman's Prize in the 2013 Energy Conservation Grand Prize, the first time*2 for a room air conditioner to win both prizes.



Kirigamine Z Series

*1 ECCJ: The Energy Conservation Center, Japan

*2 As of January 22, 2014, based on in-house review of room air conditioners for residential use.

Package Air Conditioners for Retail Stores and Offices that Help to Conserve Electricity

Introduced to the market in May 2014, our Slim ZR Series package air conditioners for retail stores and office spaces have achieved the industry's top APF*3 rating in all capacity ranges as the result of incorporating a highly efficient heat exchanger and other measures.

*3 Annual Performance Factor: An indicator introduced in 2007 that enables the evaluation of energy efficiency approximately equal to that under actual usage conditions.



Package air conditioners for retail stores and offices

Launch of "Grand Multi" Building Air Conditioning System Realizes Energy Efficiency Capable of Leading the Era of Energy Conservation

The Grand Multi is equipped with the world's first*4 flat-tube heat exchanger, optimized refrigerant distribution and a high-efficiency compressor. As a result, it has earned the achievement of receiving the industry's No.1 APF*5. Additionally, all models comply with low energy consumption laws, helping to realize a building air conditioner that will lead the energy conservation era.

*4, *5 As of October 2013 based on an in-house review of building multi-split air conditioners.



Grand Multi

MILIE – Low Power Consumption LED Lighting

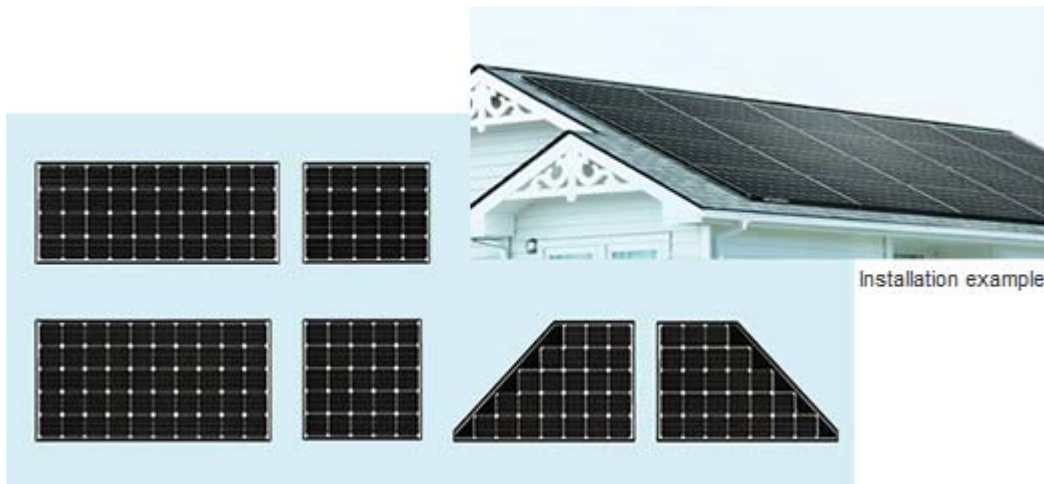
In October 2012, we launched a new LED lighting brand called MILIE, which was coined from the words Mitsubishi, Lighting and Ecology, expressing our desire to make positive contributions to the Earth and its people through LED lighting. MILIE has been supplied to a variety of businesses, factories, retail stores and other facilities including Tokyo Station and Shibuya Hikarie.



MILIE LED lighting

PV Module with Industry-leading Generating Capacity over Its Service Life

We offer an extensive lineup of slim PV cell modules available in various shapes, and that leverage durability and performance, thereby realizing industry-leading generating capacity over their service life. The Multi Roof Series, which uses lead-free, single-crystal PV modules and can be installed on a broader range of roofs, represents the newest addition to the lineup. Module performance also leads the industry in conversion efficiency.



225W Multi Roof Series PV module

Expanding Use of Large, High-purity Recycled Plastics to Home Electronics

Group companies Hyper Cycle Systems Corporation and Green Cycle Systems Corporation are using our originally developed large-scale, high-purity plastic recycling system to reuse recovered plastics in our refrigerators, air conditioners and other home electronics. Additionally, together with Shimadzu Corporation, in February 2013 we developed a high-purity plastics recycling technology that can instantaneously identify plastic with a purity of greater than 99% when sorting and recovering plastics from used home electronics. Our group is using this technology to make advancements in the recycling business, including the automation of purity screening and sorting processes.

Initiatives for Reducing Environmental Impact

High-Efficiency Air Conditioners, LED Lighting and PV Power Generation Systems Being Used at Each Manufacturing Site and Affiliate

All of our manufacturing sites and affiliates utilize the Company's core energy-saving products—namely, high-efficiency air conditioners, LED lighting and heat-pump hot-water supply systems—to reduce CO₂ emissions from production. We have also installed photovoltaic systems that are contributing to the reduction of peak electricity demand during the summer.

Promoting Energy-saving Activities by Improving Productivity Linked to Just-in-time Activities

We are promoting energy-saving activities by introducing improvements that result in higher productivity. This includes reviewing equipment operating loss and reducing in-process defect rates using factory floor just-in-time activities on a company-wide scale. For example, at the Gunma Works, we introduced our Facima^{*6} and SA1-III^{*7} energy management tools that help to visualize energy usage. We are also making efforts to reduce fixed energy consumption at night and during non-working days, as well as reduce energy use at workplaces with characteristically high energy consumption. Of our existing factories, the Gunma Works has become a model factory for reducing CO₂ from production.

^{*6} Facima: An open integrated management system for building facilities.

^{*7} SA1-III: A monitoring and control system for factory facilities, from business offices to production lines and ancillary equipment.

Strengthening the Management of Chemical Substances Affecting the Environment and Human Health

There is an ever-present requirement to minimize risk to the environment and human health, as exemplified by the EU RoHS directive that specifically calls for eliminating the use of six harmful substances and the REACH regulation requiring that information on chemical substance content be provided. In light of this, we are committed to strengthening the management of chemical substances throughout the supply chain in product procurement, design, production, sales and services.

Environment – Factory Automation Systems Group

Business Overview and Priority Environmental Issues

Helping Customers in the Manufacturing Industry to Enhance Their Competitiveness

Mitsubishi Electric's Factory Automation Systems Group provides a wide range of products and solutions in the field of industrial mechatronics, including controllers, drive products, products supporting energy efficiency, and power distribution and control products for automotive manufacturers, equipment manufacturers and other customers in the manufacturing industry. In recent years, there is a growing need to reduce energy consumption and increase automation at our customers' production sites. However, there is also a growing demand for inexpensive products, especially in emerging countries—leading to the situation of market polarization. As a response to this issue, our group is proposing automation solutions that utilize robots and accelerate expansion of the sensor business, while also promoting an expanded range of low-priced products and strengthening the global business system. Each of our production sites is a mass-production facility with automated lines powered by industrial robots. In addition to striving to enhance productivity, we are incorporating proprietary energy-saving equipment, systems and solutions and accumulating expertise and experience through new technological developments. In Japan, the Nagoya Works, Fukuyama Works and Himeji Works are manufacturing and design sites. Overseas, we have sales and service sites, and in some cases production sites, in China, Southeast Asia, India, the United States, Europe and South America. Through productivity and product quality improvements, we are helping to add value to the businesses of our customers around the world and enhance their competitiveness. In addition, as part of strengthening the global business system, we are expanding procurement and production overseas mainly in emerging countries. We are also engaged in efforts to strengthen environmental risk management such as the management of chemical substances in activities like parts procurement and wastewater discharge/atmospheric emissions from factories.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources
- Proper management of chemical substances in design/manufacturing
- Air/water/soil pollution due to operations/procurement

Message from Factory Automation Systems Group

Delivering Devices, Equipment and Solutions that Help Reduce Energy Usage during Production to Customers Around the World

Devices and equipment used in industrial mechatronics are essential to adding value and enhancing the competitiveness of a business through quality and productivity improvements for customers in the manufacturing industry. In recent years, more and more companies want to reduce their environmental impact across the entire supply chain as well as reduce the total cost of ownership (TCO) through energy savings. As a result, demand is growing for solutions that reduce energy usage from production.

Given this, the Factory Automation Systems Group leverages its control and network technologies from factory automation equipment and measurement technologies from its energy-saving activities in the field of power distribution to deliver the energy solution, “e&eco-F@ctory,” which improves productivity and reduces energy costs associated with factory production equipment, which consumes large amounts of energy. We also utilize this solution in-house as part of our efforts to reduce CO2 emissions from production.

Furthermore, we are helping to prevent global warming through the launch of transformers compliant with the Japanese “Top Runner” standards (2nd version), which are highly energy efficient even when used alone, and a high-performance energy-saving motor that is also compliant with Top Runner standards (equivalent to the IE3 efficiency rating). Japanese equipment manufacturers are expanding exports following the weakening of the yen against major currencies, and demand is growing for energy-efficient solutions in emerging countries where infrastructure development



Hideyuki Okubo
Representative Executive
Officer
Senior Vice President
In Charge of Factory
Automation Systems

is moving forward. As such, the Factory Automation Systems Group is working to enhance its product development capabilities as well as establish a position as the top global provider of factory automation solutions by promoting productivity and energy-saving solutions around the world.

Initiatives Contributing to the Environment and Society

Energy Solution "e&eco-F@ctory®"

The energy solution "e&eco-F@ctory®" combines and provides our control and network technologies from factory automation equipment and measurement technologies from our energy-saving activities in the field of power distribution. By visualizing energy consumption per unit of production (i.e., specific energy consumption), this solution contributes to improving productivity and reducing energy costs associated with factory production equipment that consume large amounts of energy.



MELSEC iQ-R Series

Development of Products Compliant with Top Runner Standards

We launched a transformer compliant with the second version of Top Runner standards for fiscal 2015 (ending Mar. 2015) and a high-performance, energy-saving motor compliant with Top Runner standards (equivalent to the efficiency class of IE3*) for fiscal 2016. If all of the approximately 100 million standard motors in Japan were replaced with highly efficient IE3-compliant motors, calculations show that some 15.5 billion kWh of power usage could be reduced annually. The same holds true for other countries as well, indicating the important role that IE3-compliant industrial motors will play in improving natural environments in Japan and abroad.



Superline Premium Series SF-PR Energy- saving Motor

* IE3: Premium efficiency class under IEC60034-30, which classifies single-speed, three-phase, cage-induction motors into energy-efficiency classes.

Laser Processing Machine with Eco Mode

We added an "eco mode" to our eX Series of highly productive three-axis orthogonal CO₂ laser processing machines in order to reduce purge gas and electricity usage when not in use. This mode automatically stops processing machine and oscillator idling, which cuts power consumption by 34%, optical path purge gas by 38%, and processing gas by 63% compared to our existing models. These laser processing machines are helping to reduce the environmental impact from the sheet metal processing used for vehicles, construction equipment, farm equipment, railcars and home appliances.



Laser processing machine

iQ Platform* Compliant C Language Controller Q24DHCCPU-V

By changing the environment of microcomputers and computers used at our factories to the C language controller, we have been able to reduce the size of equipment. The higher level of reliability achieved means that factory lines are stopped less frequently, reducing the consumption of excess electricity. In addition, the C language controller uses less energy when compared to linking information systems with a computer. Furthermore, it is maintenance-free since there is no fan, making it energy-efficient and resource-conscious.

* iQ Platform: Next-generation integrated platform. The iQ name derives from the characteristics of "integrated Q," "improved quality," "intelligent & quick" and "innovation & quest."



C language controller

RV-F Series Intelligent Assembly Robot

To resolve issues such as the need for efficient supply of parts, shorter startup time and the flexibility to cope with parts variations, we have developed intelligent technologies using force sensors, three-dimensional vision sensors, multifunctional hands and more. These intelligent technologies are used in our thermal relay assembly cells. Compared to conventional cell design, the surface area is smaller, and cost and startup time are both reduced approximately 30%, realizing increased production capacity.



RV-F Series intelligent assembly robot

Initiatives for Reducing Environmental Impact

Utilizing Energy Solution "e&eco-F@ctory®"

We reduce CO₂ emissions from production through energy cost reductions and onsite productivity improvements achieved with the energy solution, "e&eco-F@ctory®".

Making Products More Compact and Lighter using Less Materials

We are making numerical control (NC) equipment more compact and lightweight through the use of silicon carbide (SiC) devices. This has helped us reduce materials usage by an average of 39% compared to fiscal 2001 levels. In addition, we are also taking steps to curb our use of natural resources, including reducing rare earth elements used in servo motors and copper used in motor coil wires.

Switching to Higher Efficiency Equipment

We are in the process of systematically replacing aging utility equipment with more efficient models.

Achieved Zero Emissions

We have achieved zero emissions at each of our works.

Reducing CO₂ from Production - Fukuyama Works Smart Meter Production Building

The Fukuyama Works Smart Meter Production Building is in charge of producing smart meters, which are essential to building next-generation energy networks. This facility has implemented the following measures in order to reduce CO₂ emissions from production.

- Reduced heat transfer by 84% for the rooftop and 42% for the wall through full insulation measures and adopting a window-less structure for the production area
- Achieved greater energy efficiency by preventing excessive heating and cooling onsite by centrally managing a City Multi air conditioner system with Move-Eye using the G-150AD Web-based central controller
- Raised the efficiency of air conditioner operations by using an energy-efficient, compact air-cooled heat pump chiller
- Achieved significant energy savings by installing LED lighting (650 straight tubes and 24 ceiling lights) on the building's interior and roof overhangs (reduced energy consumption by 28,400kWh/year and reduced replacement costs by 370,000 yen/year)

Reducing CO₂ from Production - FA Equipment Production Facility at Nagoya Works

The main production building incorporating the latest equipment was completed in 2013. We are constantly pursuing cutting-edge advancements in energy savings. The following lists the effects compared to the energy-efficient devices adopted in 2008.

- Improved insulating properties of exterior walls; adopted Low-E double-pane glass (low emissivity with thermal-barrier high heat insulation)
- Introduced Mitsubishi Electric's latest air-conditioning system, the compact cube e Series (reduced power consumption by 1,0151,200kWh/year)
- Adopted LED lighting systems with motion sensors (reduced power consumption by 24,700kWh/year)
- Introduced energy management system that measures and controls power consumption for air conditioners, lighting and exhaust utilizing the e&eco-F@ctory® energy solution.

Promoting Activities Customized for Each Production Line

In addition to the previous measures, the Nagoya Works and Fukuyama Works are promoting activities customized for each production line to reduce the energy consumption rate from manufacturing. These production lines include those for controllers and other products assembled using mass production, and mechatronics products assembled as single units.

- **Fukuyama Works**
The Fukuyama Works has an integrated production system that spans from parts processing to sub-assembly and final assembly. Automation is advanced as exemplified by the use of 96 multi-joint robots for assembly work. The facility uses "e&eco-F@ctory®" to measure and analyze the energy consumption of each piece of equipment on the final assembly line, which has allowed it to identify waste and take appropriate measures.
- **Nagoya Works**
The mass production line of the Nagoya Works' is achieving greater energy efficiency by improving its tact time through the optimization of shrinkage fitting processes (shortened heating time), including jig and tool modifications. At the same time, the small-lot production line is working to optimize operating conditions by linking production information with equipment (electrical, heat, air and water), which includes improvements in cleanroom air conditioning for cell production (centralized fan control to air conditioning control of production lines). It is also achieving efficiency using the unique characteristics of the line.

Strengthening Chemical Substance Management and Environmental Risk Measures

In addition to expanding design and parts procurement overseas with a main focus on emerging countries, we are promoting local production for local consumption. We are also strengthening measures for chemical substance management in parts procurement and reducing environmental risk at overseas factories.

- **Chemical substance management in parts procurement**

We obtain a written guarantee that harmful chemical substances have not been used, and consider whether or not an analysis should be conducted to determine if parts contain harmful substances when deemed necessary.

- **Environmental risk management of overseas factories**

Based on the laws and regulations of each country/region, we regularly report on the management status of wastewater, atmospheric emissions and harmful substances to related industrial complexes and public organizations, thereby aiming to reduce environmental risk.

Environment – Automotive Equipment Group

Business Overview and Priority Environmental Issues

Strengthening Our Global Development, Production and Sales Systems

Mitsubishi Electric's Automotive Equipment Group delivers electrical components such as alternators, starters and engine control units, as well as car navigation systems and other car multimedia devices to automotive and auto parts manufacturers in Japan and abroad. As a full support supplier, we work together with our customers to develop cutting-edge technologies and endeavor to provide a wide range of services, from production and supply to spare parts and rebuilds. Each of our production sites mass produces parts, while our three development sites (i.e., Himeji Works, Sanda Works and Fukuyama Works) function as mother factories that manage our other 14 production sites in the Americas, Europe, and Asia.

Priority Environmental Issues

- Climate change
- Proper management of chemical substances in design/manufacturing
- Air/water/soil pollution due to operations/procurement

Message from Automotive Equipment Group

Making Contributions to International Society and the Environment through the Development of Fuel Efficiency Technologies

Given people's growing awareness of the environment, the automotive industry recognizes that fuel efficiency technologies represent a key to customer satisfaction and the future of their business. As a result, the Automotive Equipment Group focuses on products that can efficiently draw out energy from the engine and products that use this energy more efficiently to meet society's needs for more fuel-efficient vehicles.

Our electric power steering systems, engine control units and idling stop-and-start systems are essential for greater vehicle fuel efficiency. Consequently, we are focusing great efforts on developing products with added value, such as having higher efficiency and output and being more compact and lightweight. Our car navigation systems offer functions to search for the route with the best energy savings and evaluate the extent to which the driver is driving in an eco-friendly manner, aiding overall eco-friendly driving habits. In the future, we believe our next social mission will be to widely popularize electronic components used in electric vehicles (EVs) and hybrid electric vehicles (HEVs).

As local procurement and local production increase around the world, we are taking measures to reduce the environmental impact of our production activities and steadily enhancing our level of environmental management. To this end, we believe it is vital to ensure compliance with the environmental laws and product regulations of each country and region we are in, and for members of our group to closely collaborate with the mother factories in Japan.



Yutaka Ohashi
Representative Executive
Officer
Senior Vice President
In Charge of Automotive
Equipment

Initiatives Contributing to the Environment and Society

Fuel Efficiency Technologies for Internal-Combustion Engines

We are helping to make alternators, starters and electric power steering systems more fuel efficient with our proprietary compact, lightweight, high-performance and high-efficiency designs. Our idling stop-and-start systems, which link the engine control unit, transmission control unit, alternator, starter and electric oil pump, ensure reduced fuel consumption for customers.



Motor and controller for an electric power steering system

Electric-powered Products Contributing to the Dissemination of EVs/HEVs

We are optimizing Mitsubishi Electric's strengths in semiconductor device design, circuit design and structural design for EVs and HEVs in order to provide even more electric-powered products*.

* Electric-powered products: Products that contribute to promoting the use of electricity in automobiles by having equivalent or superior functions compared to devices driven by gasoline combustion.



EMIRAI 2 xEV concept car

Car Navigation Systems Helping to Conserve Energy

To make fuel efficiency more enjoyable for customers, we are developing and supplying car navigation systems that include a function to search for the route with the best energy savings to minimize fuel consumption, and a function to evaluate the extent to which the driver is driving in an eco-friendly manner.



DIATONE SOUND.NAVI audio navigation system

Promoting Proper Management of Chemical Substances in Design and Production

The Automotive Equipment Group is actively expanding its business globally and is striving to ensure compliance with REACH regulations, the ELV directive of the EU, and other environmental laws and regulations covering its activities and products around the world. Additionally, because the chemical substances management system of the International Material Data System (IMDS) has been introduced in the automotive industry, we are ensuring compliance with environmental guideline designs that consider the recyclability of automobiles.

Initiatives for Reducing Environmental Impact

Rolling Out Measures Implemented in Japan at Our International Sites

The Himeji Works, Sanda Works and Fukuyama Works in Japan are promoting the following measures, as well as introducing them throughout the Americas, Europe, and Asia.

- Lean manufacturing to avoid the 3 “M”s: *muda*, *mura*, *muri* (meaning “waste,” “variation,” and “overburden” in Japanese)
- Updating to more efficient equipment
- Improving operation using just-in-time activities
- Introducing initiatives to prevent air, water and soil pollution
- Sharing of best practices

Environment – Semiconductor & Device Group

Business Overview and Priority Environmental Issues

Delivering Key Devices Supporting Our Information-based Society to Customers around the World

Mitsubishi Electric's Semiconductor & Device Group delivers key devices supporting a sustainable, low-carbon society. Our extensive lineup includes power devices that control the motors of home appliances and industrial equipment, power devices that support high-efficiency electricity conversion, high-frequency devices used in everything from mobile phones to satellite communications, optical devices supporting high-speed optical communications, and TFT LCD modules that improve information interfaces. The development and manufacturing of these products take place at the Power Device Works, High Frequency & Optical Device Works, the LCD Division, and the sites of affiliates in Japan and overseas belonging to them. Each of these facilities is focused on developing low-power consumption products that minimize loss and on implementing energy-efficient manufacturing solutions, such as the use of high-efficiency air conditioners, given the fact that they consume large amounts of electricity during the production process to maintain cleanroom environments and other advanced production methods. In addition, to prevent further depletion of water resources, we are recycling and reusing the large volumes of pure water used in production processes and introducing chemical substance management systems to ensure proper management of products containing chemical substances.

Priority Environmental Issues

- Climate change
- Depletion of mineral resources
- Proper use of water in areas where we operate
- Proper management of chemical substances in design/production

Message from Semiconductor & Device Group

Helping Society Reduce its Carbon Footprint by Providing Products That Consume Less Power

The Semiconductor & Device Group provides inverters for home appliances, electric railways and industrial equipment, power conditioners that convert direct-current electricity from photovoltaic systems to alternating current and power devices equipped in power conversion equipment used in various power supply devices. The latest seventh-generation power devices are able to reduce power loss by 80% compared to first-generation models. We are currently developing next-generation silicon carbide (SiC) power devices and incorporating them into air conditioners and rolling stock because of the drastic reductions in energy usage this material achieves over conventional silicon. In response to the challenge of achieving energy efficiency in the IT industry, the Semiconductor & Device Group provides high-performance, high-efficiency and compact high-frequency devices and optical devices that feature composite semiconductor technologies for use in gigabit wireless communications equipment and optical fiber communications, thereby supporting the introduction of IT equipment with ultralow power consumption.

In the field of TFT LCD modules, we are using energy-saving, mercury-free white-light LEDs in TFT color LCD modules after developing an extensive lineup that spans from standard products to outdoor products with ultrahigh intensity. These white-light LEDs are also being supplied to a broad range of markets, including color TFT LCD modules for industrial applications, POS terminals, vending machines, ticket machines, displays for banks, in-vehicle displays and ship monitors.

In addition to focusing on the development of these low-power consumption products, the Semiconductor & Device Group is continually and proactively reducing its own energy usage with high-efficiency air conditioners and improvements in wafer treatment equipment operations because it requires cleanrooms



Toru Sanada
Executive Officer
In Charge of Semiconductor
& Device

with completely sterile environments that consume large quantities of energy.

Initiatives Contributing to the Environment and Society

Low Power Consumption Power Devices

Power devices have been developed and produced using silicon semiconductors, but are approaching a limit in terms of balancing low loss with high voltage to an advanced degree. As a result, we are developing new semiconductor devices that use silicon carbide (SiC), which offers low-power consumption capabilities and can be used in a wide range of applications. SiC power devices reduce loss by more than 70% during operation and offer higher speed switching compared to their silicon counterparts when used in inverters, for example. SiC power devices are now being used in our air conditioners for general consumers and in rolling stock inverters. In fiscal 2012, we developed a SiC power module with the world's largest capacity (1200A/1700V rating), which achieved a significant reduction in power loss when used in rolling stock inverters. In recognition of our efforts to develop and produce low-loss power semiconductors, the Power Device Works received the distinction of being chosen as "designated company" of the Green Asia International Strategic Comprehensive Special Zone, by Fukuoka Prefecture in September 2012.



SiC power module

Development of Communications Module That Suppresses Increases in Optical Transmission Power Consumption

As the result of introducing high-speed, high-capacity communications networks, "energy efficiency in IT" is becoming a global social issue. In response, we are developing high-frequency devices and optical devices that reduce the power consumption of IT equipment and systems. For our newly developed optical transmission modules, as a result of raising the maximum operable temperature, the heat exchange element used for cooling has been downsized, realizing an approximate 50% reduction in power consumption compared to conventional products.



Optical transmission module

Initiatives for Reducing Environmental Impact

Making Cleanrooms More Energy Efficient

The manufacturing of semiconductors and devices take place in cleanrooms with rigorous temperature, humidity and cleanliness controls to ensure product quality and reliability. In order to maintain the cleanroom environment, air conditioners that use about the same amount of energy as production equipment are necessary. As a result, we are replacing these air conditioners with high-efficiency models and raising the efficiency as well as improving the operations of wafer treatment equipment.

- **Use of High-efficiency Air Conditioners**

The Power Device Works in the Kumamoto Area has changed over to higher efficiency air conditioners and is now managing all units collectively. This has helped it to reduce annual electricity consumption by 16.6 million kWh (equivalent to 7,000t of CO₂).

- **Installation of Photovoltaic Systems**

Rooftop PV systems have been installed at the Sagami site and Power Device Works in the Fukuoka area, with ratings of 436kW and 300kW, respectively. Combined, these systems have helped us reduce annual electricity consumption by 710,000kWh (equivalent to 300t of CO₂).

- **Installation of Ice-Based Thermal Storage System**

The LCD Division uses nighttime power to create ice for its ice-based thermal storage system. This ice is then used to store cold energy for use in air conditioning. This system has helped to cut usage of power consumption during daytime hours and shift the division's peak electricity usage, as requested by the Japanese national government and power companies.

Utilizing Our Energy-saving Technologies in the Design Technology Building

The new design technology building at the Fukuoka-based Power Device Works is equipped with various environment-conscious features including improved insulation that reduces the load on air conditioners, LED lighting with motion and luminance sensors, natural lighting and natural ventilation. We have also introduced the Company's Facima system, which controls and manages energy consumption. This building has been recognized for its high environmental performance and was awarded the highest evaluation of "S Rank" under Fukuoka CASBEE*, a system that evaluates the environmental performance of buildings.

* CASBEE: Comprehensive Assessment System for Built Environment Efficiency. A standardized Japan-wide evaluation system jointly developed by industry/government/academia that evaluates the environmental performance of buildings according to ranks.

Ongoing Waste Reduction Activities

Each of our manufacturing sites achieved the goal of zero waste emissions from production processes in fiscal 2006. Since then, we have been promoting the more efficient use of materials at our sites and ways of turning waste into saleable materials, as part of our waste reduction activities.

Focusing on Water Recycling and Preventing Wastewater Contamination

Semiconductor production factories use large volumes of pure water. From the viewpoint of preventing further depletion of water resources, we are making efforts to reuse pure water. As part of this, we ensure removal of organic and inorganic contaminated impurities contained in the wastewater, and have established a system to process and recycle effluent.

Thorough Management of Chemical Substances

In order to quickly and accurately respond to customer inquiries related to information on the environmental impact of our products, we have introduced a chemical substances management system.

Environment – Information Systems & Network Service Group

Business Overview and Priority Environmental Issues

Delivering Optimal IT Services and Solutions to a Broad Range of Customers

Mitsubishi Electric's Information Systems & Network Service Group consists of the Information Systems Integration Division and three other companies: Mitsubishi Electric Information Systems Corporation, Mitsubishi Electric Information Network Corporation and Mitsubishi Electric Business Systems Co., Ltd. We provide optimal one-stop IT services and solutions in a host of fields, from public to corporate systems. We support our customers throughout the lifecycle, from the conceptual planning of information and network systems to development, operation and maintenance.

Priority Environmental Issues

- Climate change

Message from Information Systems & Network Service Group

Contributing to the Realization of a Low-Carbon Society through the Promotion of Various Green IT Services

Under the creed "Diamond Solutions – Comfort, Peace of Mind, Development," the Information Systems & Network Service Group is committed to enhancing customer satisfaction and helping achieve a sustainable society through its solutions tailored to the management strategies and challenges of its customers, as well as solutions that resolve social issues.

In recent years, we have also been focusing on environmentally effective businesses with green IT, which seeks to reduce environmental impact through the use of IT. Specifically, we are aggressively expanding our products and services that reduce environmental impact, such as those that curb power consumption through server integration and consolidation, reduce the need for business travel with video conferencing, and promote paperless work environments through ledger computerization. At the same time, in addition to green IT, we are also strengthening our data center solutions based on rising demand associated with BCP*1. Our cutting-edge proprietary technologies have helped companies to reduce data center power consumption approximately 36%*2 compared to their servers built and operated in-house. Energy-efficient data centers also help companies to reduce CO2 emissions from their business activities.

Going forward, in order to achieve smarter societies, we will leverage the many elemental technologies and strengths of the Mitsubishi Electric Group to build next-generation information systems using the latest IT solutions, such as M2M*3, Big Data and energy management systems including HEMS*4 and FEMS*5.

*1 BCP: Business Continuity Plan.

*2 Approximately 36%: Actual value achieved during a project where the user relocated an in-house server to our data center; includes server integration.

*3 M2M (Machine-to-Machine): A computer network where connected equipment mutually exchanges information without human involvement to automatically optimize control.

*4 HEMS: Home Energy Management System.

*5 FEMS: Factory Energy Management System.



Toru Yoshinaga
Executive Officer
In Charge of Information
Systems & Network Service

Initiatives Contributing to the Environment and Society

Using Data Centers to Help Customers Reduce Their Environmental Impact

We operate data centers, which are specialized facilities containing servers and communications equipment, through which we offer housing services where customer servers are relocated to one of our data centers, and hosting services, where we lease servers at our data centers to customers. Through these services, we are able to reduce the environmental impact of our customers through IT. We are also focused on making our data centers more eco-friendly with floor designs that make it possible to place servers in denser layouts by separating the cool airflow from air conditioners from the heat emitted by servers. Our data centers are also using electricity more efficiently thanks to the use of high-efficiency water-cooled air conditioners. These innovations have helped companies to reduce their CO₂ emissions by approximately 36% compared to their servers built and operated in-house. Furthermore, we have installed photovoltaic panels in an effort to reduce power consumption with clean energy, and planted greenery atop data center roofs to prevent the heat island effect. In addition to using the information infrastructure inside our data centers, we provide an IaaS*6 platform service that makes it possible to use resources more appropriately based on data processing volumes, which achieves further cost reductions and improvements in energy savings.

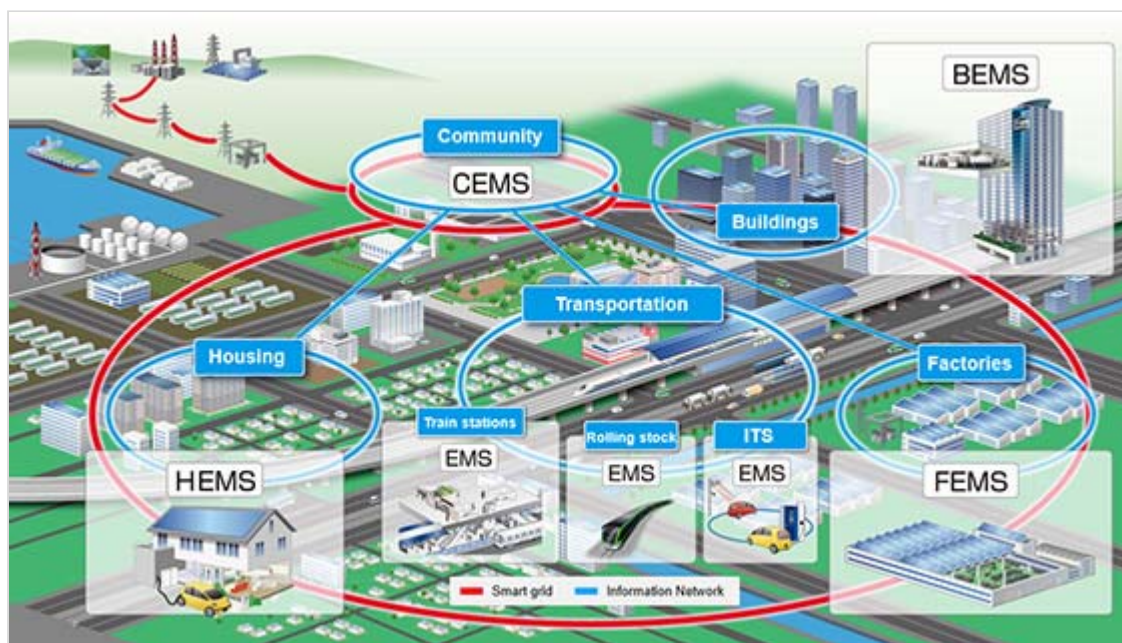


Data center

*6 IaaS (Infrastructure as a Service): A service that provides information infrastructure (servers, communication equipment, communication lines, etc.) over a network.

Promoting Initiatives to Realize Smart Communities

Given the increasing seriousness of global environmental issues such as climate change, deforestation and preservation of biodiversity, we are aiming to realize smart communities with optimally controlled energy throughout all areas, from power systems to home appliances. Based on energy management systems (xEMS) that link machines and IT and process the enormous amount of data collected from the machines, we contribute to optimized energy control in various fields such as home appliances and housing equipment, factories and buildings.



BEMS: Building Energy Management System
CEMS: Community Energy Management System
HEMS: Home Energy Management System
FEMS: Factory Energy Management System
ITS: Intelligent Transportation System

Initiatives for Reducing Environmental Impact

Continuous Activities Aimed at Reducing Environmental Impacts

The offices and factories of our companies are working continuously to reduce their environmental impact through energy-saving initiatives, sorting and reducing waste, upgrading fleet vehicles to fuel-efficient models, and improving the energy efficiency of logistics in procurement, product shipping and waste disposal.

Data Center Utilization

We are reducing environmental impact through the operation of energy-efficient data centers.

Promoting Computer Recycling

Following the enactment of Japan's Act on the Promotion of Effective Utilization of Resources on April 1, 2001, we established our own collection and recycling system for used business computers. We also set up a collection and recycling system for household personal computers after revisions were made to this law that took effect on October 1, 2003. Going forward, we will continue to develop recycling-friendly products as part of our commitment to increase the reuse and recycling of our products.

Promoting More Efficient Use of Energy and Resources

We are implementing a variety of initiatives to improve energy efficiency and reduce the use of resources.

- **Energy-saving Initiatives**

We implemented the following measures in fiscal 2012, which we continue to carry out today. These measures helped us reduce fiscal 2013 energy consumption by 30% compared to fiscal 2011.

- Relocation of servers to data centers. Stopped using server air conditioners that had been added inside offices.
- Changed computers to new models that use less electricity.
- Revised settings for demand controllers and curbed power usage.

- **Resource-saving Initiatives**

Starting in fiscal 2010, we set up recycling boxes for office paper on every floor. By upholding our commitment to office paper recycling, we reduced our fiscal 2012 usage by approximately 69% compared to fiscal 2009. Furthermore, in fiscal 2013, we set up dedicated recycling boxes in order to recycle paper cups used for our tea and coffee machines.