

Contents

Environment	1
About the Report	3
From the President	5
Environmental Report 2013	8
Highlights of Activities in Fiscal 2013	10
Targets and Achievements of the 7th Environmental Plan (Fiscal 2013–2015)	12
Data & Charts in Fiscal 2013	15
Period and Scope of the Report	16
Material Balance	17
Environmental Accounting	23
Environmental Performance Data	28
Awards	35
Initiatives toward Creating a Low–Carbon Society	38
Reducing CO ₂ from Product Usage	39
Expanding Our Contributions to Reducing CO ₂ from Product Usage	40
Reducing CO ₂ from Production	42
Reducing Emissions of Non–CO ₂ Greenhouse Gases	47
Reducing CO ₂ from Logistics	49
Initiatives toward Creating a Recycling–Based Society	51
Reducing Resource Inputs	52
Recycling End–of–Life Products	53
Initiatives toward Zero Final Waste Disposal Ratio	55
Reducing the Use of Disposable Packaging Materials	58
Using Water Effectively	60
Managing Chemical Substances	61
Environment–Related Business and Environmental Technology Development	63
Environment–Related Business	64
Environmental Technology R&D Results	65
Environmental Communication	68
Dialog with Stakeholders	69
Disclosure and Dissemination of Environmental Information	70
Mitsubishi Electric Outdoor Classroom	78
Product Environmental Data	81
Energy & Electric Systems	82
Ozone Generator	83

Contents

Super High–Efficiency Transformers	84
Super High–Efficiency Transformers - Detailed environmental data : RA-TS	85
Space–Saving Elevator System	87
Space–Saving Elevator System - Detailed environmental data : P9-CO-60, 6stop	88
Escalator	90
Escalator - Detailed environmental data : ZJ-S	91
Industrial Automation Systems	93
Electronic Hybrid Functional Control Panel	94
Computerized Numerical Controller	95
Computerized Numerical Controller - Detailed environmental data : M700VS Series	96
Wire Electric Discharge Machine	98
Wire Electric Discharge Machine - Detailed environmental data : NA1200	100
Wire Electric Discharge Machine - Detailed environmental data : NA2400	101
Electronic Multi–Measuring Instrument	102
Electronic Multi–Measuring Instrument - Detailed environmental data : ME110SSR / ME110SSR-4APH / ME110SSR-4A2P / ME110SSR-C	103
Energy Measuring Unit	105
Energy Measuring Unit - Detailed environmental data : EMU2-HM1-B	106
Laser Processing Machine	107
Laser Processing Machine - Detailed environmental data : eX Series	109
EPS Motor	111
Spindle Motor	112
Spindle Motor - Detailed environmental data : SJ-D	113
Three–Phase Motor	115
Three–Phase Motor - Detailed environmental data : SF-PR Series	116
Information & Communication Systems	118
Optical Network Unit	119
Optical Network Unit - Detailed environmental data : GE-PON ONU	120
Mitsubishi Logistics Information System: Dr. Logis	122
Integrated Environmental Information System	123
Environmentally Resistant Wide–Area Optical Ethernet Switch	124
WDM Optical Transmission Equipment	125
WDM Optical Transmission Equipment - Detailed environmental data : MF-800GWR	126
Information Equipment Recycling Service	128

Contents

Electronic Devices	130
DIIPM Module	131
DIIPM Module - Detailed environmental data : PS219B4	132
Laminated Bus Bar	134
Laminated Bus Bar - Detailed environmental data : Laminated bus bar	135
Contact Image Sensor	137
Contact Image Sensor - Detailed environmental data : UD2F200AX	138
<hr/>	
Home Appliances	140
LED Lighting	141
LED Lighting - Detailed environmental data : EL-D1411N/3W	142
Jet Towel Hand Dryers	144
Jet Towel Hand Dryers - Detailed environmental data : JT-SB116KN	145
Room Air Conditioners	147
Room Air Conditioners - Detailed environmental data : MSZ-ZW403S	149
Refrigerator	151
Refrigerator - Detailed environmental data : MR-JX60W	153
Photovoltaic Module	155
Photovoltaic Module - Detailed environmental data : PV-TJ235GA6	157
Photovoltaic Inverter	159
Photovoltaic Inverter - Detailed environmental data : PV-PNS04ATL-GER	160
Eco Cute for Household Use	162
Eco Cute for Household Use - Detailed environmental data : SRT-HP46W7	163
Eco Cute for Commercial Applications	165
Eco Cute for Commercial Applications - Detailed environmental data : QAHV-N560B	166
Ventilator	168
Ventilator - Detailed environmental data : V-08PD7 / V-08PX7	169
Energy Recovery Ventilator for Commercial Use	171
Lossnay Central Ventilator System	172
Lossnay Central Ventilator System - Detailed environmental data : VL-20ZMH3-L/-R	174

Contents

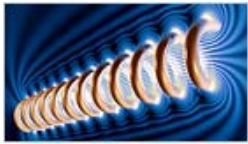
The Environment and Business	176
Public Utility Systems Group	178
Energy & Industrial Systems Group	181
Building Systems Group	184
Electronic Systems Group	188
Communication Systems Group	191
Living Environment & Digital Media Equipment Group	194
Factory Automation Systems Group	197
Automotive Equipment Group	202
Semiconductor & Device Group	204
Information Systems & Network Service Group	206



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.

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



A Model Business for a Sustainable Future

Establishing Japan's first large-scale, high-purity plastic recycling system.

- ▶ Plastic Recycling Comes of Age



Eco Changes: An Introduction

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

- ▶ Watch Video

From the President

True Dedication to Environmental Management

Chinese language version of the above page:

- ▶ 中文



The Environment and Business

Read about the environmental-based social contributions and corporate enhancements to strengthen our constitution being achieved through our products and services, as we present messages from business group leaders and showcase examples of specific initiatives being implemented.

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 Development
- ▶ Procurement
- ▶ Respecting Biodiversity

Environmental Sustainability Report

- ▶ Environmental Sustainability Report 2013
- ▶ 环境行动报告 2013

Environmental Report 2013

- ▶ Highlights of Activities in Fiscal 2013

Our Environmental Report covering the 7th Environmental Plan (fiscal years 2013-2015), along with initiatives and achievements in fiscal 2013

- ▶ Targets and Achievements of the 7th Environmental Plan
- ▶ Data & Charts in Fiscal 2013
- ▶ Initiatives toward Creating a Low-Carbon Society
- ▶ Initiatives toward Creating a Recycling-Based Society
- ▶ Managing Chemical Substances
- ▶ Environment-Related Business and Environmental Technology Development
- ▶ Environmental Communication
- ▶ Product Environmental Data

Chinese language version of the above page:

- ▶ 第7次环境计划(2012-2014年度)目标与成果

■ 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
- ▶ Respecting Biodiversity
- ▶ Guide to Environmental Technologies
- ▶ Archives

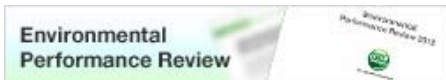
■ CSR Related Information

- ▶ About the Report
- ▶ Back Issues

■ Environment Site Map

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

Features



Read a digest version of the major topics found in the Environment section of this website.



Eco Changes: Find out how we're helping create a greener tomorrow.



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

About the 2012 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 2012 (year ending March 31, 2012). 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, 2011 – March 31, 2012

* Also includes some information on policies, targets and plans occurring after the close of fiscal 2012.

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, 114 domestic affiliates, and 68 overseas affiliates (total of 183 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 (2007), 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 3.0, 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.



Remaining Focused on Environmental Issues and Adhering Strictly to a Policy of Ethical and Legal Compliance

The Mitsubishi Electric Group positions ethical and legal compliance as the fundamental principle of its corporate management, and we are making committed efforts to strengthen internal controls while also focusing on employee education and training. As corporations come under an increasing level of public scrutiny and environmental regulations become more stringent, the ability of companies to comply with statutory and regulatory requirements is of vital importance. As we move forward, we will remain focused on environmental issues and adhere strictly to a policy of ethical and legal compliance in all aspects of our global activities.

Reducing CO2 Emissions During Production and Product Usage

Under the 7th Environmental Plan, in effect since fiscal 2013*, Mitsubishi Electric is focusing on reducing CO2 emissions during production and product usage.

While we understand that reducing the amount of CO2 emissions during production has less impact on the environment in absolute terms than reducing those during product usage, cutting back emissions during production is essential to strengthening our constitution as a manufacturer of goods and services. To this end, from the 7th Environmental Plan, we have started assessing our reduction efforts objectively using a per-unit indicator. This allows us to achieve our established targets without the assessments being overly influenced by changes in the surrounding economic environment.

Success in reducing CO2 emissions during product usage will depend on our approach to promoting the widespread use of highly energy-efficient products. As an environmentally advanced company that provides diverse products and systems in all parts of the world, the Mitsubishi Electric Group will continue to take a global approach to the development of highly efficient products with the ultimate aim of making positive contributions to people's lives and the environment.

* Fiscal year used here refers to the fiscal period starting on April 1st of the previous year and ending on March 31st of the year shown.



Creating Technologies and Products that Help Resolve Environmental Issues while Keeping an Eye on Supply Chains

To support the global expansion of our business, while recognizing our developed strengths, it is important that we maintain an unwavering commitment to localization and activities that best fit local conditions and needs based on respect for the legal system and the state of local industry infrastructure development in each country and region.

I am convinced that we possess world-class environmental technologies, a high sensitivity to ethical standards and a resilient spirit to overcome any challenge as evidenced in the wake of the 2011 Great East Japan Earthquake. I believe these strengths will provide strong impetus for environmental activities. Furthermore, our global expansion rests on our ability to instill these strengths in all members of the Group both in Japan and overseas, and on how we communicate and implement initiatives to ensure legal compliance and support environmental activities of all members within the context of global supply chains.

The business base supporting this localization is our strength in technologies and products, in demand globally. In this context, as part of our growth strategy, we plan to strengthen our environment and energy, and social infrastructure systems businesses, identifying them as key areas that can help to protect the environment. They possess the technological strengths and knowledge that were the basis of efforts to tackle and eventually overcome the pollution issues that arose as a result of Japan's period of rapid economic growth. We see it as our mission to globally expand the use of these environmental technologies that have produced these achievements, both in emerging countries seeking to establish robust social infrastructure and in developed countries working to renew theirs. In this way, we will fulfill our mission of contributing to the sustainable growth and development of society. In other businesses too, from the viewpoint of uncovering growth opportunities in global social issues, we will strive to further refine our technologies and products.

Incorporating Diverse Knowledge and Fostering Human Resources and Organizations Capable of Realizing a Sustainable Society

In promoting global business expansion and environmental activities, and aiming for ongoing improvements, it is vital to incorporate the knowledge and opinions of diverse people.

From a global perspective, the "knowledge" possessed by the Mitsubishi Electric Group could be seen as singular or uniform, a factor which has the potential to create weakness in periods of rapid change. As we expand our business globally, we will continue to create new value by striving to incorporate and acquire diverse knowledge, always keeping in mind the importance of learning from people in various countries and regions.

My mission as I work to steer the Mitsubishi Electric Group forward is two-fold: Bring together diverse human resources who are engaged in resolving global social issues, working in partnership with our stakeholders worldwide; and foster these human resources and organizations so that they are capable of producing technologies and products that contribute to resolving environmental issues.

Kenichiro Yamanishi
President & CEO
Mitsubishi Electric Corporation




Highlights of Activities in Fiscal 2013

Remarkable activities and achievements among environmental initiatives in fiscal 2013.






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 2013, vis-a-vis 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






Data & Charts in Fiscal 2013

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






Chinese language version of the above pages:

-  关于报告期间与范围
-  物料衡算

Initiatives toward Creating a Low-Carbon Society

-  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



Initiatives toward Creating a Recycling-Based Society

-  Reducing Resource Inputs
-  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

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




Environment-Related Business and Environmental Technology Development

-  Environment-Related Business
-  Environmental Technology R&D Results

Environmental Communication

-  Dialog with Stakeholders
-  Disclosure and Dissemination of Environmental Information
-  Mitsubishi Electric Outdoor Classroom

Product Environmental Data

-  Energy & Electric Systems
-  Industrial Automation Systems
-  Information & Communication Systems

▶ Home Appliances

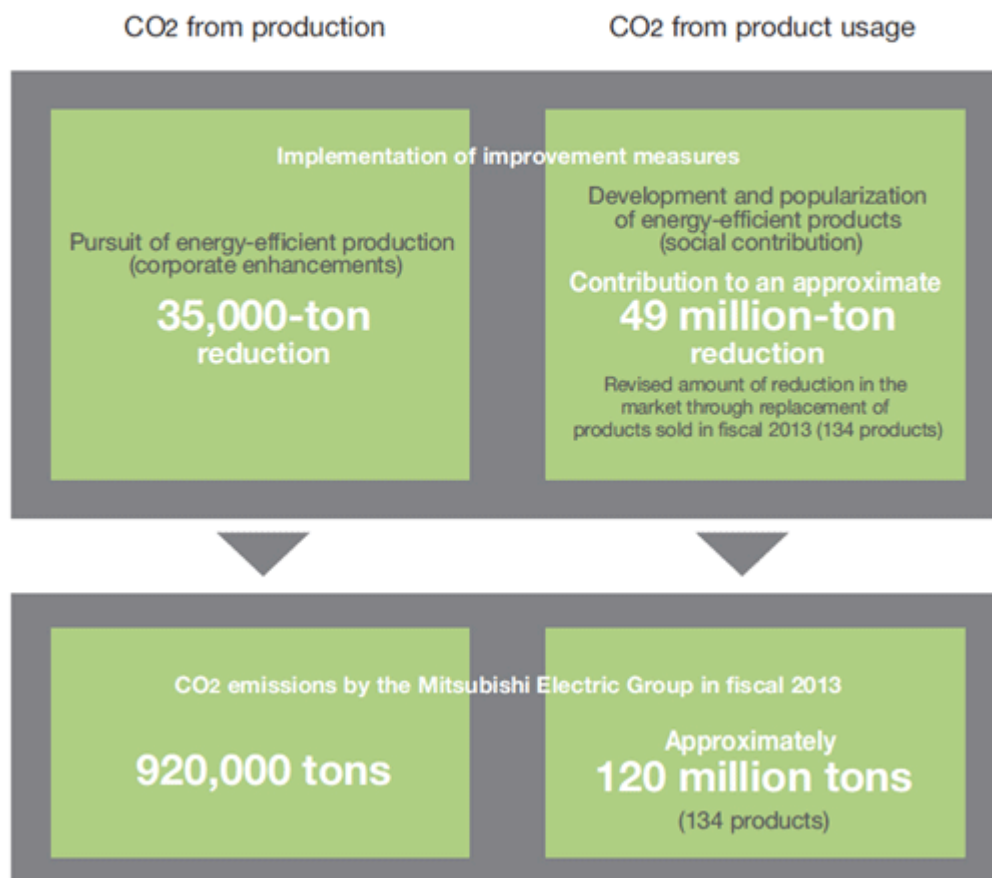
The 7th Environmental Plan Aims to Expand Contributions to Reducing CO₂ during Product Usage

A central pillar of the Mitsubishi Electric Group's Environmental Vision 2021 is the realization of a low-carbon society. In line with this vision, we aim to reduce CO₂ emissions by 30% during production and by 30% during product usage by fiscal 2021.

The 7th Environmental Plan (fiscal 2013-2015) targets reductions in CO₂ emissions during production as with previous plans, and further strengthens initiatives to cut CO₂ emissions from products and services by also focusing on reducing CO₂ emissions during product usage.

Contributing to the Creation of a Low-Carbon Society—Reducing CO₂ from Both Production and Product Usage

Total Fiscal 2013 CO₂ Emissions by the Mitsubishi Electric Group and the Effects of Our Improvement Initiatives



Recognizing Priority Items and Priority Initiatives in Each Business

In order to fulfill our responsibilities through both social contribution (reducing the environmental impact of products and services) and corporate enhancement to strengthen our constitution, we set priority items and priority initiatives matched to the nature of each of our businesses. An overview of these follows.



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 – 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


Contribution to reducing CO ₂ emissions from product usage		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Reduce CO ₂ emissions from product usage by improving product performance: average reduction rate for 84 products: 27%	Achieved average reduction rate of 29% for 109 products	
Increase amount of contribution to reducing CO ₂ emissions from product usage	Contribution to reduction of 49.03 million tons of CO ₂ for 134 products in Japan and overseas	

Reducing CO ₂ emissions from production					
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Fiscal 2013			Fiscal 2014	Fiscal 2015
	Target	Results	Self-evaluation	Target	Target
Improve CO ₂ emissions per unit of sales to 83% compared with fiscal 2011 (▲17%)	89%	96%		86%	83%


Reducing non-CO ₂ greenhouse gases		
Targets of 7th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Reduce non-CO ₂ greenhouse gases (SF ₆ PFC HFC) by 70% in comparison to fiscal 2006	Target achieved and maintained in Japan	



Initiatives Toward Creating a Recycling-Based Society



Final disposal ratio			
Targets of 7th Environmental Plan (Fiscal 2013–2015)		Progress in fiscal 2013	Self-evaluation
Mitsubishi Electric	Less than 0.1%	0.002%	
Affiliates (Japan)	Less than 0.1%	0.08%	
Affiliates (Overseas)	Less than 1.0%	1.55%	


Reducing resource inputs		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Average reduction rate for 64 products: 39% (compared with fiscal 2001)	Average reduction rate for 64 products: 32% (compared with fiscal 2001)	

Strengthening Our Environmental Management Foundation


Prevention of environmental accidents		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Prevention of environmental accidents	None	


Reduction of environmental liabilities		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
PCB waste treatment	Completed waste treatment on 66 machines	
Purification of groundwater and soil contamination	Evaluated results and countermeasures based on the results of investigation of the soil and groundwater condition caused by the change of land-use in 13 cases for Mitsubishi Electric and 4 cases for affiliated companies; confirmed all cases were processed appropriately	

Training of environmental personnel		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Train key environmental personnel	Conducted training of environmental personnel at manufacturing, non-manufacturing sites in Japan as well as 6 manufacturing sites in Thailand	
Foster environmental awareness and harmony with the community and nature	Held 38 Mitsubishi Electric Outdoor Classrooms in 31 regions and 47 Outdoor Classroom training sessions	

Publicity and advertising about environmental contribution		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Publicity and advertising about environmental contribution	<ul style="list-style-type: none"> Released environmental information via website and leaflets Increased environmental communications worldwide Continued corporate advertising series, showcasing delivering Mitsubishi Electric's prominent environmentally advanced technologies/products, launched in October 2012 	

Expanding Environment-Related Businesses

Expansion of environment-related businesses		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Expansion of environment-related businesses	Expanded environment-related businesses globally under interdivisional cooperation between manufacturing and sales, business segments, administration divisions and business divisions	

Creation of products with highly innovative environmental features		
Targets of 7 th Environmental Plan (Fiscal 2013–2015)	Progress in fiscal 2013	Self-evaluation
Creation of products with highly innovative environmental features: have each business unit select one or more products	Ongoing efforts to achieve the fiscal 2015 target	

■ 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

Report on the environmental impacts that accompany our business activities, following the lifecycle of "factory," "logistics," "product," and "recycle."

Chinese language version of the above page:

- ▶ 物料衡算

■ Environmental Accounting

Report on fiscal 2013 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 2013 activities, examples of domestic and overseas activities related to respecting biodiversity, and participation in exhibitions and events.

■ Awards

Awards received in Japan and overseas.

Basic Policy and Approach to Environmental Management / Period and Scope of Environmental Report 2013

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 2013. 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, 2012 – March 31, 2013

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

Scope of the Report

Covers the activities of Mitsubishi Electric Corporation, 116 affiliates in Japan, and 72 overseas affiliates (total of 189 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

Overall Environmental Impact

Period: April 1, 2012 - March 31, 2013

Scope of Data Compilation : Mitsubishi Electric Corporation, 116 affiliates in Japan and 72 overseas affiliates (total of 189 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	130,000 tons	320,000 tons
Manufacturing			
Electricity	980 million kWh	330 million kWh	330 million kWh
Natural gas	22,320,000 m ³	1,860,000 m ³	11,640,000 m ³
LPG	1,813 tons	2,363 tons	686 tons
Oil (crude oil equivalent)	6,444 kl	3,227 kl	2,032 kl
Water	6,990,000 m ³	1,850,000 m ³	1,780,000 m ³
Public water	1,240,000 m ³	430,000 m ³	460,000 m ³
Industrial water	2,110,000 m ³	290,000 m ³	1,100,000 m ³
Groundwater	3,640,000 m ³	1,130,000 m ³	30,000 m ³
Others	0 m ³	0 m ³	190,000 m ³
Reuse of water	3,230,000 m ³	1,660,000 m ³	130,000 m ³
Controlled chemical substances (amounts handled)	6,786 tons	1,835 tons	2,212 tons
Ozone depleting substances (amounts handled)	1.4 tons	165 tons	913 tons
Greenhouse gases (amounts handled)	3,141 tons	52 tons	693 tons
Volatile organic compounds (amounts handled)	1,348 tons	1,397 tons	219 tons

1: Materials: Sum of 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	6,240,000 m ³	1,200,000 m ³	1,100,000 m ³
	Controlled chemical substances	7.0 tons	0.0 tons	40.9 tons
	BOD (biological oxygen demand)	106.5 tons	3.3 tons	17.7 tons
	COD (chemical oxygen demand)	17.8 tons	3.6 tons	42.0 tons
	Nitrogen	74.5 tons	14.7 tons	1.6 tons
	Phosphorus	5.9 tons	0.2 tons	0.2 tons
	Suspended solids	74.3 tons	5.8 tons	23.6 tons
	n-hexane extracts (mineral)	0.9 tons	0.2 tons	1.1 tons
	n-hexane extracts (active)	4.4 tons	0.1 tons	0.2 tons
	Total emissions of zinc	0.3 tons	0.0 tons	0.1 tons
Emissions into the atmosphere	Carbon dioxide (CO ₂)	481,000 tons-CO ₂	167,000 tons-CO ₂	269,000 tons-CO ₂
	Controlled chemical substances (excluding amounts contained in other waste)	545.3 tons	136.0 tons	232.6 tons
	Ozone depleting substances	0.0 ODP tons	0.0 ODP tons	0.7 ODP tons
	Greenhouse gases	86,000 tons-CO ₂	44,000 tons-CO ₂	66,000 tons-CO ₂
	Volatile organic compounds	532.9 tons	275.0 tons	25.0 tons
	Sulfur oxide (SO _x)	1.3 tons	0.6 tons	4.9 tons
	Nitrogen oxide (NO _x)	9.1 tons	53.4 tons	8.0 tons
	Fly ash	0.9 tons	1.3 tons	18.8 tons
Amount of CFCs recovered		1.9 tons	237.0 tons	—
Waste				
Total waste emissions		82,536 tons	60,432 tons	60,643 tons
Amount recycled		72,006 tons	49,830 tons	58,445 tons
Waste treatment subcontracted out		40,917 tons	39,884 tons	59,388 tons
Final disposal		1 tons	46 tons	943 tons
In-house weight reduction		3 tons	0 tons	142 tons
Products 2				

Weight of all "DfE" Products sold	1,860,000 tons	60,000 tons	220,000 tons
Weight of packaging materials	47,000 tons	7,000 tons	40,000 tons

2: Products: Weight related to "Design for the Environment" (DfE) products.

IN

Sales and Logistics ³			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Fuel for trucks (gasoline)	11,659 kl	1,758 kl	264 kl
Fuel for trucks (diesel)	25,090 kl	5,035 kl	19,674 kl
Fuel for rail (electricity)	2,198 Mwh	518 Mwh	0 Mwh
Fuel for marine transport (bunker oil)	355 kl	0 kl	52,987 kl
Fuel for air transport (jet fuel)	507 kl	124 kl	16,448 kl

3: Sales and logistics: Includes 11 sales companies in Japan. Figures for overseas affiliated companies include transportation between countries.



OUT

Emissions ⁴			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Carbon dioxide (CO ₂)	95,000 tons-CO ₂	18,000 tons-CO ₂	247,000 tons-CO ₂

4: Emissions: Includes 11 sales companies in Japan. Figures for overseas affiliated companies include transportation between countries.

IN

Energy Consumption			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Amount of energy consumption of 134 products targeted for contribution in reducing CO ₂ emissions from product usage	290,400 million kWh	7,000 million kWh	3,500 million kWh



OUT

Emissions			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Amount of CO ₂ emissions of 134 products targeted for contribution in reducing CO ₂ emissions from product usage	122,550,000 tons-CO ₂	2,950,000 tons-CO ₂	1,480,000 tons-CO ₂



IN

End-of-Life Products ⁵	
	Mitsubishi Electric
Air conditioners	13,624 tons
Televisions	5,087 tons
Refrigerators	21,403 tons
Washing machines / Clothes dryers	7,555 tons
Personal computers	41 tons

5: End-of-Life Products: Weight of products taken back and weight of recovered resources of four types of appliances subject to Japan's Home Appliance Recycling Law, plus personal computers.



OUT

Resources Recovered ⁶	
	Mitsubishi Electric
Metals	27,649 tons
Glass	2,055 tons
CFCs	284 tons
Others	11,769 tons

6: Resources Recovered: Weight of products taken back and weight of recovered resources of four types of appliances subject to Japan's Home Appliance Recycling Law, plus personal computers.

Scope and Period of Data Compilation and Basis of Calculation

- Period: April 1, 2012 - March 31, 2013
- Scope of Data Compilation: Mitsubishi Electric Corporation, 116 affiliates in Japan and 72 overseas affiliates (total of 189 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 2013

Environmental Conservation Costs

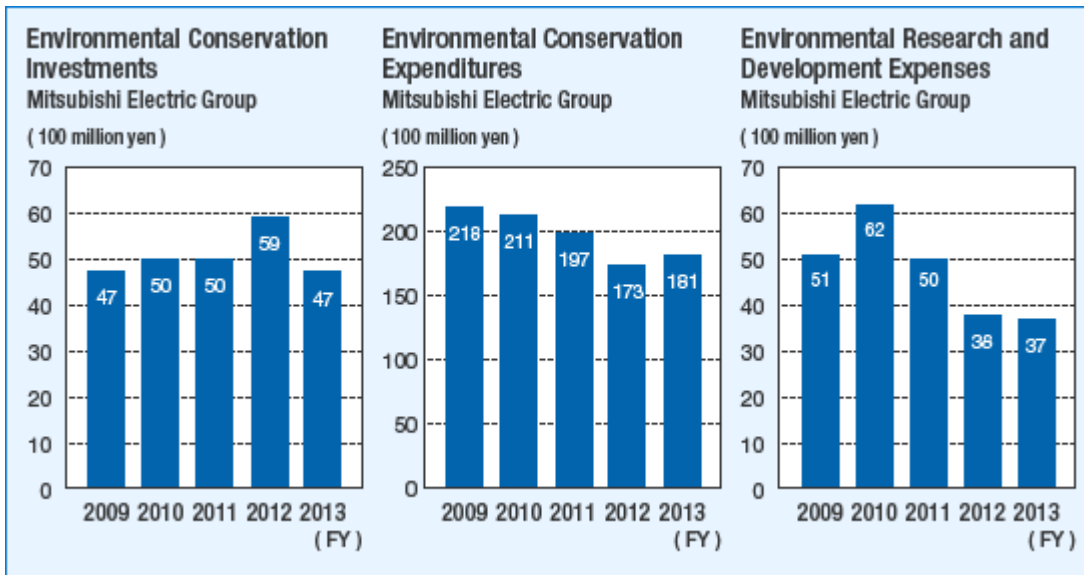
Environmental capital investment for fiscal 2013 decreased compared to the previous fiscal year, while environmental costs increased over the previous fiscal year.

- Environmental Capital Investment**

Capital investment for the Mitsubishi Electric Group as a whole stood at ¥4.7 billion (a ¥1 billion decrease compared to the previous fiscal year) and ¥3.4 billion for Mitsubishi Electric (a ¥0.5 billion decrease over the previous year). Although the value of capital investment declined in comparison to major capital investments made in fiscal 2012, in fiscal 2013 the Group continued to make investments in energy efficiency measures that included upgrading of air conditioners, installation of PV systems, and green IT through server upgrades.

- Environmental Costs**

Environmental costs for the Mitsubishi Electric Group as a whole were ¥18.1 billion (a ¥0.8 billion increase from the previous fiscal year), and ¥13.8 billion for Mitsubishi Electric (a ¥1.2 billion increase from the previous fiscal year). Upstream and downstream costs alone increased by ¥400 million. This was due to Mitsubishi Electric enhancing the management of chemical substances contained in products to comply with the EU's RoHS directive and REACH regulation.



Environmental Conservation Benefits (Environmental Performance)

Total energy inputs for the Mitsubishi Electric Group in fiscal 2013 declined compared to the previous fiscal year because of the effects realized from the proactive installation of energy-saving equipment. At the same time, waste emissions on a consolidated basis for the Mitsubishi Electric Group increased in terms of both gross volume and per unit of sales. This was due to increased production volume at overseas affiliates.

Economic Benefits from Environmental Conservation Activities (Actual Benefits)

Mitsubishi Electric achieved actual benefits in terms of cutting back on its electricity charges by installing PV systems as well as high-efficiency air conditioners and lighting fixtures. As a result, the entire Mitsubishi Electric Group saw a significant increase in its actual benefits as well.

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

Mitsubishi Electric achieved reductions in its energy costs by advancing energy savings through solutions that included PV systems, heat-pump water heater systems, room air conditioners and Lossnay total heat exchange ventilator fans.

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	45.8	100.4	1.1	-
	32.5	67.9	3.3	
Pollution prevention	2.6	23.2	(3.6)	Maintenance of wastewater treatment facilities and exhaust treatment facilities, water quality survey costs, chemicals for maintenance and inspection of specific facilities (septic tanks), etc.
	0.6	15.5	(1.6)	
Global environmental conservation	43.0	47.3	2.8	Upgrading of air conditioners, installation of LED lighting and PV systems
	31.9	33.2	2.4	
Resource recycling	0.2	29.8	1.9	Recycling of saleable materials
	0.0	19.2	2.6	
Upstream and downstream from production	0.6	9.8	3.5	Green Accreditation questionnaire survey, acquisition of non-inclusion certificates for chemical substances, EU REACH compliance survey
	0.3	7.8	4.0	
Management activities	0.0	30.3	1.8	Maintenance of ISO 14001 certification, education for new employees, PRTR, waste management system usage fees
	0.0	24.0	1.3	
R&D activities	0.3	36.8	(0.7)	Activities related to refrigerant development, smart grid/HEMS/BEMS development, high-purity plastic recycling technology, energy efficiency, weight reduction, etc.
	0.3	34.9	0.8	
Community activities	0.0	0.3	(0.0)	Station-to-Workplace Clean Campaign, Groundwater Resource Fund, Mitsubishi Electric Outdoor Classroom, Satoyama woodland preservation activities
	0.0	0.2	(0.0)	
Environmental damage	0.0	3.0	2.0	Installation of ground water purification equipment and analysis, etc.
	0.0	3.0	2.0	
Consolidated total	46.8	180.6	7.8	
Non-consolidated total	33.0	137.7	11.4	-

* 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 2013	Year-on-Year Change	Year-on-Year Per Net Sales
Total energy used	10,000 GJ	1,842	(74)	98%
		1,091	(97)	96%
Total water used	10,000 m ³	1,062	(2)	102%

			699	(29)	101%
Total greenhouse gas emissions	10,000 tons CO ₂		111	(6)	97%
			57	(6)	95%
CO ₂ (energy consumption)	10,000 tons CO ₂		92	(2)	100%
			48	(2)	100%
HFC,PFC,SF ₆	10,000 tons CO ₂		20	(5)	82%
			9	(3)	76%
Total releases and transfers of chemical substances into the atmosphere	Tons		833	(53)	96%
			533	(8)	103%
Total wastewater discharged	10,000 m ³		854	(69)	94%
			624	(39)	99%
Total releases and transfers of chemical substances into the water and soil	Tons		48	(1)	99%
			7	(1)	97%
Total waste discharged	Tons		203,611	9,355	107%
			82,536	344	105%
Final disposal	Tons		991	46	107%
			1	(0)	86%

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	42.7	7.5	Cost of selling the saleable materials resulting from recycling of scrap metal, etc.
	14.7	(1.6)	
Savings	40.1	(194.1)	Reduction in electricity costs from installation of PV systems and energy-saving air conditioning equipment and lighting fixtures; reduction in the use of packaging and of manufactured items to be used in products, etc., through a shift to returnable items
	24.3	(66.2)	
Total	82.8	(186.6)	-
	39.1	(67.8)	

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

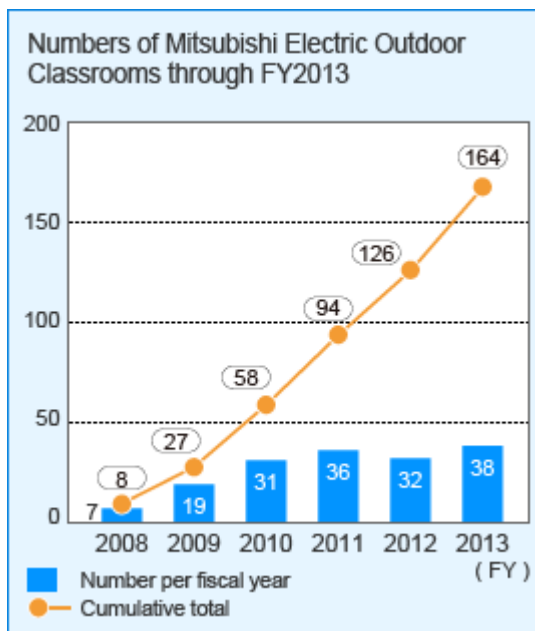
Top figure: Mitsubishi Electric Group (consolidated basis) / Bottom figure: Mitsubishi Electric / Unit: 100 million yen

Item	Amount	Main Products
Economic benefits to customers	19,611	PV systems; heat-pump water heater systems; room air conditioners; Lossnay total heat exchange ventilator fans; refrigerators; LCD display monitors; turbine generators; monitoring, preservation and control equipment for thermoelectric generation and in-house power plants; backbone optical transmission systems; optical/wireless access systems
	19,227	

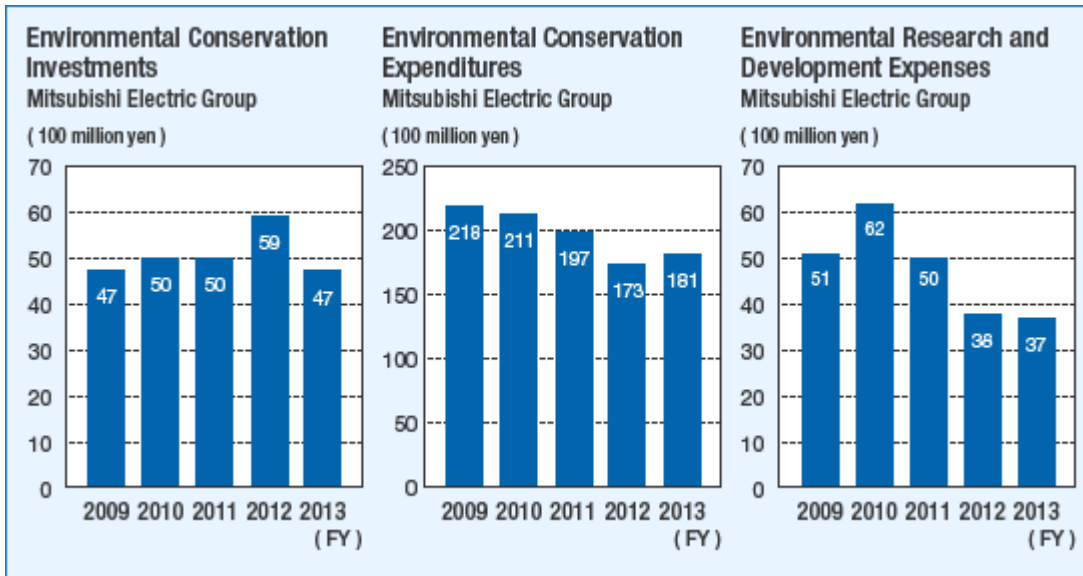
Results of Activities in Fiscal 2013

- Numbers of Classroom Leaders Trained through FY2013
- Numbers of Mitsubishi Electric Outdoor Classroom through FY2013
- Environmental Accounting
- Plan for Reducing CO2 from Product Usage through Improved Energy Efficiency
- Plan to Reduce CO2 from Production Across the Mitsubishi Electric Group
- Reduction in greenhouse gas emissions
- Emissions of Non-CO2 Greenhouse Gases
- Total CO2 Emissions [Mitsubishi Electric and affiliates in Japan]
- Fiscal 2013 Share of Transport by Mode [Mitsubishi Electric and affiliates in Japan]
- Plan for Reducing Resource Inputs
- 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

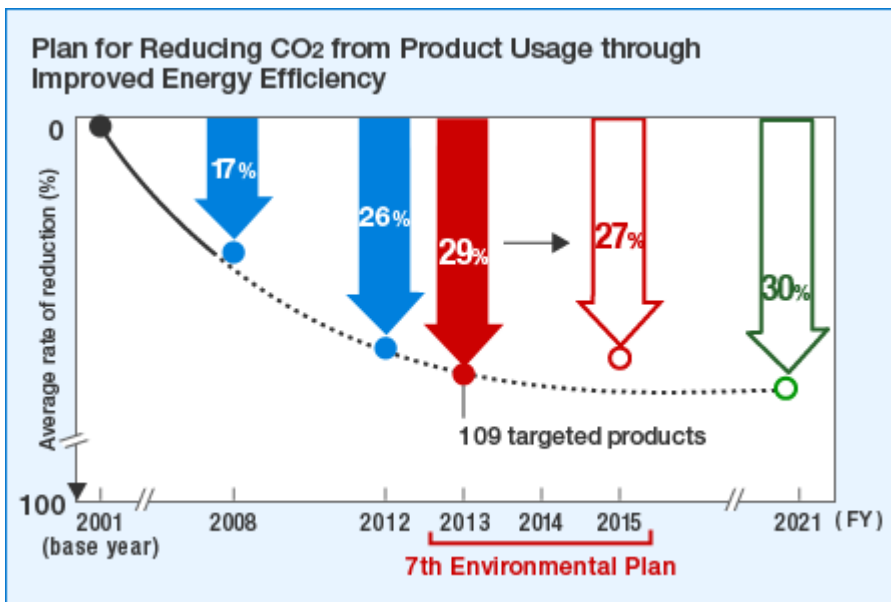
Training of Environmental Personnel

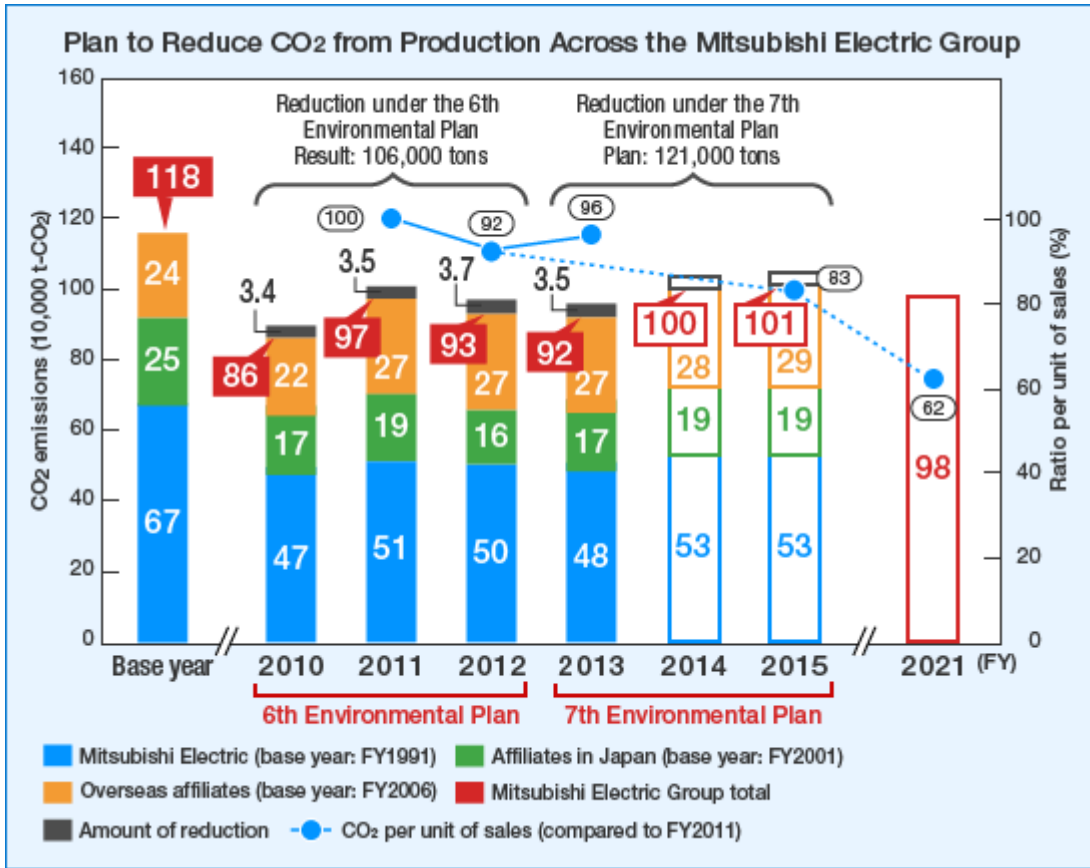


Environmental Accounting

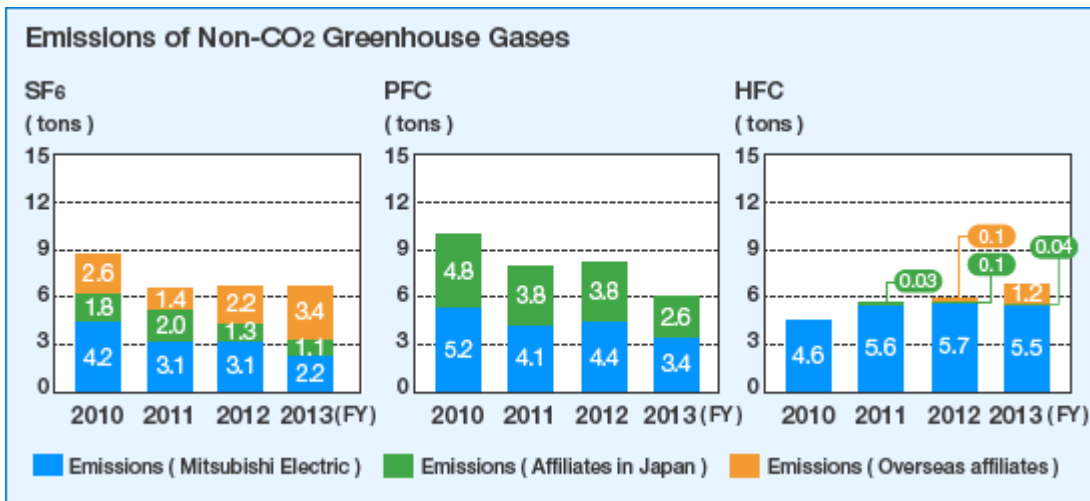
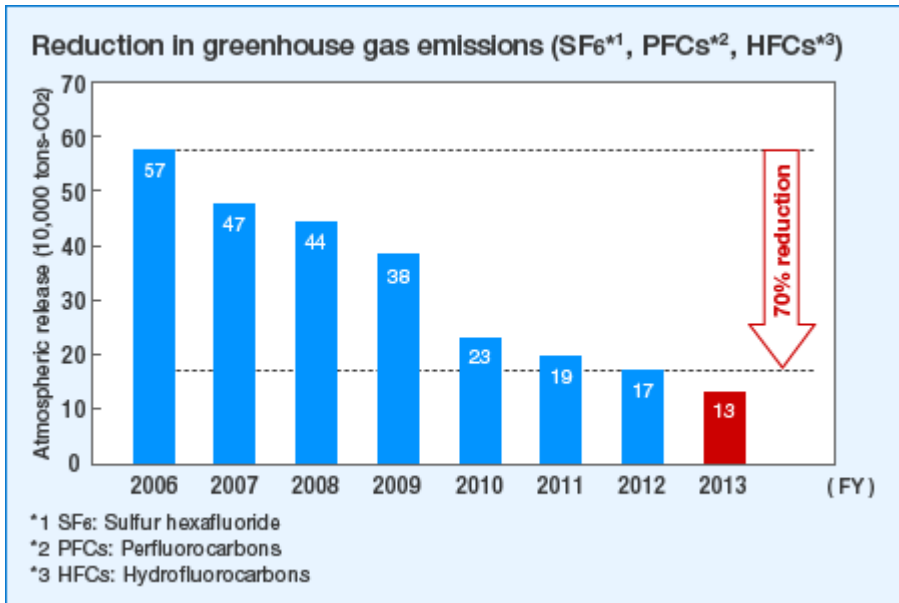


Reducing CO2 from Product Usage

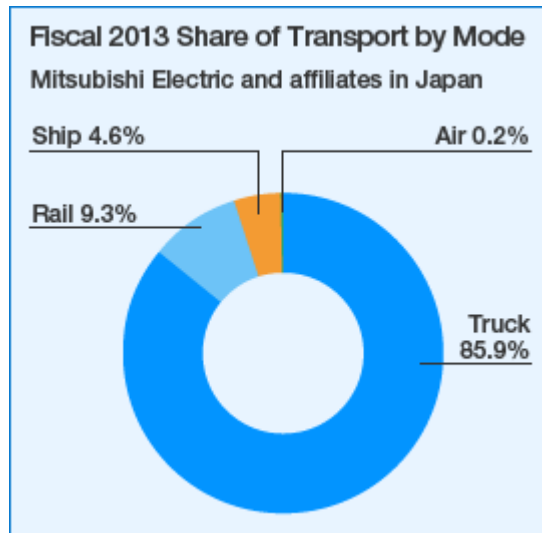
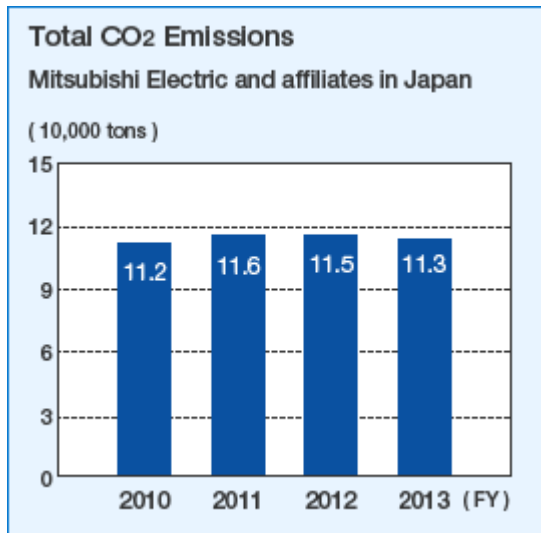




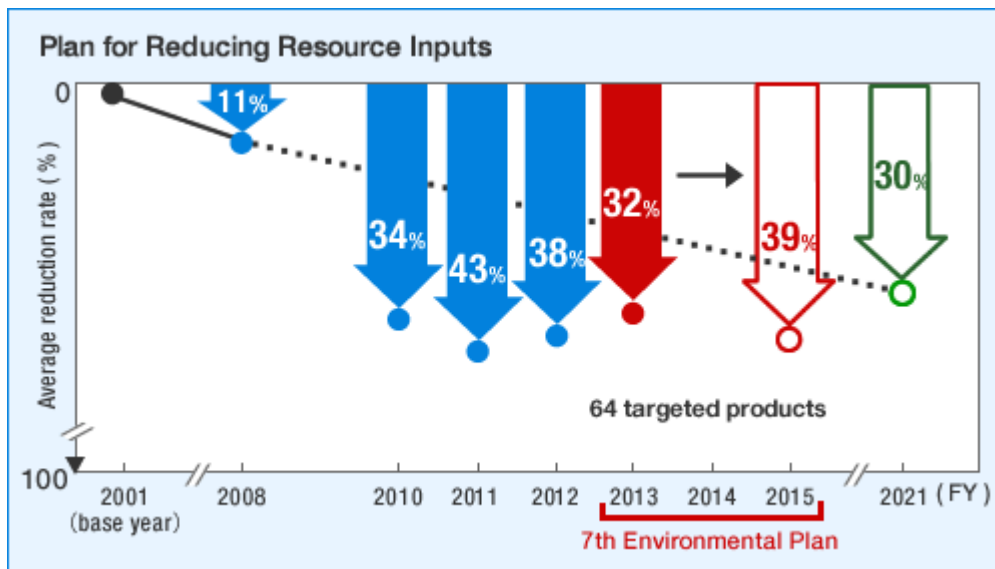
Reducing Emissions of Non-CO₂ Greenhouse Gases



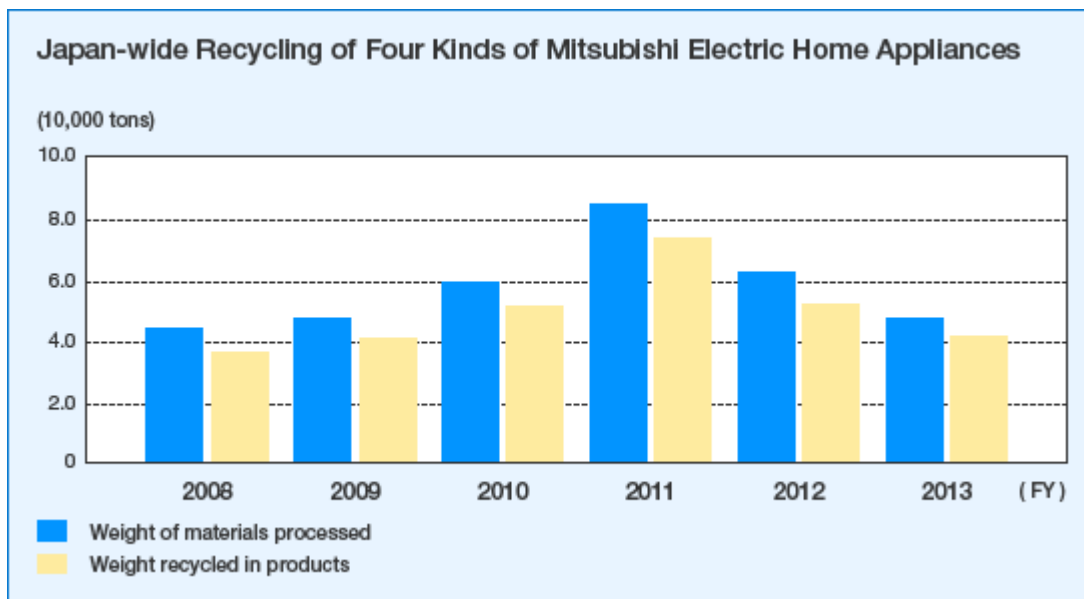
Reducing CO2 from Logistics



Reducing Resource Inputs

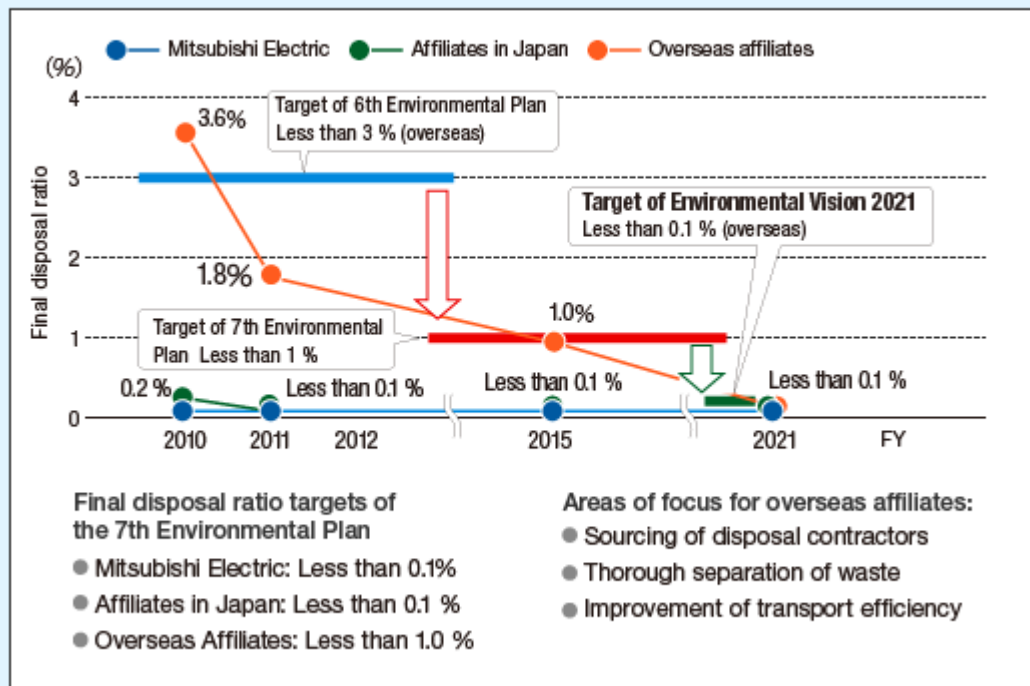


Reducing End-of-life Products

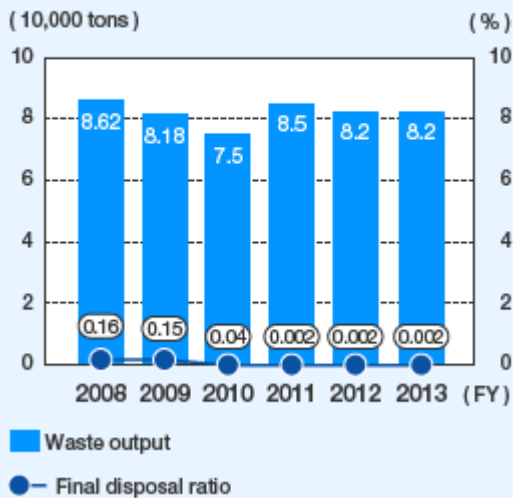


Initiatives toward Zero Final Waste Disposal Ratio

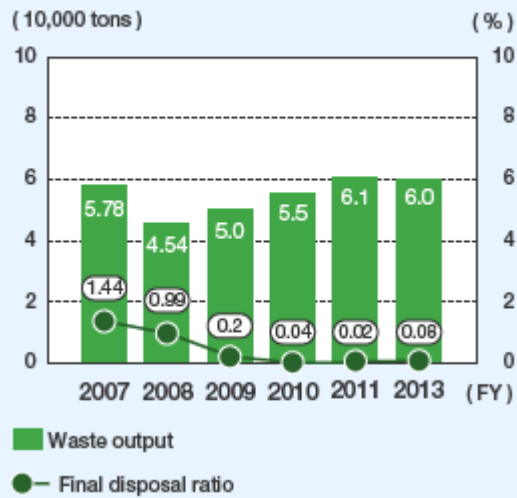
Final Waste Disposal Ratio Reduction Plan



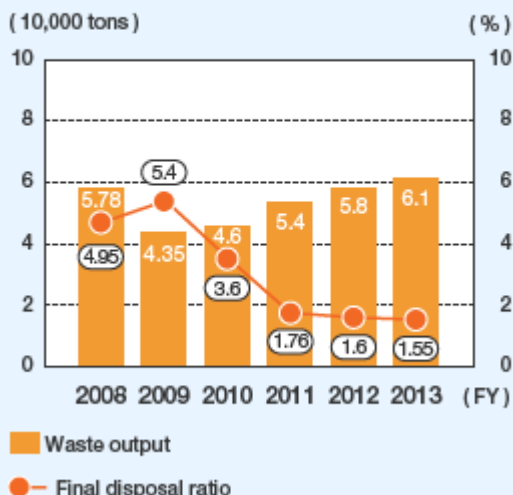
Total Waste Output Mitsubishi Electric



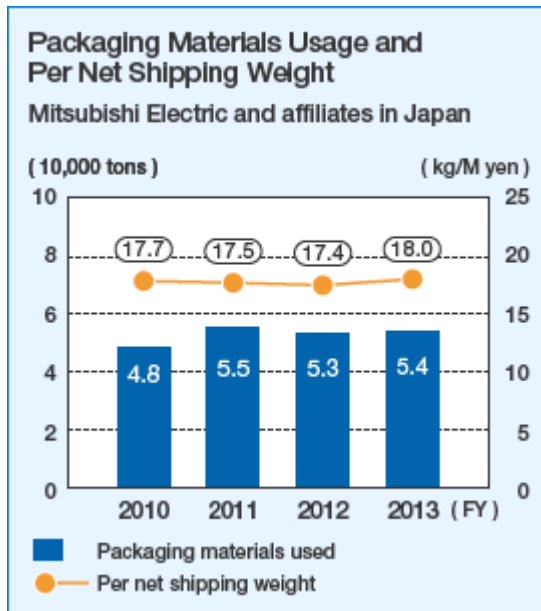
Total Waste Output Affiliates in Japan



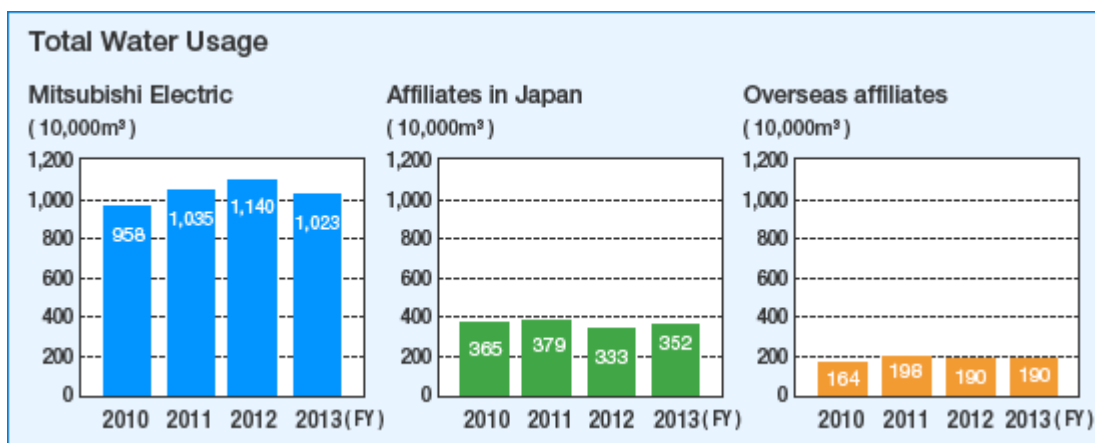
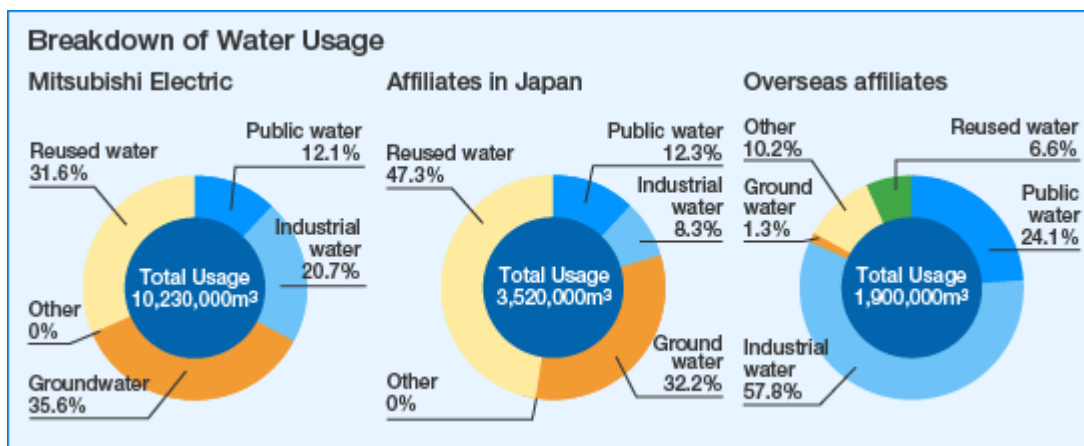
Total Waste Output Overseas affiliates

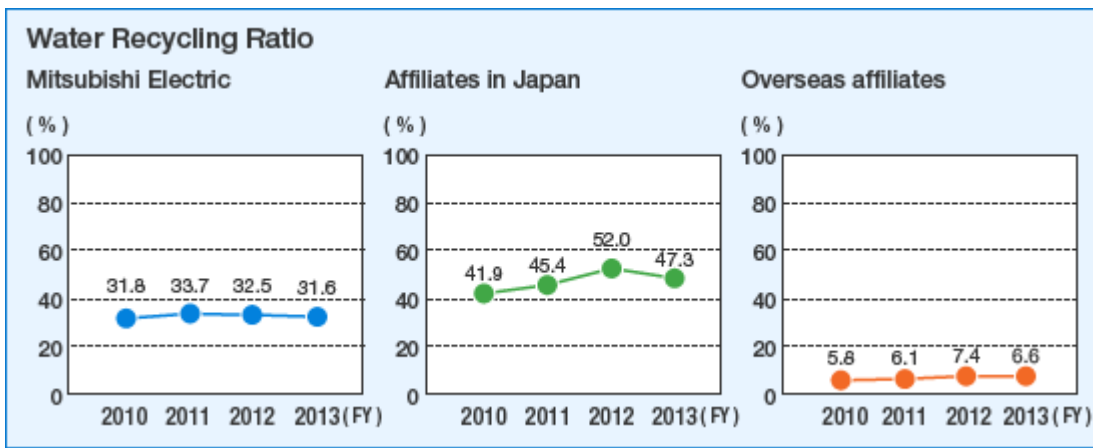


Reducing the Use of Disposable Packaging Materials



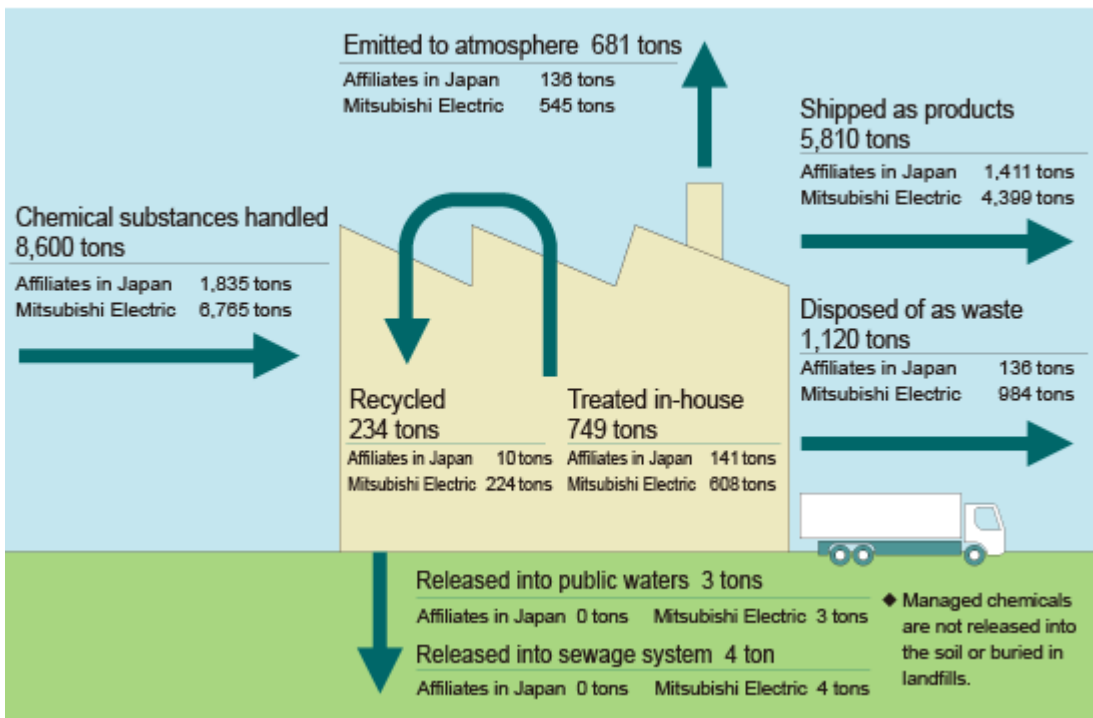
Using Water Effectively





Managing Chemical Substances

Material Balance of Chemical Substances Subject to Regulation



Japan

Award	Sponsor	Description / Product	Awardee
2012 (61st) Commendation for Achievements in Electrical Industry Technology, Award for Excellence	The Japan Electrical Manufacturers' Association (JEMA)	Use of spring-operated gas-blast circuit breaker Development and commercialization of 550kV gas-insulated switchgear	Mitsubishi Electric Transmission & Distribution Systems Center
2012 (61st) Commendation for Achievements in Electrical Industry Technology, Award for Excellence	The Japan Electrical Manufacturers' Association (JEMA)	Development of IH cook top with the “bikkuring” coil for any size pot or pan	Mitsubishi Electric Home Appliance Co., Ltd.
2012 (61st) Commendation for Achievements in Electrical Industry Technology, Honorable Mention Award	The Japan Electrical Manufacturers' Association (JEMA)	Development of the Kirigamine ZW/ZX Series of air conditioners that ensure both comfort and energy efficiency	Mitsubishi Electric Shizuoka Works
2012 (61st) Commendation for Achievements in Electrical Industry Technology, Honorable Mention Award	The Japan Electrical Manufacturers' Association (JEMA)	Development of a control moment gyroscope for controlling satellite orientation as well as a satellite motion simulator	Mitsubishi Electric Advanced Technology R&D Center
Good Eco Business Site Certification, City of Nagoya	Nagoya City	Received certification as Good Eco Business Site after being recognized for having a strong commitment to voluntarily and actively implementing environmentally friendly measures	Mitsubishi Electric Chubu Branch Office
Osaka Mayor's Award (Building Waste Reduction Award)	Osaka City	Awarded for efforts in promoting office waste reduction and proper disposal for many years, and for greatly contributing to the development of Osaka City	Mitsubishi Electric Kansai Branch Office
The Japan Electric Association Kanto Branch Electrical Worker Achievement Awards, Invention Award	The Japan Electric Association Kanto Branch	Development of partial discharge sensor for gas-insulated switchgear	Mitsubishi Electric Information Technology R&D Center and Transmission & Distribution Systems

			Center
The Japan Electric Association Chubu Branch Electrical Worker Achievement Awards, Invention Award	The Japan Electric Association Chubu Branch	Development of high-productivity three-axis orthogonal CO2 laser processing machine (eX Series)	Mitsubishi Electric Nagoya Works
2011 Commendation for Excellent Energy Equipment, the Agency for Natural Resources and Energy Director's Award	The Japan Machinery Federation (JMF)	High-productivity three-axis orthogonal CO2 laser processing machine (eX Series)	Mitsubishi Electric Nagoya Works
5th Robot Award, JMF Chairman's Award	Ministry of Economy, Trade and Industry, The Japan Machinery Federation (JMF)	F Series of intelligent assembly robots	Mitsubishi Electric Nagoya Works, Mitsubishi Electric Advanced Technology R&D Center
Good Design Award 2012	Japan Institute of Design Promotion (JDP)	VL-11Z and VL-95ZF-SH Lossnay Central Ventilation System (ceiling cassette type) with 24-hour ventilation and total heat exchanger	Mitsubishi Electric Industrial Design Center
Good Design Award 2012	Japan Institute of Design Promotion (JDP)	Room air conditioner F Series	Mitsubishi Electric Industrial Design Center
Good Design Award 2012	Japan Institute of Design Promotion (JDP)	MV Series of wire-cut electrical discharge processing machines	Mitsubishi Electric Industrial Design Center
Good Design Award 2012	Japan Institute of Design Promotion (JDP)	RV-F Series	Mitsubishi Electric Industrial Design Center
Good Packaging Award, Japan Packaging Contest 2012	Japan Packaging Institute	Eco-friendly packaging for duct ventilation fan (for interior use)	Mitsubishi Electric Nakatsugawa Works Mitsubishi Electric Engineering Co., Ltd. Nakatsugawa Engineering Office
Good Packaging Award, Japan Packaging Contest 2012	Japan Packaging Institute	Development of paper packaging container for small-lot shipments	Symex Corporation Mitsubishi Electric Logistics Corporation
2012 Energy Conservation Grand Prize, Energy Conservation Division, the Agency for Natural Resources and Energy Director's Award	The Energy Conservation Center, Japan (ECCJ)	Energy conservation activities involving all employees that helped cut peak electricity usage by 30%	Mitsubishi Electric Gunma Works
2012 Energy Conservation Grand Prize, Energy	The Energy Conservation Center, Japan (ECCJ)	Efforts to become a leading factory in energy conservation	Mitsubishi Electric Sanda Works

Conservation Division, ECCJ Chairman's Award			
2012 Energy Conservation Grand Prize, Product / Business Model Division, ECCJ Chairman's Award	The Energy Conservation Center, Japan (ECCJ)	MJ-120GX dehumidifier for drying clothing	Mitsubishi Electric Home Appliance Co., Ltd.
21st Hyogo Prefecture Eco-friendly Business Award	Hyogo Prefecture	Recognized for its business activities that value the environment and natural resources and contribute to new lifestyles for residents	Mitsubishi Electric Sanda Works
60th Electric Science and Engineering Promotion Award, Electric Science and Engineering Promotion Award	The Promotion Foundation for Electrical Science and Engineering	Development and commercialization of compact gas-insulated switchgear and gas/solid hybrid insulation realizing reduced use of SF ₆ gas	Mitsubishi Electric Advanced Technology R&D Center
60th Electric Science and Engineering Promotion Award, Electric Science and Engineering Promotion Award	The Promotion Foundation for Electrical Science and Engineering	High-performance ink sheet rewinding technology	Mitsubishi Electric Information Technology R&D Center, Kyoto Works
44th Ichimura Industrial Award, Contribution Award	The New Technology Development Foundation	Development and increased mass production of high-efficiency motor using rotary iron core	Mitsubishi Electric Corporation, Manufacturing Engineering Center
2012 Chugoku Bureau of Economy Trade and Industry Director General's Award for Good Businesses	Chugoku Bureau of Economy, Trade and Industry, The Energy Conservation Center, Japan Chugoku Branch, and Chugoku Regional Electricity Usage Rationalization Committee	Recognized for outstanding achievements in energy conservation	Miyoshi Electronics Corporation Hiroshima Site

Overseas

Award	Sponsor	Description / Product	Awardee
"National Heat Pump Awards" Heat Pump industry innovation of the year	Chartered Institute of Plumbing and Heating Engineering	Hot Water Heat Pump CAHV-P500YA-HPB	Mitsubishi Electric Europe B.V. and Mitsubishi Electric Air Conditioning & Refrigeration System Works



Environment – Initiatives toward Creating a Low-Carbon Society

▣ Reducing CO2 from Product Usage

Introducing objectives and results of fiscal 2013 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 per unit of sales index target, fiscal 2013 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 2013.

▣ Reducing CO2 from Logistics

Overview of the Mitsubishi Electric Group's fiscal 2013 achievements in reducing CO2 emissions through just-in-time improvements to boost logistics efficiency.

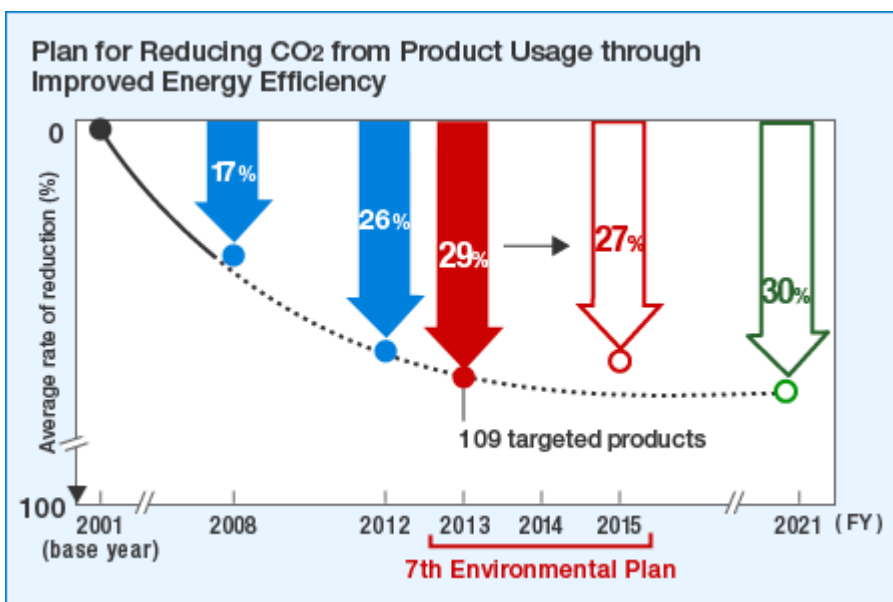
Targets of the 7th Environmental Plan (Fiscal 2013 to 2015) and Fiscal 2013 Progress

Reducing CO2 from Product Usage		
Targets of the 7th Environmental Plan (fiscal 2013-2015)	Progress in fiscal 2013	Self-evaluation
Reduction in CO2 from product usage through improved product performance: Average 27% reduction across 84 products	Achieved 29% reduction across 109 products	

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 that accompanies use of the products. The Mitsubishi Electric Group has identified products to be developed under target values for reduced power consumption, and is aiming for a 27% average reduction compared with fiscal 2001 across 84 products under the 7th Environmental Plan (fiscal 2013-2015).

In fiscal 2013, we expanded the number of these targeted products to 109 and achieved a 29% average reduction, surpassing the target that we had set for the final year of the Plan. We owe this achievement to having improved the CO2 reduction in almost every product. Areas that contributed to the improvement in average reduction rate, with each area's year-on-year reduction rate shown in parentheses, included intelligent transport systems (ITS) (49%), mobile communications base stations (23%), backbone optical transmission systems (19%), various types of TFT LCD modules (19%) and standardized elevators (16%). In fiscal 2014, we will continue our efforts to develop high-efficiency products to maintain and improve this reduction rate.



[Environmental Report 2013: Highlights of Activities in Fiscal 2013](#) →

[The Environment and Business](#) →



Environment – Expanding Our Contributions to Reducing CO2 from Product Usage

Contributions to Reducing 49.03 Million Tons of CO2 for 134 Products Worldwide

In our 7th Environmental Plan covering fiscal 2013 to 2015, Mitsubishi Electric set a goal of expanding the 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). Increasing our contributions toward this reduction means improving the energy efficiency of each product and expanding the scope of its sales. We seek to understand both the amount of CO2 emissions that accompany the use of our products and the amount by which we contribute to reducing those emissions.

Our contributions to reducing CO2 from product usage in fiscal 2013 stood at 49.03 million tons across 134 products. Total CO2 emissions from product usage were 120.34 million tons.

Breakdown of Targeted Products



The Mitsubishi Electric Group has approximately 260 products overall. We are working to measure the CO2 emissions from the usage of our products as well as our contributions to reducing those emissions, and have so far assessed 134 products. As our method of calculation, we use official standards or calculation methods established by the industry when these are available; when they are not, we establish product usage scenarios on our own to derive the amount of our contributions.

Breakdown of Products with Assessed Amount of Contributions to Reducing CO2 from Product Usage (134 Products)


Product category	Examples of products	Details of our contributions to reducing CO2 from product usage
(1)	Air conditioners, TVs, refrigerators, electric power steering systems, train integrated management system (TIS), etc.	Contribution from reduced power consumption by the product itself
(2)	Power devices, etc.	Contribution from efficiency improvements in embedded products
(3)	Alternators, starters, etc.	Mass-proportionate contribution from fuel efficiency improvements in embedded products
(4)	PV systems, Lossnay system, etc.	Amount of electricity generated in excess of the energy used in generation; amount of energy potentially released during usage that is instead used via heat exchange
(5)	Equipment that supports energy savings (including demand monitoring systems); renewal (modernization) of elevators, etc.	Contribution from managed electricity consumption owing to the introduction of equipment that supports energy saving; contribution from upgrades to high-efficiency parts during renewals, etc.

(6)	Gas-insulated switchgear, etc.	Reduction in leaked SF6 gas (CO2 equivalent)
-----	--------------------------------	----------------------------------------------

Note: Total CO2 emissions from product usage are defined by the GHG Protocol international standard for calculating greenhouse gas emissions, and equate to greenhouse gas emissions (Scope 3, Category 11) owing to the usage of marketed products. For details, see references including "The Greenhouse Gas (GHG) Protocol: " (PDF, 238KB) from the Ministry of the Environment.

- [Environmental Report 2013: Highlights of Activities in Fiscal 2013](#)

- [The Environment and Business](#)


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

Reducing CO2 from Production					
Targets of the 7th Environmental Plan (fiscal 2013-2015)	Fiscal 2013			Fiscal 2014	Fiscal 2015
	Target	Performance	Self-evaluation	Target	Target
Year-on-year emissions per unit of sales: 83% compared with fiscal 2011 (-17%)	89%	96%		86%	83%

While the 6th Environmental Plan (fiscal 2010-2012) set a target of reducing the total absolute volume of CO₂, the 7th Environmental Plan (fiscal 2013-2015) uses a per unit of sales index as the target to be reached. The purpose of this is to properly evaluate our activities to reduce total CO₂ at times when production volume has risen or fallen.

Summary of Fiscal 2013

The 7th Environmental Plan calls for an improvement in CO₂ per unit of sales by fiscal 2015, cutting CO₂ to 83% of the fiscal 2011 level (a 17% reduction). Toward the achievement of that target, we have begun working to raise the efficiency and performance of air conditioning, lighting and other utility equipment, and to reduce CO₂ from production lines so as to visualize and eliminate hidden energy wastage in production processes. We are also undertaking activities to reduce CO₂ through demand management, and installing monitoring systems to manage and control electricity used during peak periods. At the same time, we continue to expand the installation of PV systems.

In fiscal 2013, the first year of the plan, we improved CO₂ emissions per unit of sales to 96%, falling short of the 89% target for the fiscal year. The main causes for this were sales declines in the Electronic Devices Business and the Industrial Automation Systems Business, and new plant construction in the Energy & Electric Systems Business.

In addition, although we envisioned a reduction of 121,000 tons of CO₂ over three years, we achieved a reduction of only 35,000 tons in the first fiscal year against a target of 39,000 tons for that year. One factor behind this result is a decline in our creation of new energy-saving measures, as well as the failure of energy conservation action plans to make sufficient headway under the impact of sales declines. At the same time, our total CO₂ in fiscal 2013 was 920,000 tons, below the 990,000 tons we had envisioned. Building on this result, in fiscal 2014 we plan to conduct activities that focus on heat energy as a promising solution for reducing CO₂, while also accelerating the sharing of energy-saving technology throughout the organization.

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

To achieve the 7th Environmental Plan's target of improving CO₂ emissions per unit of sales to 83% of the level of fiscal 2011, Mitsubishi Electric is working to reduce CO₂ from four perspectives.

1. Reducing CO₂ from Production Lines

Against a plan to reduce CO₂ by 48,000 tons over the three years of the 7th Environmental Plan, our performance in fiscal 2013 was a 15,000 ton reduction (7,000 tons at Mitsubishi Electric, 2,000 tons at affiliates in Japan, and 6,000 tons at overseas affiliates). We are continuing our efforts to visualize and eliminate hidden energy waste in production processes.

At each production line and facility at our sites, we have installed our own EcoMonitor and

EcoServer products that monitor energy consumption in real-time. This measure to improve production efficiency and conserve energy has allowed us to reduce CO₂. In fiscal 2014, we will focus on heat energy, a promising solution for reducing CO₂ emissions.

Looking at our affiliates in Japan, we have conducted energy conservation diagnostics at sites with high levels of emissions and have implemented measures to address points for improvement. In fiscal 2014, we will roll out new CO₂ reduction measures developed by Mitsubishi Electric.

At our overseas affiliates, we conducted energy conservation diagnostics and provided technical support at three companies in China and Thailand that had particularly high levels of emissions. In fiscal 2014, we will identify companies with rising levels of CO₂ emissions, conduct energy conservation diagnostics, and expand the scope of our activities to reduce CO₂.

2. Reducing CO₂ from Utilities

In fiscal 2013, we reduced CO₂ by 16,000 tons against a three-year target of 56,000 tons under the 7th Environmental Plan. Moving forward, we will continue our systematic installation of high-efficiency equipment, including upgraded air conditioning equipment and LED replacements for mercury-vapor lamps and office lighting.

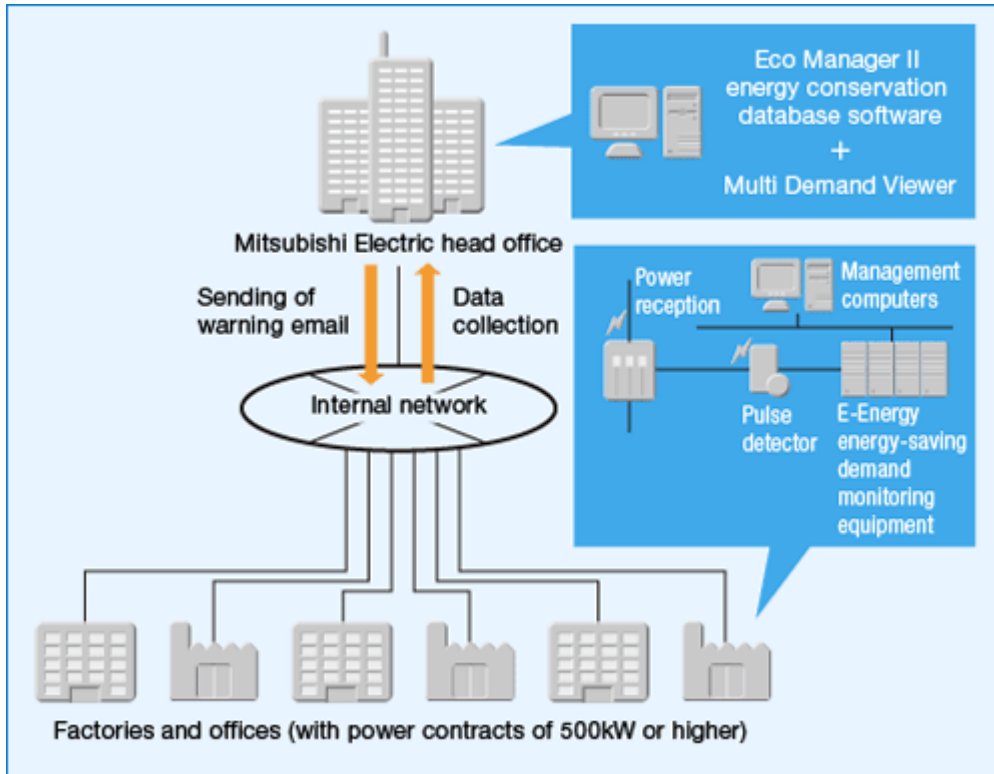
3. Reducing CO₂ through Demand Management

From fiscal 2012, we have worked to meet the government's call for conservation of electricity by rolling out our demand monitoring system that provides integrated management of power usage during peak periods. During fiscal 2013, we completed installation at all 68 Group sites* in Japan that have large power contracts (500kW or more). This system lets us perform wide-area electricity conservation management, to set optimal target values based on data analysis, and to share data. Under the 7th Environmental Plan, we will work to reduce CO₂ by 11,000 tons over three years through management of demand. We also plan to downsize our power contracts and reduce energy costs as our electricity conservation activities take root.

* These 68 sites with large power contracts account for 80% of the Mitsubishi Electric Group's total CO₂ emissions.

What Are Demand Monitoring Systems? What Are Their Merits?

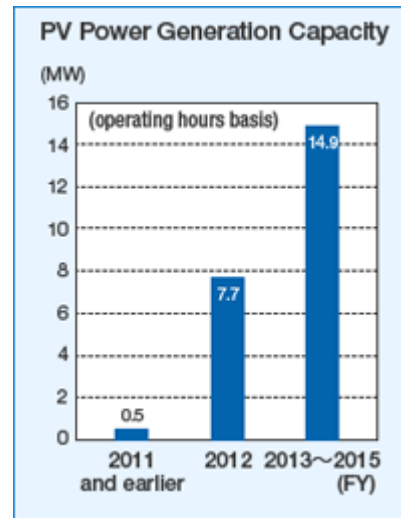
- "Peak demand" refers to power usage during peak periods. Controlling this demand reduces the amount of electricity that must be generated at the supply source. Demand monitoring systems enable focused monitoring and regulation of the demand from multiple users of power, and thus allow actions such as coordination of peak usage periods. In this way, the systems allow overall control of demand in a way not possible through control of individual users' demand.
- Real-time monitoring of power usage and PV system power generation.
- Automatic calculation and graphing of demand forecasts based on past usage.
- Site-specific demand, as well as grouping by power utility and by 60/50Hz specification.
- Automatic sending of email alerts when demand approaches target values.



4. Expanding the Installation of PV Systems

The Mitsubishi Electric Group seeks to reduce CO₂ by expanding our installation of PV systems. Power generation of our installed PV systems on an operating basis reached 7.7MW at the end of fiscal 2012. We have set a goal of securing a cumulative generation capacity of 14.9MW across the Mitsubishi Electric Group in Japan by the end of fiscal 2015. In fiscal 2013, we reduced CO₂ by 4,000 tons against a three-year target of 6,000 tons under the 7th Environmental Plan.

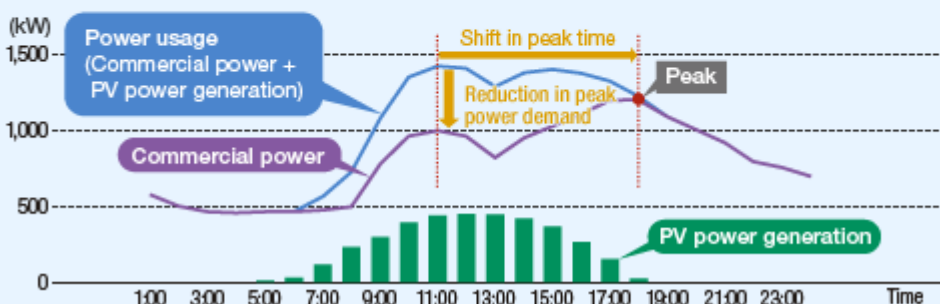
In fiscal 2014, we will install systems that enable real-time monitoring of power generation, assessing CO₂ reduction effects and using peak power forecasting features to enact optimal energy conservation activities.



Effects of Installing PV systems

The period from 11:00 to 14:00, when power demand peaks, is also the time in summer when the temperature rises and air conditioner use increases.

The period when the temperature rises coincides with the period of strongest sunlight. At sites where we have installed PV systems, the increase in generated power offsets the increase in consumption, shifting the peak period to a later time. This has enabled us to vary sites' demand peaks for easier regulation of power.



Main Sites of Installations in Fiscal 2012



Power Distribution Systems Center

The Center installed PV panels on the rooftop of a walkway extending from the factory to the cafeteria as a way to contribute to both reducing CO₂ and employees' comfort.

40kW system
(192 monocrystalline PV modules)



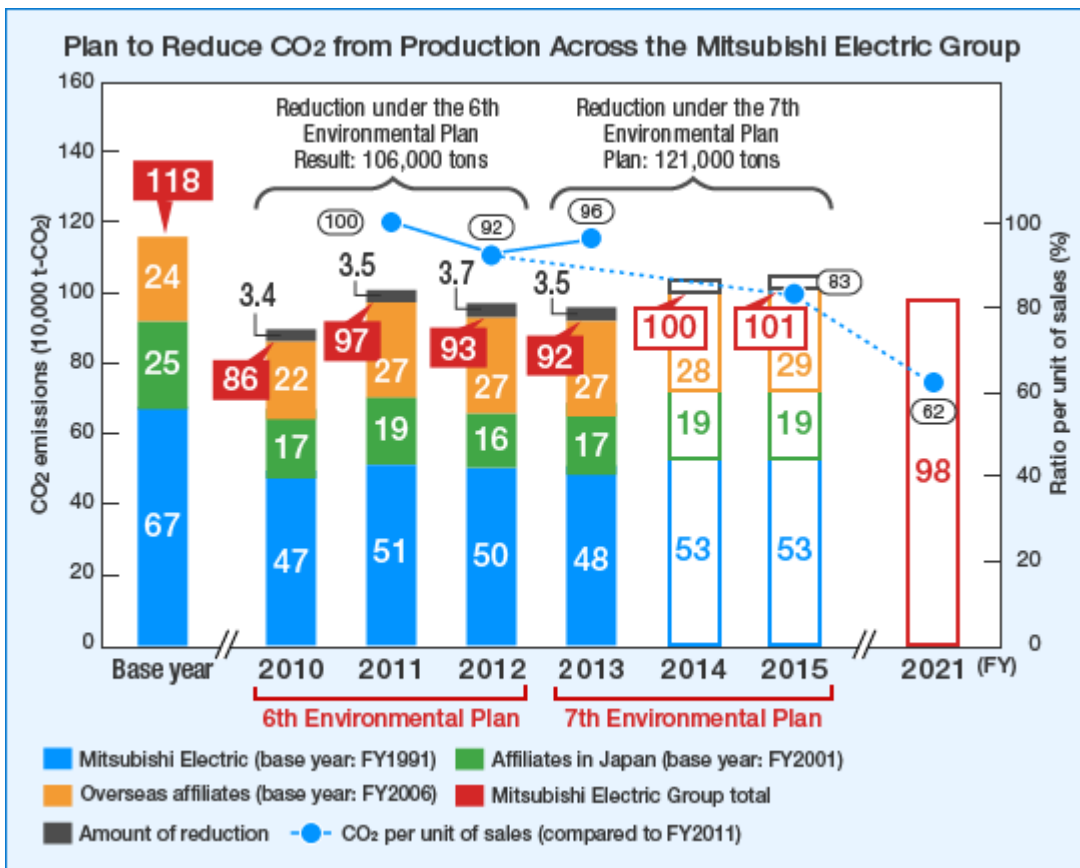
Iida Factory, Nakatsugawa Works

The Iida Factory increased its installation of PV equipment under the concept of creating its own "mega solar" (1MW) facility.

700kW system
(6,229 polycrystalline and monocrystalline PV modules)

Outlook for CO₂ from Production Across the Mitsubishi Electric Group

Connection with Reducing CO ₂ from Production (Environmental Vision 2021)			
Total CO ₂	Total CO ₂ envisioned for fiscal 2013 under the 7th Environmental Plan	Fiscal 2013	Self-evaluation
Group overall	990,000 tons	920,000 tons	😊
Mitsubishi Electric	490,000 tons	480,000 tons	😊
Affiliates in Japan	170,000 tons	170,000 tons	😊
Overseas affiliates	320,000 tons	270,000 tons	😊
Amount of reduction	CO ₂ envisioned for three years under the 7th Environmental Plan	Fiscal 2013	Self-evaluation
Group overall	121,000 tons (3 years)	35,000 tons (single fiscal year)	😐
Mitsubishi Electric	69,000 tons (3 years)	16,000 tons (single fiscal year)	😐
Affiliates in Japan	24,000 tons (3 years)	5,000 tons (single fiscal year)	😐
Overseas affiliates	28,000 tons (3 years)	14,000 tons (single fiscal year)	😊




Note: In the announcement of the fiscal 2013 7th Environmental Plan, Mitsubishi Electric changed emissions levels for the base year and for the target year (fiscal 2021).

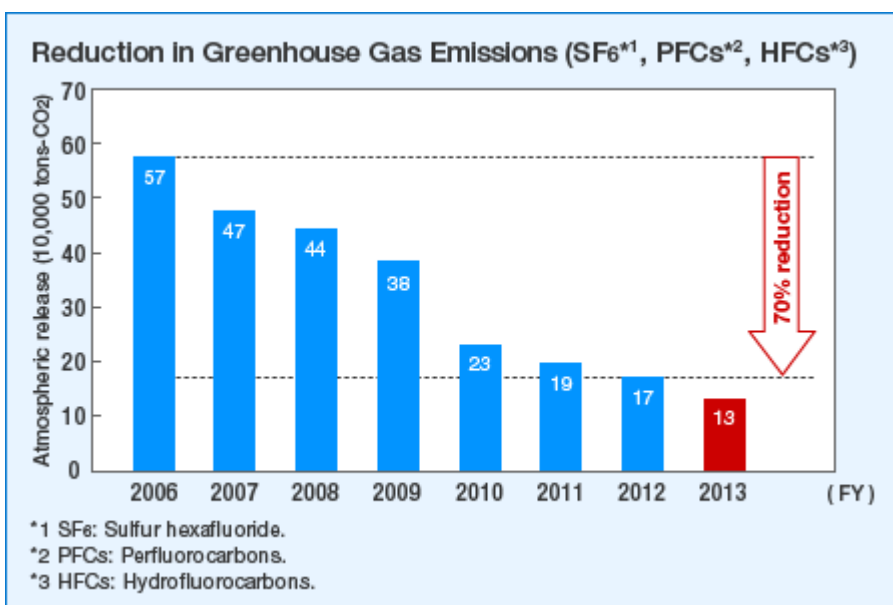
- Base year: Changed from 1,140,000 tons to 1,180,000 tons, reflecting the addition of results from three semiconductor production sites newly added to targeted sites.
- Fiscal 2021: Changed from 830,000 tons to 980,000 tons, reflecting a change in the domestic electricity emission coefficient forecast from 0.33 to 0.42. 830,000 tons represents a 30% reduction from the total emissions in the base year.

Environmental Report 2013: Highlights of Activities in Fiscal 2013 →

Environment – Reducing Emissions of Non-CO2 Greenhouse Gases

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

Reducing Emissions of Non-CO2 Greenhouse Gases		
Targets of the 7th Environmental Plan (fiscal 2013-2015)	Progress in fiscal 2013	Self-evaluation
Reduce CO2 equivalent of non-CO2 greenhouse gases (SF ₆ , PFC, HFC) by 70% compared with fiscal 2006	Achieved and maintained target in Japan	



Non-CO₂ greenhouse gases emitted by the Mitsubishi Electric Group during its business activities include SF₆ (sulfur hexafluoride, an electrical insulating gas used in gas-insulated switchgear), PFCs (perfluorocarbons, used as an etching gas for production of semiconductors and liquid crystals), and HFCs (hydrofluorocarbons, 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, 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

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

* Value for CO₂ = 1.

Achievements for Fiscal 2013

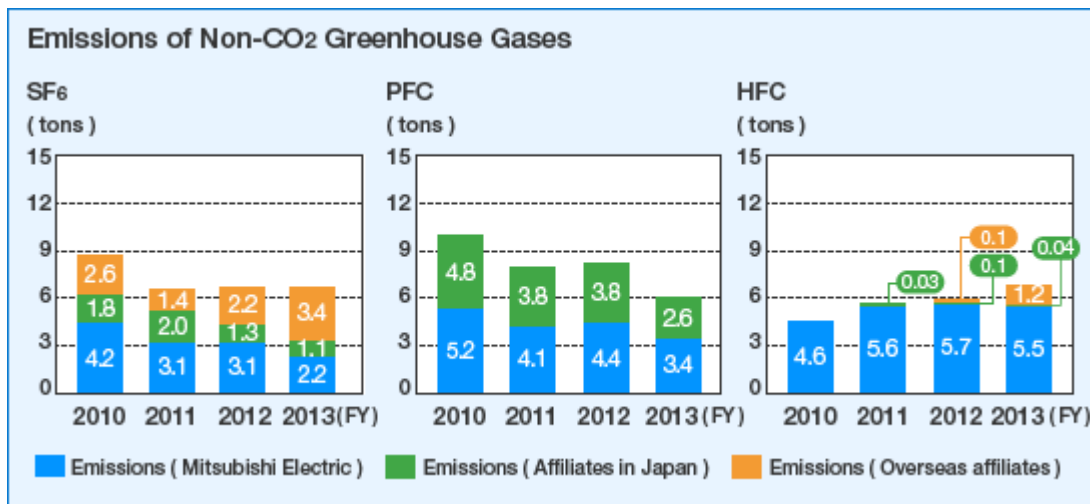
For Mitsubishi Electric and our affiliates in Japan, the 7th Environmental Plan sets a target of reducing greenhouse gases by 70% compared with fiscal 2006. We achieved this target in fiscal 2012, and in fiscal 2013 further improved our reduction to 87%. Moving forward, we will firmly establish the measures that we have implemented so far and will undertake actions for medium- to long-term reductions as well, through means such as rolling out additional collection equipment.

Our SF₆ emissions in fiscal 2013 were 79,000 tons-CO₂, the result of initiatives to improve the capacity of gas collection equipment, perform everyday monitoring of leakage and enhance collection.

Emissions of PFCs were 41,000 tons-CO₂ as we phased in gas removal equipment and continued our switch to gases with a lower global-warming potential.

Emissions of HFCs were 9,000 tons-CO₂, the result of initiatives including the installation of equipment for rendering gases harmless.

At our overseas affiliates, we continued initiatives that include switching to gases with lower global-warming potential, upgrading to stainless steel pipes with low leakage and installation of leak detectors. We will achieve further reductions overseas by extending the gas collection enhancements, promoting alternatives and taking other measures that have been successful in Japan.



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 2013 Achievements of the Mitsubishi Electric Group

(Mitsubishi Electric and affiliates in Japan)

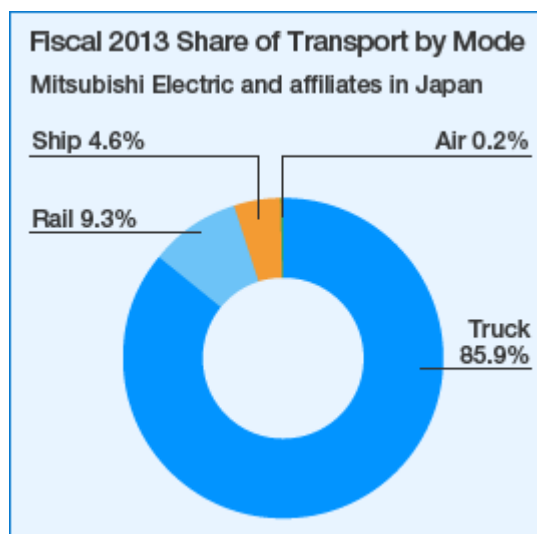
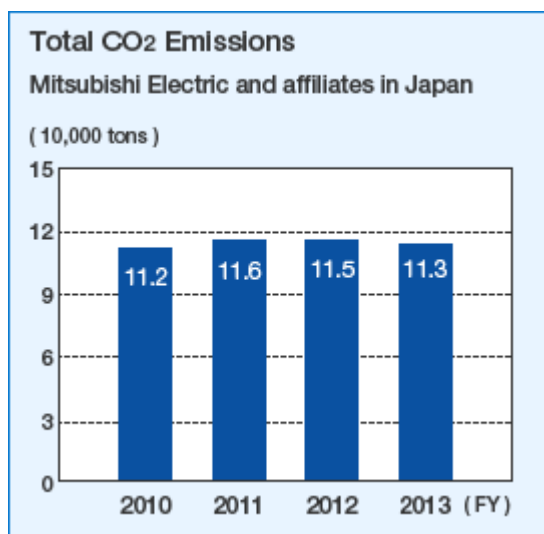
**Result: CO2 emissions in fiscal 2013: 113,000 tons
2,000-ton (2.4%) year-on-year reduction**

In fiscal 2013, Mitsubishi Electric and its affiliates in Japan carried forward measures from the previous year, including the following.

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

Due to a higher number of individual deliveries in fiscal 2013, Mitsubishi Electric's CO2 emissions were 95,000 tons, representing a year-on-year increase of 2,000 tons, or 2.4%. Emissions from our affiliates in Japan were 18,000 tons, for a year-on-year decrease of 4,000 tons, or 18.1%.

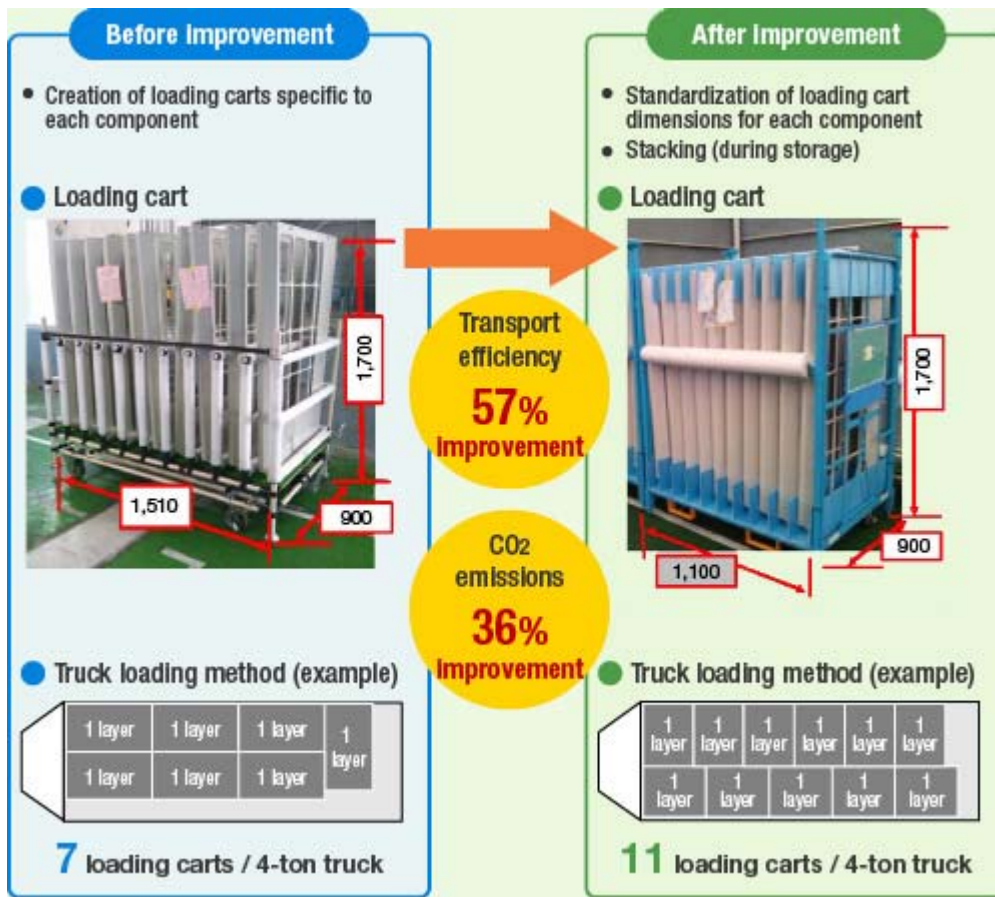
The number of overseas affiliates for which we collected data in fiscal 2013 was 22, the same as in the previous year. CO2 emissions by overseas affiliates were 247,000 tons, an increase of 27,000 tons over the previous year's 220,000 tons owing to an increase in international transport.



Reducing CO2 from Logistics by Improving Packing

The Mitsubishi Electric Group has focused on the packing of procured materials as a way to reduce the number of trucks we use. One example is our improvement of logistics for procured components at the Air-Conditioning & Refrigeration Systems Works. We set the size of the loading carts used for transporting and storing components to 1/N the size of the truck beds, improving transport efficiency by 57% and improving storage efficiency at the same time.

The result of this initiative has been a reduction of up to 36% in CO2 from logistics.



Environment – Initiatives toward Creating a Recycling-Based Society

Reducing Resource Inputs

Introducing objectives and results of fiscal 2013 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 2013 achievements.

Initiatives toward Zero Final Waste Disposal Ratio

Priority measures of efficient resource usage and the target for final waste disposal ratio, and fiscal 2013 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 2013 initiatives and achievements.

Using Water Effectively

Our views on the effective use of water, and the Mitsubishi Electric Group's achievements in fiscal 2013.

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

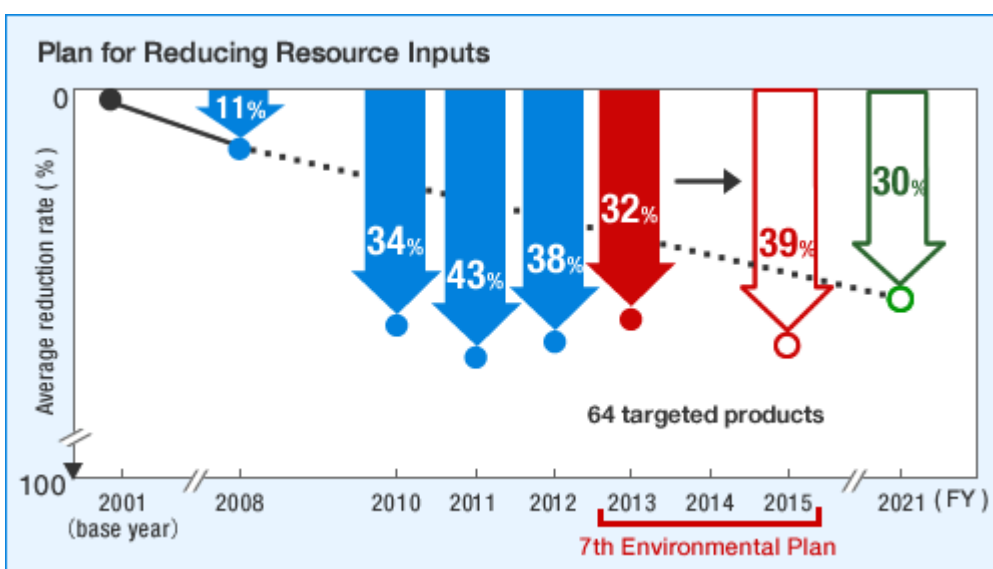
Reducing Resource Inputs		
Targets of the 7th Environmental Plan (fiscal 2013 to 2015)	Progress in fiscal 2013	Self-evaluation
Average reduction rate for 64 products: 39% (compared with fiscal 2001)	Average reduction rate for 64 products: 32% (compared with fiscal 2001)	

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 inputs 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 inputs for 64 targeted products 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 2013 we achieved an average 32% reduction rate for the 64 targeted products. Although improvement in the reduction rate has slowed for two years straight, reduction in resource inputs for individual products has proceeded steadily. The worsening of the index is due to contracting sales of LCD televisions that had buoyed the improvement rate, and increased sales of products for which structural strength requirements offer little opportunity for resource reduction. 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 continue our reduction initiatives.

Products Making Notable Year-on-Year Progress in Resource Reduction in Fiscal 2013

- Mobile communications base stations: 78% reduction rate improvement
- TFT LCD modules: 13% reduction rate improvement
- Backbone optical transmission systems: 11% reduction rate improvement
- Automatic platform gates: 10% reduction rate improvement
- RFID reader/writers for radio frequency communication: 10% reduction rate improvement



Recycling Four Kinds of Home Appliances

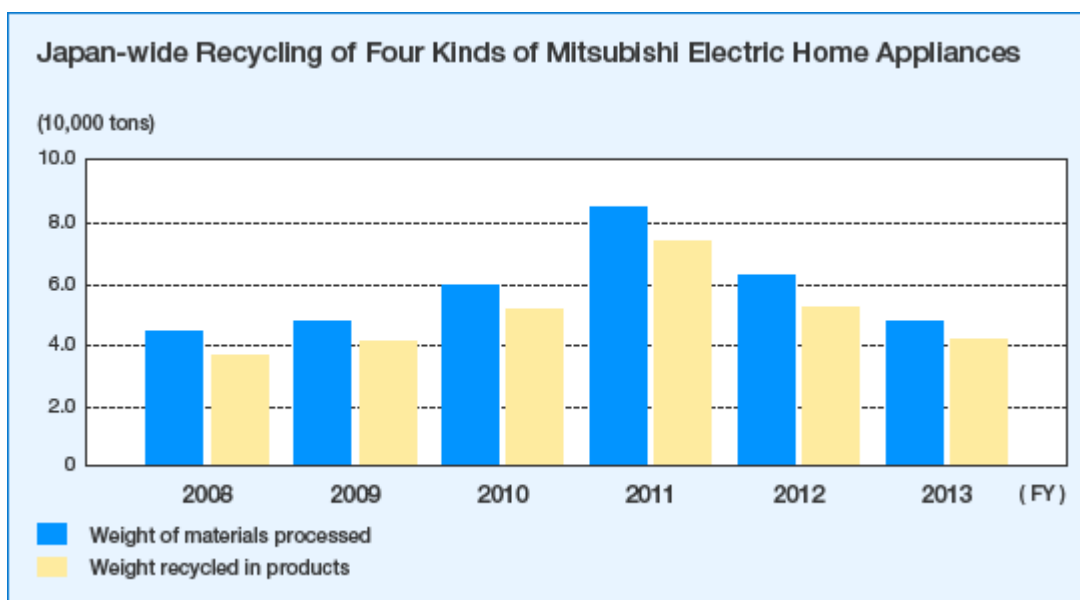
Japan's Home Appliances Recycling Law* makes the collection and recycling of four kinds of appliances mandatory: air conditioners, television sets, (CRT, LCD and plasma models), refrigerators/freezers and washing machines/tumble dryers.

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 2013, HCS had recycled 580,000 tons of material. The results for the collection and recycling of four kinds of Mitsubishi Electric home appliances in fiscal 2013 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 like 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 2013)

	Unit	Air Conditioners	Television Sets		Refrigerators / Freezers	Washing Machines / Tumble Dryers	Total
			CRT	LCD / Plasma			
Recovered units at collection points	1,000 units	330	174	10	338	213	1,067

Treated units	1,000 units	331	187	10	338	215	1,083
Treated weight	Tons	13,624	4,894	192	21,403	7,555	47,671
Recycled weight	Tons	12,796	4,012	172	17,429	7,033	41,444
Recycled ratio (sold material ratio)	%	93	81	89	81	93	86

Recycling Personal Computers

Mitsubishi Electric promotes the recycling of used computers and monitors. In fiscal 2013, we collected a total of 4,625 household- and industrial-use computers, which represented a recycling rate of 78.3%.

For end-of-life household-use computer equipment we have implemented a plan of marking used computers with a PC Recycle Mark¹ 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 Internet². When we receive a disposal request for a product sold from 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 2013)

	Unit	Desktop		Notebooks		CRT Displays		LCD		Total	
		Office	Home	Office	Home	Office	Home	Office	Home	Office	Home
Collected weight	Tons	19.0		1.7		11.1		8.7		40.5	
		17.5	1.5	1.6	0.1	9.1	2.0	8.3	0.4	36.5	4.0
		1,958		704		538		1,425		4,625	
Collected units	Units	Office	Home	Office	Home	Office	Home	Office	Home	Office	Home
		1,838	120	661	43	437	101	1,366	59	4,302	323
		19.0		1.7		11.1		8.7		40.5	
Treated weight	Tons	19.0		1.7		11.1		8.7		40.5	
Recycled weight	Tons	15.8		1.3		7.1		7.5		31.7	
Recycling ratio	%	83.0%		77.6%		63.9%		86.4%		78.3%	

* Including all-in-one computers.

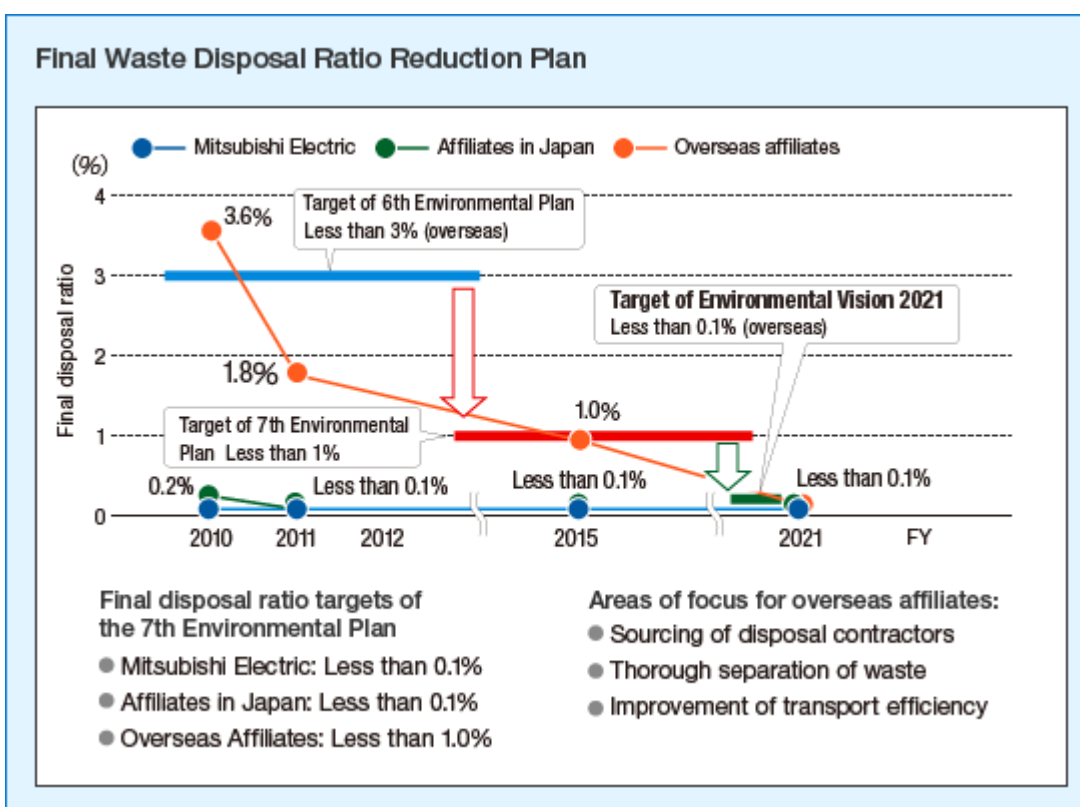
Environment – Initiatives toward Zero Final Waste Disposal Ratio

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

Final disposal ratio			
Target of 7th Environmental Plan (fiscal 2013–2015)		Progress in fiscal 2013	Self-evaluation
Mitsubishi Electric	Less than 0.1%	0.002%	😊
Affiliates in Japan	Less than 0.1%	0.08%	😊
Overseas affiliates	Less than 1.0%	1.55%	😊

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 2014, we will continue to sustain the target of under 0.1% that we have achieved, through initiatives such as improving the transport efficiency of waste.

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 will work to thoroughly analyze and separate waste at these affiliates while also sourcing recycling contractors.



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

1. Thorough Analysis and Separation of Waste

By conducting analysis of waste that can be converted to saleable materials at our sites, we are able to more thoroughly conduct separation and conversion.

2. Sourcing of Disposal Contractors

By sharing information about waste disposal contractors among Mitsubishi Electric and its affiliates in Japan, we will continually promote and achieve a higher level of conversion to saleable materials.

At our overseas affiliates, we are promoting the conversion to saleable materials through thorough separation, and are working to collect information to aid in sourcing waste disposal contractors.

3. Improvement of Transport Efficiency

Mitsubishi Electric and our affiliates in Japan are building waste and recycling logistics systems that eliminate wastefulness.

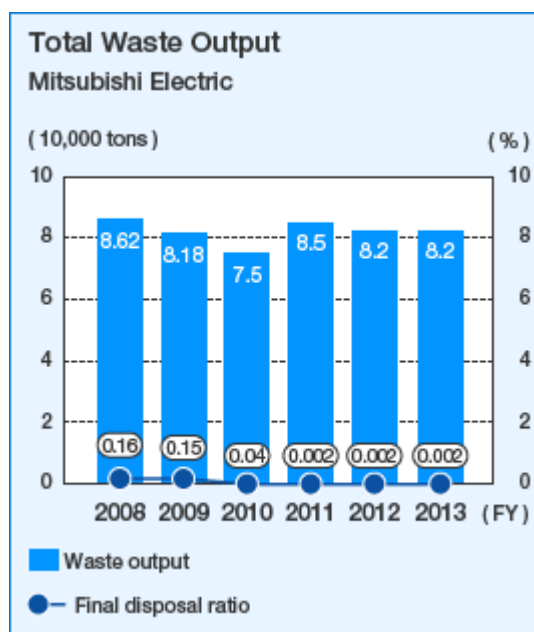
Mitsubishi Electric's Targets and Fiscal 2013 Achievements

Sustaining the Previous Fiscal Year's 0.002% Final Waste Disposal Ratio

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, our total waste emissions in fiscal 2013 were 82,000 tons (a 0.4% decline from fiscal 2012) and our final disposal ratio was 0.002%.

Moreover, Mitsubishi Electric introduced electronic manifestos at 21 out of our 25 sites, with introduction scheduled at the remaining four sites in fiscal 2014.



Targets and Fiscal 2013 Achievements for Affiliates in Japan

Final Disposal Ratio Increased 0.06% Year-on-Year but the 7th Environmental Plan Target of Less than 0.1% Was Achieved

Looking at our affiliates in Japan in fiscal 2013, factors including an increase in waste containing asbestos from discontinued facilities and a decrease in production resulted in final waste disposal of 60,000 tons and a final disposal ratio of 0.08%, a 0.06-point increase from 0.02% ratio on fiscal 2012.

In coordination with Mitsubishi Electric's waste management initiatives, we will work to share expertise and information, raise the level of waste separation and promote conversion to saleable materials at our affiliates.

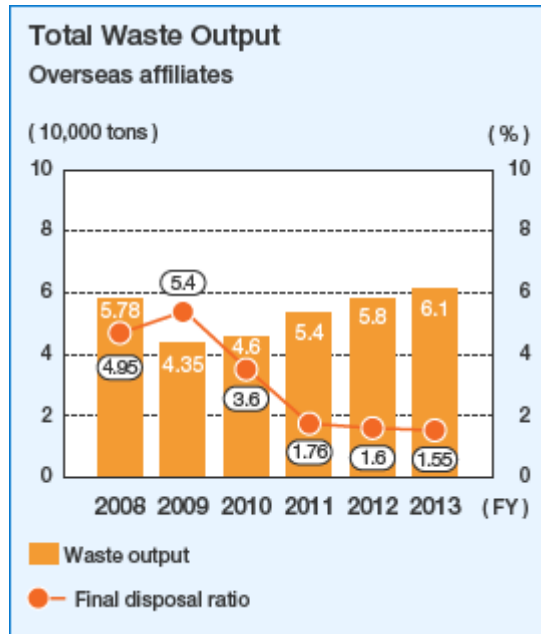


Targets and Fiscal 2013 Achievements for Overseas Affiliates

With a Final Disposal Ratio of 1.55%, We Are Moving Steadily Toward the 7th Environmental Plan Target of Less Than 1.0%

For our overseas affiliates in fiscal 2013, final waste disposal was 61,000 tons with a final disposal ratio of 1.55%, a 0.05% improvement from 1.60% in fiscal 2012.

As laws, regulations and waste treatment conditions differ among countries and regions, Mitsubishi Electric develops necessary measures for overseas affiliates through its patrol activities. To promote the conversion of waste to saleable materials, a necessary component in reducing final waste, we will share information on best practices, waste separation and collection methods, and waste disposal contractors among our overseas affiliates as we take further steps to source waste disposal contractors.





Environment – Reducing the Use of Disposable Packaging Materials

Mitsubishi Electric Group's Fiscal 2013 Achievements

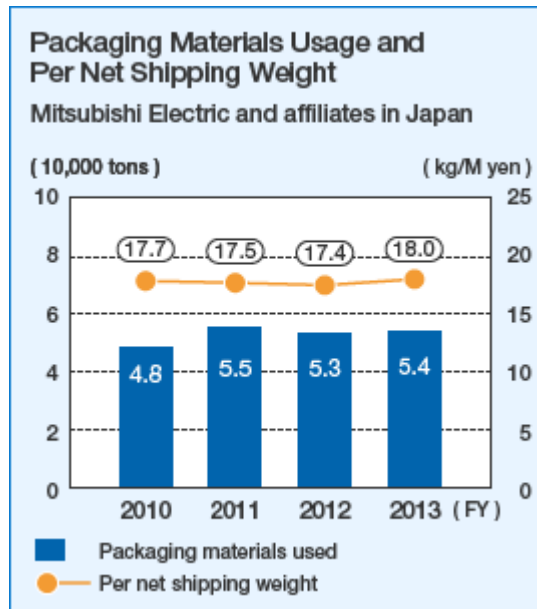
The Mitsubishi Electric Group is improving its logistics work as a part of its just-in-time improvement activities. In this area, we have set a basic principle of reducing the weight of the transport packaging while ensuring safe delivery of our products to customers. Under this concept, we are advancing 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 of shipment: 18.0 kg/one million yen (3.0% year-on-year increase)
- Volume of packaging used: 54,000 tons (1,000-ton year-on-year increase)

The main cause of the increase for Mitsubishi Electric and affiliates in Japan was an increase in materials for overseas production, of which packaging comprises a high proportion compared to volume of shipment. We will work further to make our packaging more compact and simple.

In our overseas affiliates, the use of packaging materials by 21 companies totaled 32,000 tons.



Reducing Disposable Packaging Material by Improving Logistics in Cooperation with Product Design Divisions

To reduce the amount of packaging materials that are disposed of as waste, the Mitsubishi Electric Group has focused on making packaging materials used in transport more compact. One example can be seen in the improvement of packaging for LCD televisions by our Kyoto Works, which worked with product design divisions to promote logistics improvements. Changing the packaging structure to allow folding of the Blu-ray disk unit during transport enabled a 50% reduction in packaging volume as well as lower transport costs.

Such initiatives allowed us to cut the volume of the product's packaging material waste by 44%.

Before Improvement

Product box required a depth dimension to accommodate the Blu-ray disk unit



● Product box



- Amount of cardboard and expanded polystyrene used: **3,909g**
- Volume: **0.379m³**

Volume reduced

50%

Packaging materials reduced

44%

After Improvement

Folding the Blu-ray unit at the rear of the LCD television during transport allows smaller depth dimension in the product box



● Product box



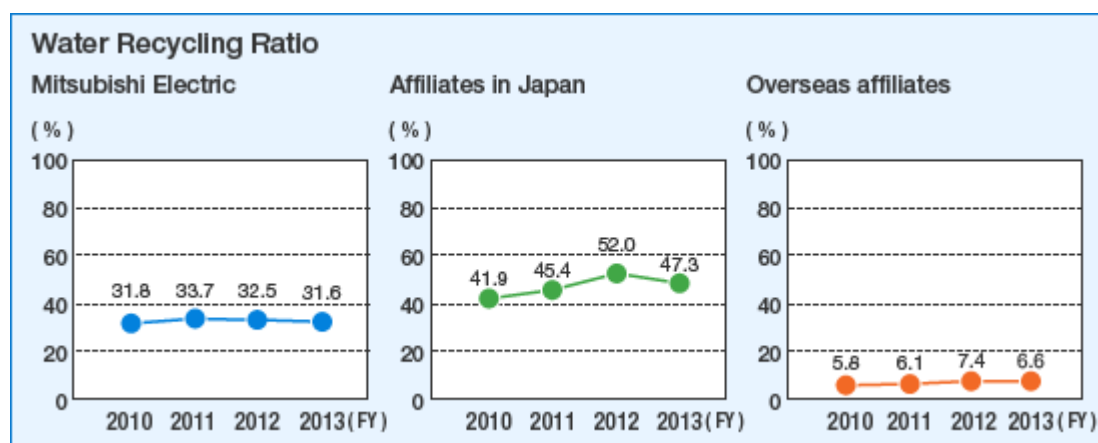
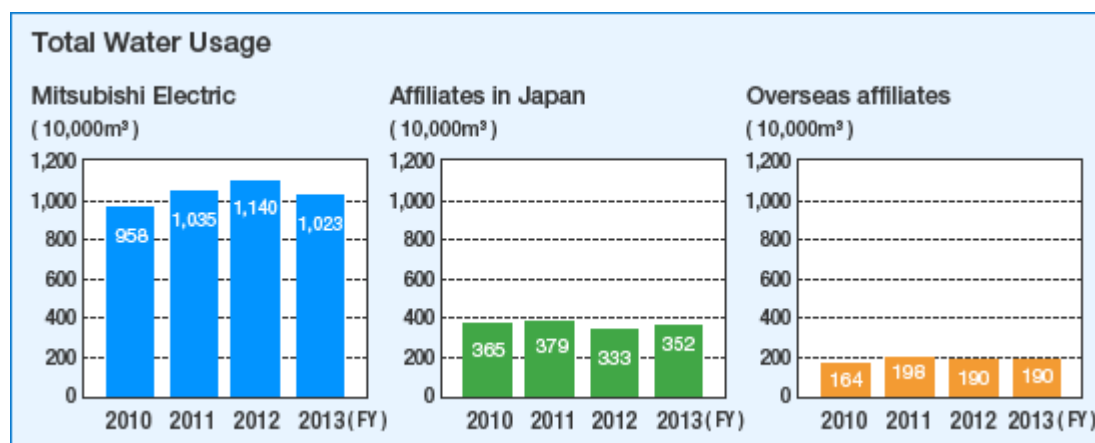
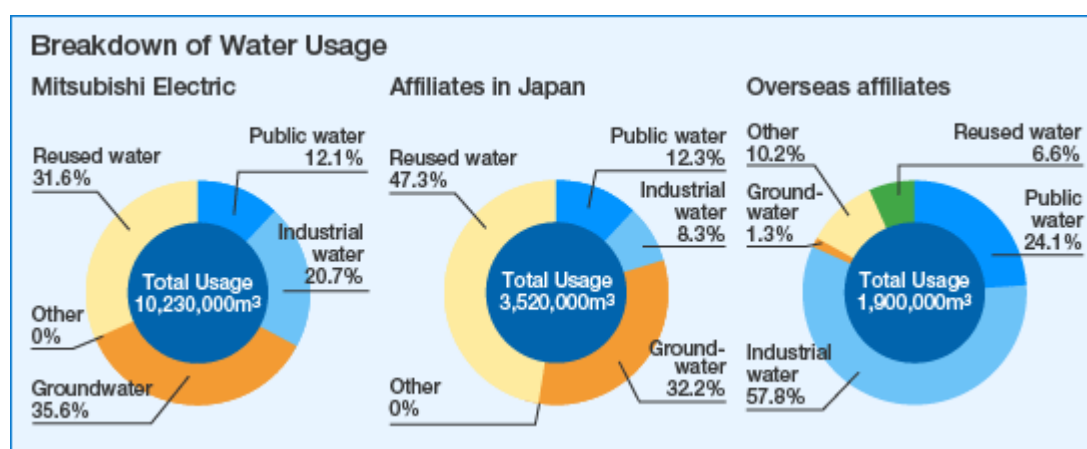
- Amount of cardboard and expanded polystyrene used: **2,168g**
- Volume: **0.184m³**

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 2013, Mitsubishi Electric used a total of 10.23 million m³ of water, a 5.0% decrease over the 10.80 million m³ amount used in fiscal 2012. The total volume of water used at our affiliates in Japan was 3.52 million m³, a 6% increase year-on-year compared to 3.33 million m³ seen in fiscal 2012. The volume of water used at our overseas affiliates totaled 1.90 million m³, the same as in the previous year.

Our water recycling ratio was 32.0% for Mitsubishi Electric, 47.0% for affiliates in Japan and 6.6% for overseas affiliates.



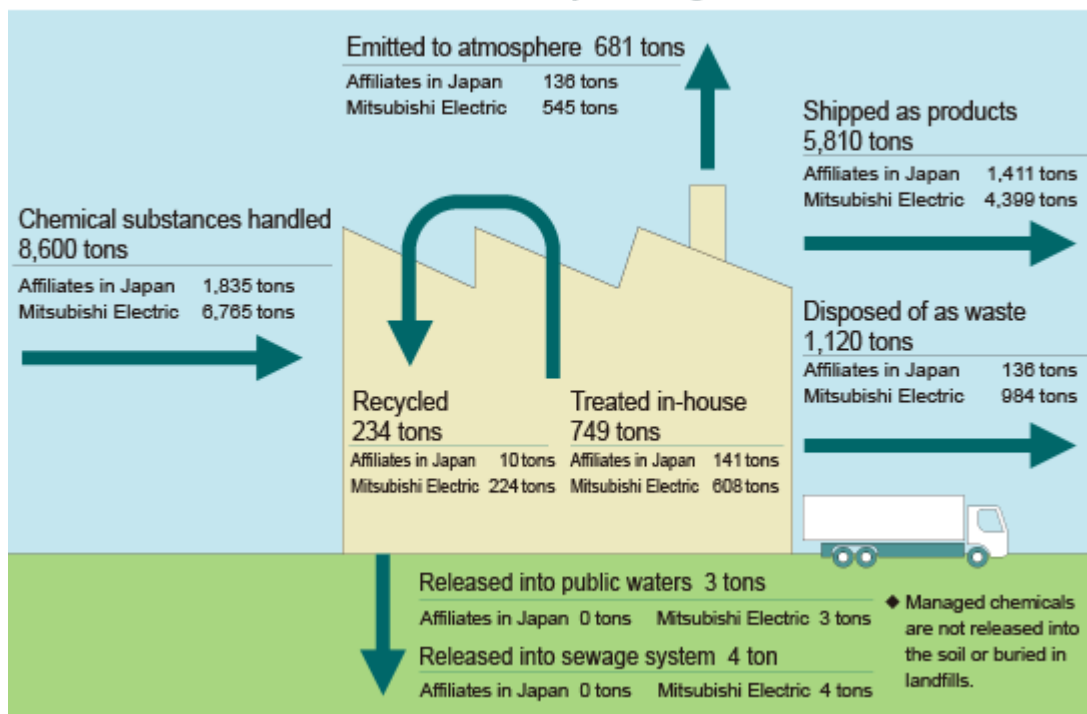
Managing Controlled Chemical Substances using Our Own Chemical Substance Management System

Mitsubishi Electric and its affiliates in Japan have been managing chemical substances on a voluntary basis since 1997. These include refrigerant fluorocarbons (HFCs¹ and HCFCs²) used in air conditioners and refrigerators, volatile organic compounds (VOCs), and the six RoHS substances. Combined with the 462 substances designated under the PRTR Law³ (PRTR⁴) revised in November 2009, the above comprise a current list of 2,615 substances we voluntarily manage under our comprehensive Chemical Substance Management System that encompasses purchasing information about materials and components.

In fiscal 2013, Mitsubishi Electric used 137 different chemicals totaling 6,785.6 tons (fiscal 2012: 142 substances, 6,934 tons), while affiliates in Japan used 48 substances totaling 1,835 tons (fiscal 2012: 49 substances, 1,717 tons). 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. Going forward, we will continue to assess and manage our use of these substances as well as make every effort to eliminate waste.

- 1 HFC: hydrofluorocarbon.
- 2 HCFC: hydrochlorofluorocarbon.
- 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.

Material Balance of Chemical Substances Subject to Regulation



2013)

Mitsubishi Electric (Unit: tons)

Rank	Substance	Amount handled (tons)	Amount released /transferred (tons)	Amount eliminated /recycled (tons)	Amount consumed (tons)
1	Lead	1,017	66	6	945
2	Bis(4-isocyanatophenyl) methane	690	683	7	0
3	Isopropyl alcohol	388	223	143	21
4	Styrene	276	127	0	149
5	Hydrogen fluoride and other water soluble salts	161	24	201	0
6	Xylene	137	85	47	6
7	Butyl acetate	110	107	0	2
8	Antimony and antimony compounds	109	7	2	100
9	Tetrahydromethylphthalic anhydride	92	4	2	86
10	Toluene	81	52	21	9

Affiliates in Japan (Unit: tons)

Rank	Substance	Amount handled (tons)	Amount released /transferred (tons)	Amount eliminated /recycled (tons)	Amount consumed (tons)
1	Styrene	654	7	27	620
2	Methanol	160	21	40	99
3	Toluene	158	68	28	63
4	Maleic anhydride	117	0	9	107
5	Xylene	92	48	4	40
6	Methyl cyclohexene-dicarboxylic anhydride	82	1	0	81
7	Isopropyl alcohol	67	47	9	11
8	Phenol	51	5	0	46
9	Acetone	46	10	14	22
10	Ethylbenzene	43	11	1	30

Environment – Environment-Related Business and Environmental Technology Development

Environment-Related Business

Overview of the Mitsubishi Electric Group initiatives that contribute to the realization of a low-carbon society by positioning the environment-related business as a pillar for growth and providing various energy-saving products.

Environmental Technology R&D Results

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

Expanding All Products and Services that Contribute to the Environment

As a global leading green company, the Mitsubishi Electric Group is helping to build a more affluent society by providing products that are highly recognized by society for their contributions to the environment. To this end, we have positioned products related to smart grids and smart communities, SiC power devices and EV/HEV automotive equipment, and all other products and services as key products that will help us achieve a low-carbon and recycling-based society. At the same time, we will expand environment-related businesses globally through close-knit collaboration involving manufacturing and sales departments, business segments, as well as operating divisions and the corporate head office.

Creating Products with Highly Innovative Environmental Performance Features

The Mitsubishi Electric Group aims to increase the level of environmental consideration in all the products developed through Design for Environment activities by accelerating the development of fundamental technologies, key parts and manufacturing technologies related to energy conservation, size and weight reduction, rare metals and hazardous substance reduction.

The 7th Environmental Plan (fiscal 2013-2015) stipulates as a target that each business unit creates one or more products with highly innovative environmental performance features by fiscal 2015.

The Mitsubishi Electric Group conducts environmental technology related research and development with the aim of providing products and services that will help protect the environment. The results of R&D in fiscal 2013 are as follows.

Recycling Business
Smart Technology
Next-Generation Power Semiconductors
Environmental Products & Services
Supporting Customers in Energy Conservation

Recycling Business

Developed New Technology to Increase the Efficiency of Plastic Recycling

The Mitsubishi Electric Group has focused on large-scale and high-purity plastic recycling since fiscal 2011. In February 2013, we announced the development of a new technology for high-purity plastic recycling that increases efficiency. Jointly developed with Shimadzu Corporation, this technology can identify types of plastic with an accuracy of 99%, irrespective of pigmentation or additives. Using this technology, we will further increase the volume of plastic in closed-loop recycling.

Environmental Topics: Plastic Recycling Comes of Age 

Smart Technology

Launched Trials for Utilizing PV Systems and the Storage Cells of Electric Vehicles in a Smart Grid

Mitsubishi Electric commenced trials to utilize PV systems and the storage cells of electric vehicles (EVs) in a smart grid. In addition to advancing demonstration experiments that use EV storage cells to optimize power use at factories since April 2012, we commenced the verification of a new system incorporating PV and EV storage cells in a smart grid-compliant HEMS* at the Ofuna Smart House in Kamakura City, Kanagawa Prefecture beginning in May 2012.

* Home Energy Management System

Next-Generation Power Semiconductors

Verified Operation of an All-SiC Power Semiconductor Module with the World's Largest Capacity

Mitsubishi Electric has developed large-capacity silicon carbide (SiC) power module technologies incorporating all-SiC power devices. The new technologies, which have been incorporated in a prototype module, demonstrated operation at an unprecedented (according to Mitsubishi Electric's research as of February 14, 2013) 1,200 volts and 1,200 amperes. Power loss is approximately 75% lower than when Si is used, enabling this technology to contribute significantly to equipment size/weight reductions.

News Release

Feb 14, 2013

Mitsubishi Electric Develops Large-capacity SiC Power Module Technologies

Developed Machining Technology to Popularize SiC Power Devices

Mitsubishi Electric developed a new multi-wire electrical discharge slicing technology for silicon carbide (SiC) in February 2013. The technology uses a superfine electrode to cut semiconductor wafers and is expected to improve both the productivity of SiC slicing and the effective use of SiC material over typical methods using a blade. The fact that the price of SiC is higher than silicon (Si)

is considered to be an obstacle to its adoption, but such cost reduction technologies will boost its popularity going forward.

News Release

Feb 6, 2013

Mitsubishi Electric Develops Multi-wire Electrical Discharge Slicing Technology for Silicon Carbide (SiC) Ingot Processing

Released Two Types of SiC-Based Products for Rolling Stock

In September 2012, we concluded demonstration testing on a main circuit system for rolling stock that uses silicon carbide (SiC). Having confirmed a 38.6% reduction in power consumption compared to existing systems, this product was officially launched in November. In addition, a new auxiliary power apparatus for rolling stock that also uses SiC has been developed, which offers a 30% reduction in power loss, and approximate 20% and 15% reductions in volume and weight, respectively, in comparison to existing products.

News Release

March 26, 2013

Mitsubishi Electric Delivers World's First SiC Auxiliary Power Supply Systems for Railcars

Achieved the World's Highest Power Conversion Efficiency in a GaN Power Amplifier for Mobile Phones

In June 2012, Mitsubishi Electric newly developed a high-output, high-efficiency GaN power amplifier for mobile communications. Through optimization of the amplifier circuit, this product achieved a power conversion efficiency of 70% at an output of 170W, which is 12% higher than existing products. This unprecedented conversion efficiency is expected to lead to the development of smaller and more power-efficient base station transmitters.

News Release

June 20, 2012

Mitsubishi Electric Develops High-output, High-efficiency GaN Power Amplifier on Si Substrate for Mobile Communications Base Stations

Environmental Products & Services

Developed New PV Inverter Enabling High-Efficiency Solar Power Generation in Apartment Buildings

In July 2012, Mitsubishi Electric launched a new PV inverter for solar power generation that can be fitted on the outer walls of apartment buildings and other places. Mitsubishi Electric's own gradational control inverter system achieves a power conversion efficiency of 96.5% and also realizes the high water-proofing and dust-proofing performance essential for outdoor installations.

Released Large-Current Circuit Breaker that Eliminates SF₆ Gas and Reduces Maintenance Work

In December 2012, Mitsubishi Electric released a new large-current circuit breaker for installation in transformer substations operated by power companies and railroads. A composite insulation technology combining low-pressure dry air insulation and solid insulation completely eliminates the use of SF₆ (Sulfur hexafluoride) gas, rendering gas management unnecessary. In turn, this product dramatically reduces the amount and frequency of maintenance work required.

Supporting Customers in Energy Conservation

Launched New Service to Assist in Conservation of Electricity and Reduction in Peak Demand

In May 2012, Mitsubishi Electric added an optional service enabling a more flexible response to electricity conservation with its Facima Support Contract Lite, which supports measures to conserve electricity and reduce peak demand in small-scale buildings with no facility manager. Furthermore, we are further promoting services to support the conservation of electricity with the launch of the custom-made Mitsubishi Electric elevator NEXCUBE in July, which demonstrates enhanced energy-conserving operation features.

■ Dialog with Stakeholders

An overview of Mitsubishi Electric's dialog with a variety of stakeholders and experts.

■ Disclosure and Dissemination of Environmental Information

A look at the various communications published in fiscal 2013, 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 2013 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.

Every year, the Mitsubishi Electric Group engages with educational institutions and local residents through activities such as factory tours and environmental classrooms. We also hold dialog with various experts. Below is information on some of the dialog held to date.

Dialog on Energy Conservation Measures (held in April 2011)

In April 2011, we invited Professor Yoshihiko Takamura of Tokyo Denki University, who is well-versed in current energy conservation issues facing Japanese industry, to participate in a dialog on environmental management. We invited Mr. Takamura because we believed it was important to ask one of Japan's foremost experts in energy conservation research to assess the effectiveness and adequacy of our conservation efforts.



Environmental Topics: Dialog on Environmental Management →

Dialog on Biodiversity (held in March 2010)

In March 2010, we invited Ryo Kosaka, former Associate Professor at Nagoya City University who served as Advisor to the Executive Committee of the 10th Conference of the Parties to the Convention on Biological Diversity (COP10), to share his views on biodiversity. We invited Mr. Kosaka to ask for his advice on the Mitsubishi Electric Group Biodiversity Action Guidelines that was being formulated as the company aims to strengthen and promote its initiatives to preserve biodiversity. Another reason was to hear his opinion on whether or not it would be appropriate to establish special indices for evaluating the environmental performance of our products.



Environmental Topics: Exchanging Ideas with Experts →


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 effort 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

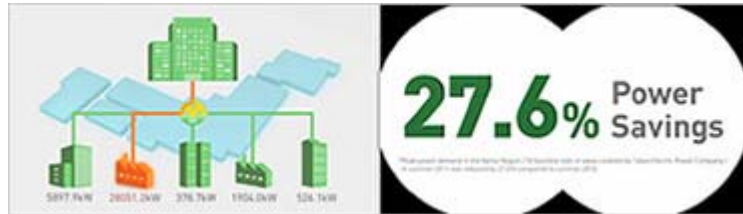
A corporate advertising campaign was launched in October 2012 to communicate the advanced environmental technologies and products of Mitsubishi Electric to a global audience. So far, advertisements relating to Eco Changes have primarily focused on our stance as a leading green company. As the next step,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



A magazine advertisement showcasing a regenerative converter



Introductory video



Video on demand system

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.

精于节能 尽心环保



Environmental advertisement

Taiwan

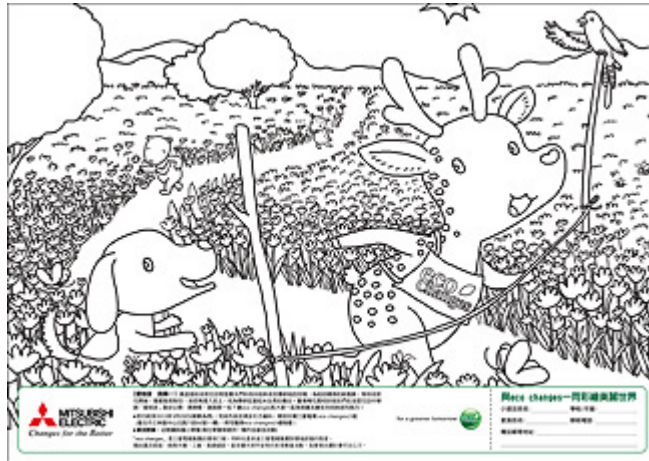
Mitsubishi Electric held an event to promote Eco Changes at the Taipei Zoo. Banner advertisements were also put up at Taichung and Tainan stations on the Taiwan High Speed Rail line.



An event at Taipei Zoo



Banner advertisements at a Taiwan High Speed Rail station



A poster and a picture for coloring used at an event

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



Corporate advertisement in Singapore

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.



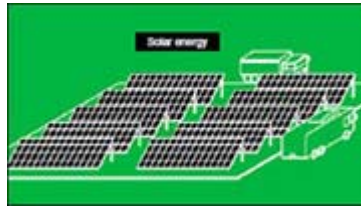
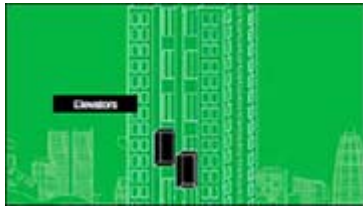
Campaign site from which KIRIE wallpaper can be downloaded



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 2013, we rolled out a corporate advertisement series called *Imadokinokodomo: Denkikinonbi* (Kids of Today: Electricity Commemoration Day) in collaboration with a newspaper publisher, and we developed corporate ads in order to increase opportunities for consumers to view our Eco Changes website.



Corporate advertisement for newspapers and magazines



Global corporate advertisement (Japanese version)



Collaborative project with a newspaper publisher Kids of Today: Electricity Commemoration Day, Kids of Today: Air Conditioners The Yomiuri Shimbun (two-page advertisement) (published March 25, 2013)



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 2012 (Japan)

Mitsubishi Electric sponsored a booth at Eco-Products 2012, which was held at Tokyo Big Sight from December 12 to 15, 2012. This year, we set up three themed zones, including the Daily Life Zone, the Business Zone, and the Society Zone with the catchphrase "Changing society, changing with you - Mitsubishi Electric's Eco Changes." The booth introduced the extensive environmental products and services of the Mitsubishi Electric Group in an easy-to-understand format, incorporating specific examples. In the Business Zone, the results of having introduced Mitsubishi Electric Group products at each site were showcased. Focusing on the example of the Communication Network Center, which was remodeled as an eco factory with the latest technologies, the environmental effects of Mitsubishi Electric products were highlighted based on real quantitative figures. In addition, the "Eco bingo 55 Go! Go!" game was held for the many children who visit the Eco-Products exhibition each year. Families enjoyed the bingo game, in which numbers are replaced with 55 Mitsubishi Electric Group products that contribute to environmental conservation.



The exhibition booth



The Mitsubishi Electric Eco bingo 55 Go! Go! cards distributed at the venue



Advertisement at railway station



An advertisement to encourage attendance

Eco-Products International Fair 2013 (Singapore)

Mitsubishi Electric exhibited at the 8th Eco-Products International Fair held at the Sands Expo & Convention Center in Singapore from March 14 to 16, 2013. This international environmental exhibition for Asia was attended by 99 organizations from eight countries. The Mitsubishi Electric Group booth, which was the largest at the exhibition, showcased a wide range of environmental products, technologies and services in the three zones of Society, Business and Daily Life. In addition, the line-up on display combined products from Eco-Products 2012 held in Japan and products from the Singapore subsidiary of Mitsubishi Electric, featuring items with activity and interactive demonstrations to draw the attention of passers-by. Moving forward, we will actively promote our comprehensive capability with regards to environmental conservation and our internationally renowned technical strengths in order to promote our image as a global leading green company.



The exhibition booth

The first Outdoor Classroom was held in October 2006 in the head office area. Currently, Outdoor Classroom activities are spreading throughout Japan, with a total of 164 having been held by fiscal 2013. Here we introduce several unique Outdoor Classrooms held in fiscal 2013.

Making Use of a Location Abundant in Nature to Experience "Satoyama" Woodland Preservation and Nature Observations (High Frequency & Optical Device Works)

Date: October 6, 2012

Location: Zugaike Park and Midorigaoka Park, Itami, Hyogo Prefecture

The High Frequency & Optical Device Works is surrounded by three parks with abundant natural settings. At one of these, Zugaike Park, "Satoyama" woodland preservation activities to protect the local cherry trees have been held on an ongoing basis in cooperation with the Society for Nurturing Cherry Blossom Trees in Zugaike Park. Accordingly, the park was made the setting of an Outdoor Classroom in collaboration with this organization. First, adult participants pruned the cherry trees and cleaned the park, experiencing firsthand the difficult nature of conservation work. Then the children joined to take part in nature observations, resulting in a program filled with activities.



The nature observations extending across the two parks were a particularly popular activity. In addition to the program of studying fallen cherry leaves and the bark of trees, and collecting acorns and pinecones, there was a request from the participants about wanting to catch Japanese crayfish. In response to this request, the classroom also became an impromptu crayfish catching contest. It was a fun-filled day in which participants learned new things and also enjoyed hands-on experiences in nature not usually possible.

VOICE

Putting the Children's Requests First

I was nervous since it was our first Outdoor Classroom, and was relieved after the day ended without any problems. There are many things to do in the local area, so we carefully prepared for the classroom by making sure not to include too much in the program and doing a trial run to ensure that everything could be seen from the perspective of the children.

We found time to be against us on the day, but we made sure to always keep in mind what the children were interested in and what they wanted to do. When I saw the beaming smiles of the children during the impromptu Japanese crayfish catching event, I felt really glad to have run the classroom. Although it is important to think, I also recognized that one can also learn a lot by observing how children play in nature.

Seiji Furukawa, Wafer Manufacturing Department, High Frequency & Optical Device Works

Learning About Biodiversity at a Freshwater Aquarium (Communication Network Center, Koriyama Plant)

Date: October 23, 2012

Location: Inawashiro Freshwater Aquarium, Inawashiro, Fukushima Prefecture

An Outdoor Classroom was held by the Koriyama Plant, which is located in an area hit by the Great East Japan Earthquake. However, the classroom was not held outside, but rather at the local aquarium.

The Inawashiro Freshwater Aquarium where the classroom was held is a facility where visitors can see various freshwater fish and amphibians in their habitats, from local fish to large Amazonian fish. On the day of the classroom, we slowly toured the facility and learned the importance of biodiversity while experiencing firsthand the varied environments of rivers, lakes and swamps encompassed by the term "freshwater" and the diverse appearances and forms of the creatures that live there.



VOICE

Wishing to Communicate the Importance of Contact with Nature

Various challenges are posed with regards to nature observations during an Outdoor Classroom held in the Tohoku region, where the effects of the earthquake persist. Even so, we wanted to hold such a classroom, given the importance of having the children, who are responsible for the future, learn about nature. After much deliberation, the aquarium finally came to mind.

On the day of the classroom we worked hard to make it as easy to understand and enjoyable as possible. Although the venue was not a natural environment, the children who participated were able to meet many different creatures, making for an enjoyable classroom. Incidentally, I also found myself refreshed by having come into contact with the creatures, which was something rather unexpected.

Ryo Okawa, Koriyama General Affairs Section, General Affairs Department,
Communication Network Center

Observing Creatures at the Local Park (Kanetsu Branch Office)

Date: August 25, 2012

Location: Saitama Children's Zoo, Higashimatsuyama, Saitama Prefecture

The Kanetsu Branch Office held an Outdoor Classroom at a Forest Park that makes the most of the local natural surroundings. About 30 employees and their children participated on the day, carrying out observations in the brook that runs through the park and using the forest insects and microbes living there to learn about the relationships between different creatures. The children went around looking at the brook and trees and carefully observing creatures such as small shrimp and water striders at close range with a magnifying glass. They also learned that insects often known as pests actually play an unexpected role in nature, making their eyes gleam with joy because of their fresh new



VOICE

Hoping to Communicate the Enjoyment from Firsthand Experiences to Adults as Well

Carefully observing the nature all around us is not something that children or even adults usually do. I myself made many discoveries when I looked anew at the brook and plants I had dismissed in the past. For example, the way in which leaves grow so that they do not overlap and can receive sunlight efficiently became evident, indicating the clever techniques by which plants flourish.

There is an enjoyment from the Outdoor Classroom which cannot be had using the Internet, because it uses all of the nature around us as teaching materials. The Outdoor Classroom provides a space to consider nature through actually experiencing the environment that we take for granted. In the future, I would like to hold an Outdoor Classroom by which adults as well as children can freely experience this enjoyment.

Masashi Mitsuya, General Affairs Department, Kanetsu Branch Office

Environmental Management: Training of Environmental Personnel



■ Energy & Electric Systems

- ▶ Ozone Generator
- ▶ Super High-Efficiency Transformers
- ▶ Space-Saving Elevator System
- ▶ Escalator

■ Industrial Automation Systems

- ▶ Electronic Hybrid Functional Control Panel
- ▶ Computerized Numerical Controller
- ▶ Wire Electric Discharge Machine
- ▶ Electronic Multi-Measuring Instrument
- ▶ Energy Measuring Unit
- ▶ Laser Processing Machine
- ▶ EPS Motor
- ▶ Spindle Motor
- ▶ Three-Phase Motor

■ Information & Communication Systems

- ▶ Optical Network Unit
- ▶ Mitsubishi Logistics Information System: Dr. Logis
- ▶ Integrated Environmental Information System
- ▶ Environmentally Resistant Wide-Area Optical Ethernet Switch
- ▶ WDM Optical Transmission Equipment
- ▶ Information Equipment Recycling Service

■ Electronic Devices

- ▶ DIIPM Module
- ▶ Laminated Bus Bar
- ▶ Contact Image Sensor

■ Home Appliances

- ▶ LED Lighting
- ▶ Jet Towel Hand Dryers
- ▶ Room Air Conditioners
- ▶ Refrigerator
- ▶ Photovoltaic Module
- ▶ Photovoltaic Inverter
- ▶ Eco Cute for Household Use
- ▶ Eco Cute for Commercial Applications
- ▶ Ventilator
- ▶ Energy Recovery Ventilator for Commercial Use
- ▶ Lossnay Central Ventilator System

Environment – Energy & Electric Systems

In the area of heavy electric machinery systems, Mitsubishi Electric is contributing broadly to society by lowering the environmental burden of energy systems and infrastructure systems, which are used in many places throughout society.

 **Ozone Generator**

 **Super High-Efficiency Transformers**

 **Space-Saving Elevator System**

 **Escalator**

Ozone Generator OS

Produces high-concentration ozone efficiently for lower life-cycle costs

The Ozone Generator is a device that produces ozone gas using electrical discharge. A high voltage with high frequency is applied between two electrodes to produce a discharge space. Oxygen gas or air is then passed through the space and some of the oxygen is converted to ozone. Ozone is a gas consisting of three bonded oxygen atoms. It has sterilization and oxidation properties that are more powerful than chlorine. It also has exceptional deodorization and de-pigmentation abilities. Water treatment systems that use the power of ozone have been recognized for their purification capabilities and environmental compatibility. They continue to be installed at sites involved in potable water treatment, sewage treatment and industrial wastewater treatment. The Ozone Generator OS produces high-concentration ozone efficiently. It generates concentrations as high as 240 g/m³ (N), an improvement upon Mitsubishi Electric's previous model, which could produce an ozone concentration as high as 150 g/m³ (N).



M Materials: Effective use of resources

- Approximately 40% lower weight compared to previous Mitsubishi Electric model.

E Energy: Efficient use of energy

- Approximately 10% lower power consumption compared to previous Mitsubishi Electric model.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Unlike sterilization and oxidation using chemicals such as chlorine, ozone breaks down after treatment and reverts to oxygen, which prevents environmental pollution.

Note

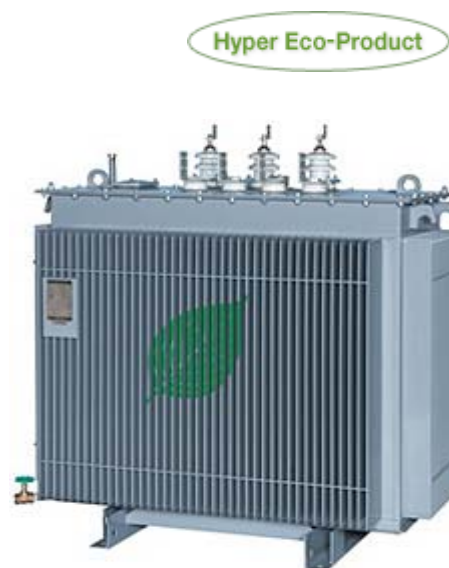
Shortening the length of the discharge gap has allowed Mitsubishi Electric's Ozone Generator to produce high-concentration ozone efficiently. The discovery and application of this technology has been duly recognized, leading to it being honored with the following awards.

1. 21st Century Invention Prize at the 2006 National Invention Awards
"Technology for producing high-concentration ozone efficiently"
2. Japan Machinery Federation Chairman's Prize at the 2006 Outstanding Energy Efficient Device Awards
"Tubular type ozone generator with small discharge gap"
3. Prime Minister's Award at the 2007 Japan Industrial Technology Awards
"High-concentration generator with very small discharge gap"

Super High-Efficiency Transformers EX- II Series

Factor: 1.214; Performance Factor: 1.00;
Environmental Load Factor: 1.214

Step-down transformers use electromagnetic induction to reduce the alternating high-voltage electricity (e.g., 6,600V) supplied by electric utilities to the voltage levels used in factories and buildings. Our ultra-efficient EX-II Series power transformers are specifically designed to reduce environmental impact based on suppressing power loss during operation to minimize CO₂ emissions and contribute to the prevention of global warming. Noise produced by the transformers has also been minimized.



Reasons for Hyper Eco-Product Certification

- This product has been certified to carry Mitsubishi Electric's environmental mark

M Materials: Effective use of resources

- Use of resources increased by approximately 34% due to our goal of creating products with reduced or zero load-loss.

E Energy: Efficient use of energy

- Power consumption reduced by approximately 51% through creating products with reduced or zero load-loss.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminated the use of chrome in coating materials to reduce toxicity.

Detailed environmental data

RA-TS

Note

EX-II Series power transformers realize the same efficiency as the previous EX Series while achieving installation space and external dimensions equal to those of N Series transformers, which set the current standard in Japan's Top Runner Program. In other words, the EX-II Series delivers high energy efficiency together with space savings. Here's an example of how EX-II power transformers reduce power consumption and environmental impact. If EX-II Series power transformers replaced all baseline products manufactured in 2000, CO₂ emissions would be reduced 12.1 tons* annually (when applied to three-phase 6.6kV/210V, 1,000kVA 50Hz systems).

* Based on a CO₂ emission coefficient of 0.559 kg-CO₂/kWh, the average value for general electricity utility companies and other electricity suppliers in Japan. (Source: Notifications 1 and 2 of the Japanese Ministry of Economy, Trade and Industry and Ministry of the Environment, 2012).

Super High-Efficiency Transformers

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2000 product	1	1	1	1.732	1
	RA-T (3φ 1,000kVA 50Hz)					
Evaluated product	2012 product	1.34	0.49	0	1.427	1
	RA-TS (3φ 1,000kVA 50Hz)					
Details of improvement		Use of resources increased approx. 34% aiming to reduce load-loss	Power consumption reduced approx. 51% via reduced or zero load-loss	Eliminated the use of chrome in coating materials		
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.214	
Performance factor: B		(Added value of new product)/(Added value of standard product)			1	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			1.214	

*For operation of 3φ 1,000kVA 50Hz transformer with load factor of 50%.

Environmental load factor

	Baseline product (2000 product equivalent)	Evaluated product
M	(1) Weight of product	2,700.0 kg
	Iron	1,852.1 kg
	Copper	2.0 kg
	Aluminum	197.9 kg
	Resin (Recycled material)	0.0 kg
	Resin (Non-recycled material)	0.0 kg
	Others	648.0 kg
	(2) Weight of recycled material	684.1 kg
	(3) Weight of reused parts	0.0 kg
	(4) Weight of 3R material [(2) + (3)]	684.1 kg
	(5) Consumption of virgin resources [(1) – (4)]	2,015.9 kg
	(6) Recyclable weight (3R possible)	2,052.0 kg
	(7) Non-recyclable weight [(1) – (6)]	648.0 kg
E1	Power consumption during annual operation (E1)	42,508 kWh

	Power consumption in annual standby state (E2)	0	kWh	0	kWh
	Total (Annual power consumption)	42,508	kWh	20,882	kWh
	Lead usage in solder (T1)	0	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
T	Hexavalent chromium usage (T4)	74	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g
	HCFC refrigerant ²	0	g	0	g

*For operation of 3φ 1,000kVA 50Hz transformer with load factor of 50%.

Performance factor

Example of improvement of performance/life	Performance/life index
Performance factor	1

Machine-Room-Less Elevator System AXIEZ

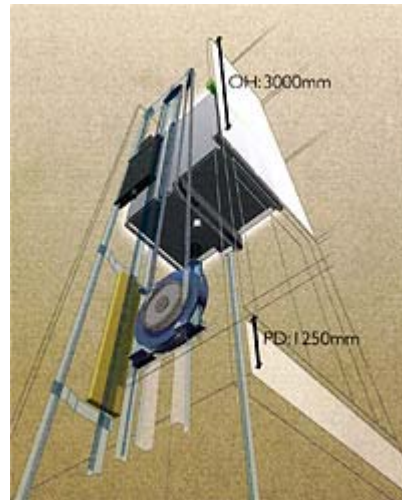
Factor: 1.091; Performance Factor: 1.00;
Environmental Load Factor: 1.091
(applies only to elevator equipment)

* Factors for baseline products manufactured in fiscal 1996.

* The performance factor of this elevator system has not been evaluated.

One of the Industry's Most Compact and Space-Saving Elevator Systems Less Impact on the Environment through Reduced Use of Natural Resources and Hazardous Substances

The AXIEZ machine-room-less elevator system responds to diversified needs through enhanced performance and functionality. The development of more compact equipment and the Smooth Emergency Terminal Slowdown (SETS) unit* enables smaller elevator shafts. Pit depth is standardized to 1,250mm and the elevator shaft overhead dimension to 3,000mm. Operating speeds range from 45 to 105 meters per minute.



* A unit that uses microcomputers to monitor elevator speed and immediately detect and reduce excessive speed to a much slower and smoother pace near both ends of the elevator shaft (highest and lowest floors). This enables more compact shock absorbers and reduces the space needed at the top and bottom of the elevator shaft.

Detailed environmental data

P9-CO-60, 6stop

M Materials: Effective use of resources

- Overall weight of elevator equipment reduced by up to 400kg per car (equivalent to approx. 1,200 tons per year) through streamlining of the elevator shaft and car equipment (return car, machinery mount, car dimensions, emergency brake, etc.).
- Recycled plastic materials adopted for part of the car control panel.

E Energy: Efficient use of energy

- Adopted LED ceiling lighting in cars, reduced the standby power consumption and reduced overall power consumption up to 20% compared to conventional elevators (standard specifications) through optimizing the balance between the car and counterweight.
- Electricity from regenerative braking during elevator operation can be utilized to power other equipment inside the building, helping to achieve a 30% reduction* in electricity usage.

* When equipped with the optional regenerative capacitor. Results may vary depending on specifications and actual operational conditions.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Use of lead-free materials for circuit boards and use of plating that does not contain hexavalent chrome as part of efforts to promote the use of RoHS-compliant parts and materials.
- Reduced usage of toluene, xylene, and other atmospheric and soil contaminants.
- In compliance with building laws and regulations, reduced emissions of substances subject to restrictions to levels at or below standards for the entire elevator system. Reduced formaldehyde concentrations to levels below the standard of 100µg/m³.

Space-Saving Elevator System

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	1996 product	1	1	1	1.732	1
Evaluated product	2005 product	0.829	0.906	1	1.584	1
	P9-CO-60, 6stop					
Details of improvement		Reduction in weight of equipment around cars; Reduction in environmental load during disposal due to use of plant-derived plastic	Promotion of energy savings	Adoption of RoHS-compliant parts and materials; Reduction in toluene, xylene and other hazardous substances that contaminate the air and soil; Prevention of sick-house syndrome		Details: (1) Application of variable-speed elevator system (2) Increased safety owing to universal door system
Environmental load factor: A		(1/Environmental load of new product)/ (1/Environmental load of standard product)			1.094	
Performance factor: B		(Added value of new product)/ (Added value of standard product)			1	
Factor X: AxB		(Added value of new product/Environmental load of new product)/ (Added value of standard product/Environmental load of standard product)			1.094	

Environmental load factor

		Baseline product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	280	kg	232	kg
	Iron	280	kg	232	kg
	Copper		kg		kg
	Aluminum		kg		kg
	Resin (Recycled material)		kg		kg
	Resin (Non-recycled material)		kg		kg
	Others		kg		kg
	Reduced weight after conversion into identical function ¹		kg		kg
	(2) Weight of recycled material	98	kg	81.2	kg
	(3) Weight of reused parts		kg		kg
	(4) Weight of 3R material [(2) + (3)]	98	kg	81.2	kg
	(5) Consumption of virgin resources [(1) – (4)]	182	kg	150.8	kg
	(6) Recyclable weight (3R possible)		kg		kg
(7) Non-recyclable weight [(1) – (6)]	280	kg	232	kg	

	Power consumption during annual operation (E1)	2,869	kWh	2,600	kWh
	Power consumption in annual standby state (E2)		kWh		kWh
	Total (Annual power consumption)		kWh		kWh
T	Lead usage in solder (T1)	0	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)		g		g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g
	HCFC refrigerant ²				
	Total				

Factors with 3R viewpoint: Addition method

		Quantitative data				Baseline product	Evaluated product
		Baseline product	(Unit)	Evaluated product	(Unit)		
M	2 x Weight -3R-3R possible [(5) + (7)]	—	kg	—	kg	1	0.829
E	Reduction in energy consumption	—	kWh	—	kWh	1	0.906
T	Reduction in hazardous substances	—	g	—	g	1	1
Environmental load (MET resultant value)						1.732	1.584
Environmental load factor						1.094	

- 1 The weight of the function absent in the baseline product, which cannot be expressed as an influence on environmental load or as the added value of the product. It is the weight of the part not subject to evaluation (oxygen adding function and ventilation function).
- 2 Evaluation after HCFC refrigerant is added to the environmentally hazardous substances.

Escalator ZJ-S

Factor: 1.280

Performance Factor: 1.000*

Environmental Impact Factor: 1.280

* No performance factor evaluation for this product.

ZJ-S constitutes a new escalator design providing high quality and reliability. Particular attention was paid to safety and convenience in creating this design.



Detailed environmental data

ZJ-S

M Materials: Effective use of resources

- The ZJ-S design is characterized by its relatively small number of parts and light weight. Installing ZJ escalators for floor heights of 6.5–7.0 m results in the use of less material than required by other escalator models.
- To minimize the amount of material used in truss members, the size of the truss chords and other parts was scaled down, resulting in lighter parts and overall weight reduction.
- Recyclable thermoplastic polyurethane handrails and rollers were installed.

E Energy: Efficient use of energy

- An optional automatic operation function helps make the escalator more energy efficient. A line of VVVF inverter-based post and postless products that stop/slow down when not in use has been prepared; combining these features with variable speed functionality results in expanded application for automatic operation functions.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Active employment of RoHS-compliant parts and materials (Switched to lead-free boards, and plating free of hexavalent chromium.)
- Reduced usage of toluene, xylene, and other atmospheric and soil contaminants.

Escalator

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Standard product	1996 product	1	1	1	1.732	1
	JS-S					
Evaluated product	2009 product	0.960	0.954	0	1.353	1
	ZJ-S					
Details of improvement		Maximized number of parts that use recycled plastic	Industry top-class energy savings	Eliminated all substances restricted by the EU's RoHS Directive		Items for consideration: <ul style="list-style-type: none"> • Upgraded quality • Improved safety • Enhanced convenience • Commoditization of structural and drive components • Extension of applied elevation height (story height) • Revamped design • Broader electrical options
Environmental impact factor		(1/Environmental impact of new product)/ (1/Environmental impact of standard product)			1.280	
Performance factor		(Added value of new product)/ (Added value of standard product)			1	
Factor X: Environmental impact factor × Performance factor		(Added value, environmental impact of new products)/ (Added value, environmental impact of standard products)			1.280	

Environmental Impact Factor

	Standard product (1990 product equivalent)		Evaluated product	
(1) Weight of product	8924	kg	8564	kg
Iron	7055	kg	6905	kg
Copper	-	kg	-	kg
Aluminum	1260	kg	1050	kg
Resin (Recycled material)	-	kg	-	kg
Resin (Non-recycled material)	173	kg	178	kg
Others	436	kg	431	kg
(2) Weight of recycled material	-	kg	-	kg
(3) Weight of reused parts	0	kg	0	kg
(4) Weight of 3R material [(2) + (3)]	-	kg	-	kg
(5) Consumption of virgin resources [(1) – (4)]	-	kg	-	kg
(6) Recyclable weight (3R possible)	-	kg	-	kg
(7) Nonrecyclable weight [(1) – (6)]	-	kg	-	kg
E Power consumption during annual operation (E1)	284,000	kWh	271,000	kWh
E Power consumption in annual standby state				

(E2)	-	kWh	-	kWh
Total (Annual power consumption)	284,000	kWh	271,000	kWh
Lead usage in solder (T1)	76	g	0	g
Cadmium usage (T2)	0	g	0	g
Mercury usage (T3)	0	g	0	g
T Hexavalent chromium usage (T4)	(Used in plating*)	g		g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0		0	

*As determination of the volumes used in 1990 is problematic, values for this year are excluded.

In industrial Mechatronics, we help customers reduce their environmental burden by increasing the energy- and resource-efficiency of various devices that are indispensable for industry.

 **Electronic Hybrid Functional Control Panel**

 **Computerized Numerical Controller**

 **Wire Electric Discharge Machine**

 **Electronic Multi-Measuring Instrument**

 **Energy Measuring Unit**

 **Laser Processing Machine**

 **EPS Motor**

 **Spindle Motor**

 **Three-Phase Motor**



Environment – Electronic Hybrid Functional Control Panel

Electronic Hybrid Functional Control Panel MACTUS 30LCB

Integration simplifies and enhances the performance of water treatment plants

With conventional systems for power instrumentation and control at drinking water treatment facilities, sewage treatment facilities and other water treatment plants, it was necessary to produce, install, wire and coordinate (on-site) separate control panels for power, control and instrumentation circuits. The Electronic Hybrid Functional Control Panel consolidates these previously separate circuits and reduces the number of control panels to save space, reduce wiring, lower power consumption and provide high-performance electrical facilities. It is the first Mitsubishi Electric product that has been certified with the Eco-Leaf environmental label (conforms to the ISO Type III framework).



M Materials: Effective use of resources

- Fewer control panels and less wiring due to integration of previously separate functions.
- Systems previously requiring three control panels can be configured with two panels (scope of consolidation differs depending on the size of the plant).

E Energy: Efficient use of energy

- Energy is saved through consolidating previously separate functions and by integrating and changing controls from H/W circuits to S/W circuits. Power consumption is reduced by up to 40% compared to Mitsubishi Electric's previous system (energy savings differ depending on the size of the plant).

Computerized Numerical Controller M700VS Series

Factor 2.72: Performance Factor 1.12:
Environmental Load Factor 2.429

Hyper Eco-Product

Best controller for top level manufacturing

The Computerized Numerical Controller is a computer that accurately controls the amount of movement and speed of machine tool implements. With fewer long-life parts, such as HDDs and the cooling fans, part replacement maintenance and machine tool waste is also reduced.



Reasons for Hyper Eco-Product Certification

- Factor X is more than or equal to 2

Detailed environmental data

M700VS Series

M Materials: Effective use of resources

- Compact and lightweight resource-saving design (volume: 13% reduction mass; 29% reduction).

E Energy: Efficient use of energy

- We have developed the high-efficiency and electric power saving graphic circuit, which reduces power consumption by approximately 66% compared to the previous model.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Conforms to the EU RoHS Directive; the occurrence of six regulated substances (lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE) is controlled.

Computerized Numerical Controller

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	2004 product	1	1	1	1.732	1
	M700 series					
Evaluated product	2008 product	0.62	0.34	0	0.713	
	M700VS series					
	Details of improvement	Compact and lightweight resource-saving design.	Reduced power consumption	Complies with Europe's RoHS Directive		Achieves high-speed, high-precision control (1.12 times better performance than standard product)
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			2.429	
Performance factor: B		(Added value of new product)/(Added value of standard product)			1.12	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.72	

Environmental load factor

		Standard product (2004 product equivalent)		Evaluated product	
M	(1) Weight of product	7.03	kg	5.02	kg
	Iron	2.31	kg	1.83	kg
	Copper	0	kg	0	kg
	Aluminum	0.59	kg	0.47	kg
	Resin (Recycled material)	0	kg	0	kg
	Resin (Non-recycled material)	1.48	kg	1.2	kg
	Others	2.65	kg	1.52	kg
	Reduced weight after conversion into identical function ¹		kg		kg
	(2) Weight of recycled material	0.91	kg	0.72	kg
	(3) Weight of reused parts	0	kg	0	kg
(4) Weight of 3R material [(2) + (3)]	0.91	kg	0.72	kg	
(5) Consumption of virgin resources [(1) – (4)]	6.12	kg	4.3	kg	
(6) Recyclable weight (3R possible)	6.94	kg	4.97	kg	
(7) Nonrecyclable weight [(1) – (6)]	0.1	kg	0.05	kg	
E	Power consumption during annual operation (E1)	267	kWh	92	kWh
E	Power consumption in annual standby state (E2)	0	kWh	0	kWh

	Total (Annual power consumption)	267	kWh	92	kWh
T	Lead usage in solder (T1)	3	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g
	HCFC refrigerant ²	0	g	0	g
	Others	0	g	0	g
	Total	3	g	0	g

Factors with 3R viewpoint: Addition method

		Quantitative data				Standard product	Evaluated product
		Standard product	(Unit)	Evaluated product	(Unit)		
M	2 x Weight -3R-3R possible [(5) + (7)]	-	kg	-	kg	1	
E	Reduction in energy consumption	-	kWh	-	kWh	1	
T	Reduction in hazardous substances	-	g	-	g	1	
Environmental load (MET resultant value)							
Environmental load factor							

1 The weight of the function absent in the standard product, which cannot be expressed as an influence on environmental load or as the added value of the product. It is the weight of the part not subject to evaluation. (Oxygen adding function and ventilation function)

2 Evaluation after HCFC refrigerant is added to the environmentally hazardous substances.

Performance factor

Example of improvement of performance/life	Performance/life index
Improved NC performance due to faster micro-line fed <ul style="list-style-type: none"> Standard product: 135 m/min Evaluated product: 151 m/min Details on Eco Leaf environmental label (link to website of Japan Environmental Management Association for Industry)	1.12
Performance factor	1.12

Wire Electric Discharge Machine NA series

Factor NA1200:4.60 NA2400:3.91
Performance Factor NA1200:3.086
NA2400:3.086
Environmental Load Factor NA1200:1.492
NA2400:1.267

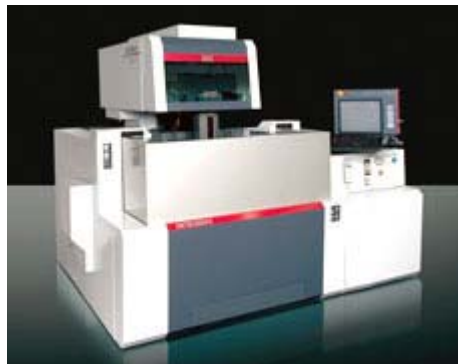
Hyper Eco-Product

Next-generation WEDM provides high-precision machining and lower running costs

A wire electric discharge machine is a type of machine tool classified by JIS regulations as a special processing machine. It provides precision machining by utilizing electrical discharge between the workpiece and wire electrodes to melt and remove the workpiece. It uses significantly less power and wire than Mitsubishi Electric's previous model, helping to reduce running costs.



NA1200



NA2400

Reasons for Hyper Eco-Product Certification

- Factor rating of 3 or more

Detailed environmental data

NA1200
NA2400

M Materials: Effective use of resources

- Optical product design delivers increased processing size (due to a larger machine) without increasing the amount of cast metal used.
- Unit design reduces total number of parts.
- Resources saved by digitizing the user's manual.

E Energy: Efficient use of energy

- A new power supply reduces processing time by as much as 30% compared to the previous Mitsubishi Electric model.
- Brand new control system called Intelligent Master reduces wire consumption by up to 44% compared to the previous Mitsubishi Electric model.
- New "wake-up mode" function reduces standby power consumption.
- Total power consumption is cut by up to 69% compared to the previous Mitsubishi Electric model.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- New components were selected for the circuit board. Circuit boards with lead-free solder substantially reduce the amount of lead used.

Note

The NA Series was designed to provide delicate, high-precision machining and lower running costs while also being operator friendly and easy to use. The NA 2400 Series features 37% more machine strokes, an especially large table and an automatic elevation tank. The work position can be checked from three directions, which makes large work set-up easy. The product is also readily compatible with automation via robots or other automation equipment.

Additionally, a survey of worker movement resulted in improvement to the positioning of the control unit, which helps the product achieve Universal Design ideals.

The product's user-friendly design was recognized, and it was awarded a Good Design Award for fiscal 2008.

Wire Electric Discharge Machine

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	1990 product	1	1	1	1.732	1
	90SZ					
Evaluated product	2009 product	0.89	0.66	0.33	1.161	
	NA1200					
	Details of improvement	Reduced product weight	Supply pump turned off when processing on standby	Uses lead-free P-plating	-	Marketed new, mid-size, wire-cut electrical discharge machine that provides more convenience to the customer due to linear drive, a new power supply and automatic elevation tank improved XY stroke.
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.492	
Performance factor: B		(Added value of new product)/(Added value of standard product)			3.086	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			4.603	

Wire Electric Discharge Machine

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	1990 product	1	1	1	1.732	1
	110SZ					
Evaluated product	2009 product	1.1	0.7	0.3	1.338	
	NA2400					
	Details of improvement	Increase in product weight	Supply pump turned off when processing on standby	Uses lead-free P-plating	-	Marketed new, mid-size wire-cut electrical discharge machine that provides more convenience to the customer due to linear drive, a new power supply, raising and lowering in three directions and improved XY stroke.
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.295	
Performance factor: B		(Added value of new product)/(Added value of standard product)			3.086	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			3.995	

Electronic Multi-Measuring Instrument

ME110SSR / ME110SSR-4APH / ME110SSR-4A2P / ME110SSR-C

Factor: 1.209; Performance Factor: 1.833;
Environmental Load Factor: 2.217

Hyper Eco-Product

Enhanced Operational Ease and Viewing Clarity

Electronic multi-measuring instruments measure and display key energy data such as electric voltage, current, power and quantity which is useful for analysis of how energy is being used in buildings and factories. Data can be relayed remotely via output, communication and other functions. In addition, these devices contribute to energy-savings through higher efficiency circuits.



Detailed environmental data

ME110SSR / ME110SSR-4APH / ME110SSR-4A2P / ME110SSR-C

M Materials: Effective use of resources

- Number of parts reduced by 6% compared to previous model.

E Energy: Efficient use of energy

- Power consumption reduced by 12% compared to previous model.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of any of the six hazardous substances (lead, mercury, cadmium, hexavalent chromium, PBB and PBDE) specified in the EU RoHS Directive.

Electronic Multi-Measuring Instrument

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2005 product	1	1	1	1.732	1
	ME110NSR					
Evaluated product	2011 product	0.754	0.871	0.850	1.432	1.833
	ME110SSR					
Details of improvement						
Environmental load factor: A		(1/Environmental load of new product)/ (1/Environmental load of standard product)			1.209	
Performance factor: B		(Added value of new product)/ (Added value of standard product)			1.833	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.217	

Environmental load factor

		Baseline product (2005 product equivalent)		Evaluated product	
M	(1) Weight of product	0.545	kg	0.483	kg
	Iron	0	kg	0	kg
	Copper	0	kg	0	kg
	Aluminum	0	kg	0	kg
	Resin (Recycled material)	0.053	kg	0.053	kg
	Resin (Non-recycled material)	0.005	kg	0.005	kg
	Others	0.487	kg	0.425	kg
	(2) Weight of recycled material	0.053	kg	0.053	kg
	(3) Weight of reused parts	0.2	kg	0.2	kg
	(4) Weight of 3R material [(2) + (3)]	0.253	kg	0.253	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.292	kg	0.292	kg
	(6) Recyclable weight (3R possible)	0.373	kg	0.363	kg
	(7) Non-recyclable weight [(1) – (6)]	0.172	kg	0.12	kg
E	Power consumption during annual operation (E1)	70	kWh	61	kWh
	Power consumption in annual standby state (E2)	0	kWh	0	kWh
	Total (Annual power consumption)	70	kWh	61	kWh
T	Lead usage in solder (T1)	0	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g

HCFC refrigerant	0	g	0	g
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Performance factor

Example of improvement of performance/life	Performance/life index
Wide viewing angle LCDs adopted	1.2
High-intensity LEDs adopted for backlights	1.2

Energy Measuring Unit (EcoMonitorPro)

Factor 3.96: Performance Factor 2.50:
Environmental Load Factor 1.582

These gauges make it possible to measure electricity usage for electric power systems covering multiple factories and buildings at the level of individual facilities or lines, and at 1-second or 1-minute intervals.

Hyper Eco-Product



Reasons for Hyper Eco-Product Certification

- Factor rating of 2 or more

Detailed environmental data

EMU2-HM1-B

M Materials: Effective use of resources

- Reduced virgin resource usage in products by 45%.
- Reduced the volume of unrecyclable materials by 45%.

E Energy: Efficient use of energy

- Reduced electricity consumption by 51% during usage and 82% during standby.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Reduced the amount of lead used in solder by 12.5%.

Energy Measuring Unit

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	1998 product	1	1	1	1.732	1
	EMU-B3P5					
Evaluated product	2003 product	0.55	0.37	0.88	1.095	2.5
	EMU2-HM1-B					
Details of improvement		45% reduction in consumption of virgin resources for product 45% reduction in nonrecyclable weight	Reduction of power consumption during use by 51% 82% reduction in the standby state	12.5% reduction in lead in solder		(Details) Number of factors of energy measurement 4 → 10: 2.5 times greater
Environmental load factor: A		(1/Environmental load of new product)/ (1/Environmental load of standard product)			1.582	
Performance factor: B		(Added value of new product)/ (Added value of standard product)			2.5	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			3.96	

Environmental load factor

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	0.282	kg	0.155	kg
	Iron		kg		kg
	Copper		kg		kg
	Aluminum		kg		kg
	Resin (Recycled material)		kg		kg
	Resin (Non-recycled material)		kg		kg
	Others	0.282	kg	0.155	kg
	Reduced weight after conversion into identical function ¹		kg		kg
	(2) Weight of recycled material	0	kg	0	kg
	(3) Weight of reused parts		kg		kg
	(4) Weight of 3R material [(2) + (3)]	0	kg	0	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.282	kg	0.155	kg
	(6) Recyclable weight (3R possible)	0.027	kg	0.0163	kg
	(7) Nonrecyclable weight [(1) – (6)]	0.255	kg	0.1387	kg

	Power consumption during annual operation (E1)	0.0043	kWh	0.0021	kWh
	Power consumption in annual standby state (E2)	0.0035	kWh	0.0006	kWh
	Total (Annual power consumption)		kWh		kWh
T	Lead usage in solder (T1)	0.8	g	0.7	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g
	HCFC refrigerant ²				
	Total				

Factors with 3R viewpoint: Addition method

		Quantitative data				Standard product	Evaluated product
		Standard product	(Unit)	Evaluated product	(Unit)		
M	2 x Weight -3R-3R possible [(5) + (7)]	-	kg	-	kg	1	0.546927374
E	Reduction in energy consumption	-	kWh	-	kWh	1	0.365988426
T	Reduction in hazardous substances	-	g	-	g	1	0.875
Environmental load (MET resultant value)						1.7321	1.094852538
Environmental load factor						1.5820	

- 1 The weight of the function absent in the standard product, which cannot be expressed as an influence on environmental load or as the added value of the product. It is the weight of the part not subject to evaluation. (Oxygen adding function and ventilation function)
- 2 Evaluation after HCFC refrigerant is added to the environmentally hazardous substances.

Performance factor

Example of improvement of performance/life	Performance/life index
Number of factors of energy measurement 4 → 10: 2.5 times greater	2.5

Two-Dimensional CO₂ Laser Processing Machines eX Series

Factor: 2.42; Performance Factor: 1.85;
Environmental Load Factor: 1.308

Hyper Eco-Product

Laser processing machines use the directional and high-energy characteristics of laser to achieve precision machining via a process of irradiating the laser beam to melt (or cut away) parts of the workpiece to shape the final product. The eX Series, recognized as a world leader in two-dimensional CO₂ laser processing machines, maximizes productivity and realizes simple dual-action operation.



The eX Series won the 32nd (2011) Commendation for Excellent Energy Equipment, the Agency for Natural Resources and Energy Director's Award sponsored by the Japan Machinery Federation.

Detailed environmental data

eX Series

M Materials: Effective use of resources

- Optimal structural design used, resulting in reduced weight of principal structural components and enhanced rigidity of processing equipment.

E Energy: Efficient use of energy

- Improved processing speeds and control technologies, resulting in reduced processing time of thin sheets by approximately 20% compared to our previous models.
- Use of the latest piercing technologies to reduce the processing time of thick and intermediate-thickness mild-steel plates by approximately 30% compared to our previous models.
- Equipped with an Eco mode which reduces power consumption during non-processing time to reduce standby consumption costs up to 99% compared to our previous models.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Reduced use of lead through fewer parts attached using a solder.

Laser Processing Machine

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2000 product	1	1	1	1.732	1
	LV Series					
Evaluated product	2012 product	0.889	0.68	0.707	1.324	1.85
	eX Series					
Details of improvement		Reduced weight of principal structural components	Reduced processing time; Eco mode	Reduced use of lead through fewer soldered parts		
Environmental load factor: A		(1/Environmental load of new product)/ (1/Environmental load of standard product)			1.308	
Performance factor: B		(Added value of new product)/ (Added value of standard product)			1.85	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.420	

Environmental load factor

		Baseline product (2000 product equivalent)		Evaluated product	
M	(1) Weight of product	11,200.0	kg	9,966.7	kg
	Iron	9,730.0	kg	8,596.7	kg
	Copper	30.0	kg	30.0	kg
	Aluminum	120.0	kg	120.0	kg
	Resin (Recycled material)	0.0	kg	0.0	kg
	Resin (Non-recycled material)	0.0	kg	0.0	kg
	Others	1,320.0	kg	1,220.0	kg
	(2) Weight of recycled material	3,430.7	kg	3,034.0	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	3,430.7	kg	3,034.0	kg
	(5) Consumption of virgin resources [(1) – (4)]	7,769.3	kg	6,932.6	kg
	(6) Recyclable weight (3R possible)	10,050.0	kg	8,896.7	kg
	(7) Non-recyclable weight [(1) – (6)]	1,150.0	kg	1,070.0	kg
E	Power consumption during annual operation (E1)	174,389	kWh	117,611	kWh
	Power consumption in annual standby state (E2)	9,297	kWh	4,223	kWh
	Total (Annual power consumption)	183,686	kWh	124,921	kWh
	Lead usage in solder (T1)	30	g	20	g
	Cadmium usage (T2)	0	g	0	g

Mercury usage (T3)	0	g	0	g
Hexavalent chromium usage (T4)	0	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0	g	0	g

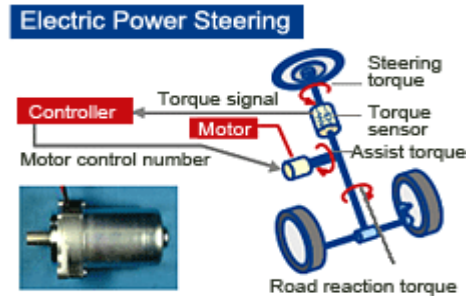
Performance factor

Example of improvement of performance/life	Performance/life index
Sample workpiece: SUS304 t1mm; Processing speed improved 1.7 times	1.7
Sample workpiece: SUS400 t12mm; Processing speed improved 2.0 times	2
Performance factor	1.85

EPS Motor (30A Class)

Factor 1.451: Performance Factor 1.085:
Environmental Load Factor 1.337

The EPS Motor is used in power steering systems, which provide assistance in turning automobile steering wheels. Because the electric power steering system (EPS) engages the motor only when the steering wheel is being turned, it consumes less energy than the traditional hydraulic power steering system (HPS), which is driven by a hydraulic pump that is constantly in operation when an engine is on. This can result in a fuel efficiency improvement of about 3%-5%. Replacing HPSs with EPSs, therefore, would increase fuel economy and significantly reduce CO2 emissions.



M Materials: Effective use of resources

- Use of closed-loop recycled plastic consisting of waste recovered from the formation process to make a holder for protecting and securing a magnet on the stator.
- Reduction of copper coil edge line parts volume through innovations in edge line processing for windings.
- Weight reduction through simplification of the structure of the connection parts for attachment of the mechanism side to the motor.

E Energy: Efficient use of energy

- Increased energy efficiency through optimal electromagnetic design of the rotor winding coil.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminated environmental burden substances covered by the EU-ELV Directive's phased usage restrictions, and reduced usage of other heavy metals.

Note

Received the fiscal year 2007 Commendation for Science and Technology by the Minister of Education Culture, Sports, Science and Technology.

Received the fiscal year 2007 Commendation for Science and Technology by the Minister of Education Culture, Sports, Science and Technology for our EPS (motor and controller). Mitsubishi Electric was praised for benefiting the global environment by making it possible to switch from HPSs to EPSs, and increase fuel economy by 3%-5%.

Spindle Motor SJ-D Series

Factor: 1.470

Performance Factor: 1.000*

Environmental Impact Factor: 1.470

*No performance factor evaluation for this product.

The SJ-D Series Spindle Motors? Fusing Next-Generation Functionality and Design

Spindle motors are used to rotate the cutting edges and processing tools of machining centers, lathes and other machine tools. Mitsubishi Electric continues to strive for energy savings and resource conservation in its products as part of its environmental countermeasures. In addition to such environmental considerations, the SJ-D

Series of spindle motors also offers enhanced safety and reliability, and delivers maximum motor performance.

In a field where industrial equipment products have a lifespan in excess of 10 years, this series fuses functionality and design to become a product unaffected by prevalent trends. The SJ-D Series of spindle motor received a Good Design Award (Best 15) in 2009.



Detailed environmental data

SJ-D

M Materials: Effective use of resources

- The SJ-D Series' revised electrical design cuts the use of copper wiring by 43%, while its optimized structure lowers the parts count.

E Energy: Efficient use of energy

- The optimal electrical design facilitates a 25% reduction in motor power loss compared with conventional models, lowering power consumption.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Compliant with European RoHS Directive.

Spindle Motor

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Standard product	1990 product	1	1	1	1.732	1
	SJ-V11-01T					
Evaluated product	2009 product	0.855	0.817	0	1.732	1
	SJ-DJ11/100-01					
Details of improvement		Maximize number of parts that use recycled plastic	Industry top-class energy savings	Eliminated all substances restricted by the EU's RoHS Directive		
Environmental impact factor		(1/Environmental impact of new product)/ (1/Environmental impact of standard product)			1.470	
Performance factor		(Added value of new product)/ (Added value of standard product)			1*	
Factor X: Environmental impact factor × Performance factor		(Added value, environmental impact of new products) / (Added value, environmental impact of standard products)			1.470	

*No performance factor evaluation for this product.

Environmental Impact Factor (comparison at rated capacity of 11 kw)

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	80.8	kg	55.1	kg
	Iron	70.0	kg	40.0	kg
	Copper	6.1	kg	3.0	kg
	Aluminum	4.2	kg	11.6	kg
	Resin (Recycled material)	-	kg	-	kg
	Resin (Non-recycled material)	-	kg	-	kg
	Others	0.5	kg	0.5	kg
	(2) Weight of recycled material	25.3	kg	16.1	kg
	(3) Weight of reused parts	-	kg	-	kg
	(4) Weight of 3R material [(2) + (3)]	80.3	kg	54.6	kg
(5) Consumption of virgin resources [(1) – (4)]	55.5	kg	39.0	kg	
(6) Recyclable weight (3R possible)	80.3	kg	54.6	kg	
(7) Nonrecyclable weight [(1) – (6)]	0.5	kg	0.5	kg	
E	Power consumption during annual operation (E1)	-	kWh	-	kWh
	Power consumption in annual standby state (E2)	-	kWh	-	kWh
	Total (Annual power consumption)	7.05E+10	kWh	7.03E+10	kWh
	Lead usage in solder (T1)	0	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g

Hexavalent chromium usage (T4)	0	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0		0	

Factor: 1.209; Performance Factor: 1.00;
Environmental Load Factor: 1.209

*This is the data of representative models.

High-Performance Energy-Efficient Motors Compliant with U.S. Department of Energy Standards



Motors are used in various industrial equipment including fans, pumps and many other devices. For this reason, making motors more energy efficient is a vital part of efforts to reduce environmental impact. Today, various laws and regulations relating to manufacturing and sales of motors are in place around the world to ensure the high energy efficiency of motors.

The SF-PR Series of three-phase alternating current induction motors has received compliance certification from the U.S. Department of Energy, and satisfies the required efficiency level set out in the energy-efficiency laws and regulations in the U.S., particularly NEMA MG-12-12 (IE3), within the dimensions defined by the International Electrotechnical Commission (IEC). This motor complies with the Top Runner standard of the Act on the Rational Use of Energy. (Energy Conservation Law of Japan).

Detailed environmental data

SF-PR Series

M Materials: Effective use of resources

- Use of our original steel plate frame technology to attain the efficiency level required by U.S. laws and regulations. This also helps to curb additional material usage associated with an increase in motor size.

E Energy: Efficient use of energy

- The optimal design facilitates a 2% improvement in energy efficiency compared to the previous SF-HR Series.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Compliant with the EU RoHS Directive.

Three-Phase Motor

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2000 product	1	1	1	1.732	1
	SF-JR					
Evaluated product	2012 product	1.034	0.991	0	1.432	1
	SF-PR					
Details of improvements		Curbed increase in materials usage	Optimized electrical design that enhances efficiency	No use of harmful substances specified in the EU RoHS Directive		
Environmental load factor: A		(1/Environmental load of new product)/ (1/Environmental load of standard product)			1.209	
Performance factor: B		(Added value of new product)/ (Added value of standard product)			1	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			1.209	

Environmental load factor

		Baseline product (2000 product)		Evaluated product	
M	(1) Weight of product	110.4	kg	114.1	kg
	Iron	94.5	kg	94.2	kg
	Copper	8.8	kg	12.7	kg
	Aluminum	6.8	kg	6.9	kg
	Resin (Recycled material)	0.23	kg	0.23	kg
	Resin (Non-recycled material)	0.0	kg	0.0	kg
	Others	0.0	kg	0.0	kg
	(2) Weight of recycled material	35.6	kg	36.0	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	35.6	kg	36.0	kg
(5) Consumption of virgin resources [(1) – (4)]	74.8	kg	78.1	kg	
(6) Recyclable weight (3R possible)	110.4	kg	114.2	kg	
(7) Non-recyclable weight [(1) – (6)]	0.0	kg	0.0	kg	
E	Power consumption during annual operation (E1)	-	kWh	-	kWh
	Power consumption in annual standby state (E2)	-	kWh	-	kWh
	Total (Annual power consumption)	49,020	kWh	48,600	kWh
T	Lead usage in solder (T1)	0	g		g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	1	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g

HCFC refrigerant ²	0	g	0	g
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*Data for a representative model.

Performance factor

Example of improvements in performance/service life	Performance/Service life index
Performance factor	

Environment – Information & Communication Systems


In information and communication systems, Mitsubishi Electric provides solutions based on advanced IT technology, and supports customers' environmental activities by helping them to gather, analyze, and apply environmental burden information.

 **Optical Network Unit**

 **Mitsubishi Logistics
Information System: Dr. Logis**

 **Integrated Environmental
Information System**

 **Environmentally Resistant
Wide-Area Optical Ethernet
Switch**

 **WDM Optical Transmission
Equipment**

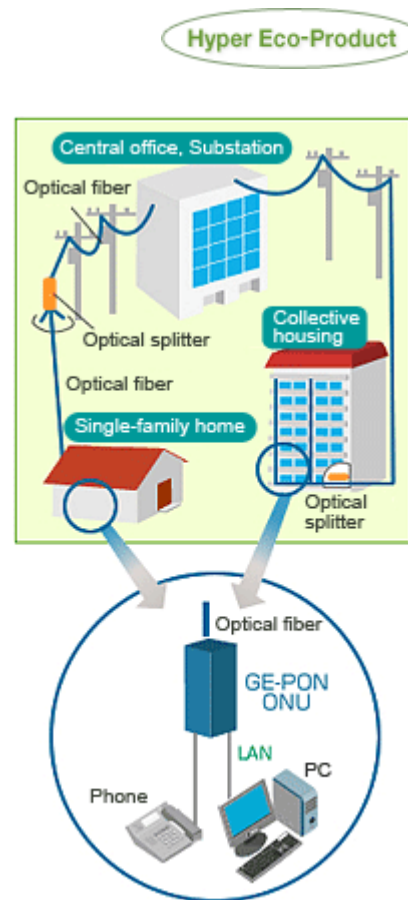
 **Information Equipment
Recycling Service**

Optical Network Unit GE-PON ONU

Factor 24.11: Performance Factor 6.67:
Environmental Load Factor 3.62

Provides high-speed broadband over optical fiber

The GE-PON system makes high-speed broadband over optical fiber to the home possible by connecting and terminating optical fiber installed in the home. Using passive optical network, or PON, technology, one strand of optical fiber can be shared by up to 64 users, which reduces device size and cuts power consumption. The system provides a pleasant Internet experience with speeds as high as 1 Gbps.



Reasons for Hyper Eco-Product Certification

- Significant electricity consumption reduction achieved by reducing the number of parts compared to previous equipment
- Factor rating of 2 or more
- Lead-free

Detailed environmental data

GE-PON ONU

M Materials: Effective use of resources

- Virgin resource consumption reduced substantially by making the product smaller and eliminating metal materials.
Iron: 0.046kg→0kg
Aluminum: 0.306kg→0kg
Plastic: 0.5kg→0.133kg

E Energy: Efficient use of energy

- Eliminating parts with high power consumption (FPGA) reduced power consumption by 65% compared to the previous Mitsubishi Electric product.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Complies with Europe's RoHS Directive
- Uses lead-free solder

Optical Network Unit

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	1990 product	1	1	1	1.73	1
	ATM-DSU					
Evaluated product	2007 product	0.31	0.36	0	0.48	1.1
	GEPON-ONU					
	Details of improvement	Reduced volume of materials used (plastics, etc.)	Eliminating parts with high power consumption (FPGA) reduced power consumption	Uses lead-free solder		Performance factor evaluated based on transmission speed. ATM-DSU : 150 Mbps; GEPON: 1Gbps
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			3.62	
Performance factor: B		(Added value of new product)/(Added value of standard product)			6.67	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			24.11	

Environmental load factor

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	0.85	kg	0.22	kg
	Iron	0.05	kg	0.00	kg
	Copper	0.00	kg	0.00	kg
	Aluminum	0.31	kg	0.00	kg
	Resin (Recycled material)	0.00	kg	0.00	kg
	Resin (Non-recycled material)	0.50	kg	0.13	kg
	Others	0.00	kg	0.09	kg
	Reduced weight after conversion into identical function ¹		kg	-0.70	kg
	(2) Weight of recycled material	0.07	kg	0.00	kg
	(3) Weight of reused parts	0.00	kg	0.00	kg
	(4) Weight of 3R material [(2) + (3)]	0.07	kg	0.00	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.78	kg	0.22	kg
	(6) Recyclable weight (3R possible)	0.60	kg	0.10	kg
(7) Nonrecyclable weight [(1) – (6)]	0.25	kg	0.12	kg	
E	Power consumption during annual operation (E1)	7.08	kWh	2.65	kWh
	Power consumption in annual standby state (E2)	77.89	kWh	27.38	kWh
	Total (Annual power consumption)	84.97	kWh	30.03	kWh

Lead usage in solder (T1)	2.70	g	0.00	g
Cadmium usage (T2)	0.00	g	0.00	g
Mercury usage (T3)	0.00	g	0.00	g
Hexavalent chromium usage (T4)	0.00	g	0.00	g
PBB usage (T5)	0.00	g	0.00	g
PBDE usage (T6)	0.00	g	0.00	g
HCFC refrigerant ²				
Others				
Total				

Factors with 3R viewpoint: Addition method

		Quantitative data				Standard product	Evaluated product
		Standard product	(Unit)	Evaluated product	(Unit)		
M	2 x Weight -3R-3R possible [(5) + (7)]	-	kg	-	kg	1.00	0.31
E	Reduction in energy consumption	-	kWh	-	kWh	1.00	0.36
T	Reduction in hazardous substances	-	g	-	g	1.00	0.00
Environmental load (MET resultant value)						1.73	0.48
Environmental load factor						3.62	

- 1 The weight of the function absent in the standard product, which cannot be expressed as an influence on environmental load or as the added value of the product. It is the weight of the part not subject to evaluation. (Oxygen adding function and ventilation function)
- 2 Evaluation after HCFC refrigerant is added to the environmentally hazardous substances.

Performance factor

Example of improvement of performance/life	Performance/life index
Faster transmission speed (150 Mbps → 1 Gbps)	6.67
Performance factor	6.67

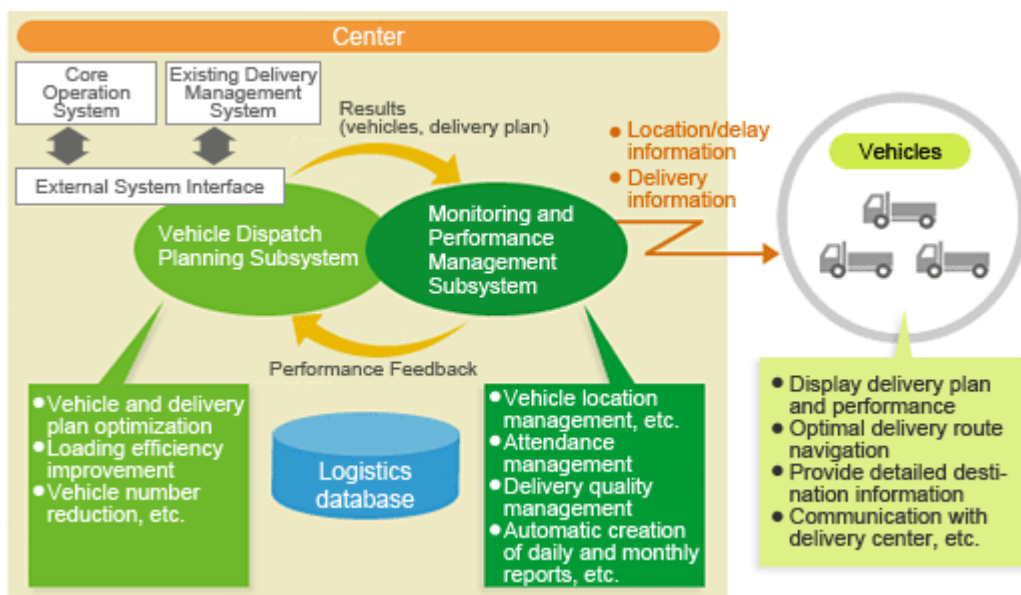


Environment – Mitsubishi Logistics Information System: Dr. Logis

Information & Communication: Mitsubishi Logistics Information System: Dr. Logis

Dr. Logis is a system that supports optimal, realistic vehicle dispatch planning for distribution. It reduces the number of vehicles, distance traveled, and time required when delivering the same quantities under the same conditions.

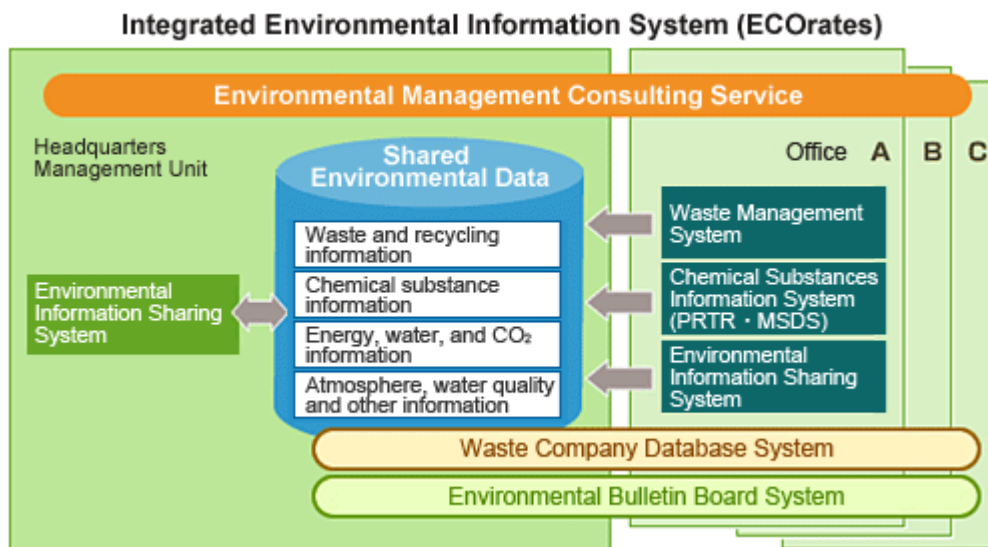
Trucks burning diesel, gasoline, or other fossil fuels are used in delivery work. Reducing distance and time traveled by minimizing the number of vehicles used and optimizing distribution routes for cases in which the same quantities are being delivered reduces fuel usage and, ultimately, NOx and CO2 emissions.



Environment – Integrated Environmental Information System

Information & Communication: Integrated Environmental Information System (EORates)

EORates is an information system that, when applied in information sharing and communication, promotes legal compliance, risk avoidance, and environmentally conscious management through the introduction of IT to environmental management. EORates is comprised of three subsystems: the Waste Management System, Environmental Information Sharing System and Chemical Substances Information System.



M Materials: Effective use of resources

- Adding to our use of industrial waste management systems, we have taken steps that make it possible to manage all wastes generated, including general waste and materials with value. These measures allow us to determine volumes and relative percentages of recyclable and other valuable materials, and promote 3R (recycle, reuse, reduce) activities.

E Energy: Efficient use of energy

- The Chemical Substance Management System makes it possible to manage controlled substances by simplifying the work of determining amounts of PRTR Law and other controlled substances purchased and used, and assembling data on atmospheric and waterway emissions, and transfers. Furthermore, it helps to reduce chemical substance usage by making it possible to reference purchase data.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- The Environmental Information Sharing System makes it possible to gather environmental performance data on energy, paper, water, and other resource usage for group companies, including affiliates and overseas group members. Efficiency enhancement and usage reduction are aided by CO₂, fuel, and basic unit data conversions. This system also simplifies preparation of data for inclusion in environmental and CSR reports.

Environment – Environmentally Resistant Wide-Area Optical Ethernet Switch

Environmentally Resistant Wide-Area Optical Ethernet Switch MELNET-ES1100

A Slim, Compact Optical Ethernet Switch Suitable for Outdoor Installation

MELNET-ES1100 is ideal for network configurations requiring environmental resistance and large capacity, such as onsite facility surveillance of roads, rivers, dams, erosion control hotspots, ports and harbors, railways, toll roads and other infrastructure, as well as CCTV video coverage equipment.



Optical Ethernet interfaces (1000BASE-X and 100BASE-FX) are mounted with a total of four ports. For each port, a module can be selected based on transmission distance, facilitating long-distance transmission from several kilometers up to 80 kilometers.

To enable outdoor storage (from -10°C to 55°C), MELNET-ES1100's slim, compact 1U rack size (44mm) can be stored within both JIS and 19-inch racks. In addition, its fanless design eliminates the need for fan replacement or fan filter cleaning. This product acquired the Eco-Leaf environmental label (conforming to the ISO Type III framework).



No.DG-10-001

[Detailed information on the Eco-Leaf environmental label](#)

M Materials: Effective use of resources

- A redesigned heat dissipation mechanism realizes fewer parts and reduces weight by 30% compared to conventional models.

E Energy: Efficient use of energy

- Adoption of energy-efficient large-scale integration (LSI) and other components has reduced power consumption by 14% compared with conventional models.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- MELNET-ES1100 complies with lead-free phase 1 standards (no lead used in surface treatment of circuit boards and mounting solder) and features vastly reduced overall lead content.

WDM Optical Transmission Equipment 10G x 80 Wavelength ROADM MF-800 GWR

Factor: 31.409
Performance Factor: 21.034
Environmental Impact Factor: 1.496

Hyper Eco-Product

Space-Saving Design Realizing 420Gbit/s in One Bay

Mitsubishi Electric's Reconfigurable Optical Add-Drop Multiplexer (ROADM) is a type of wavelength-division multiplexing (WDM) transmission device that features large-volume data transmission of 10Gbit/s x 80 wavelengths (800Gbit/s). Thanks to its sophisticated circuit design and device integration, its single bay can accommodate 42 wavelengths (420Gbit/s) with ROADM and amplification function cards, resulting in substantial reductions in installation space. It is also capable of configuring Add/Drop/Thru for any wavelength from supervisor control terminals installed in operation centers. In addition, our line-up includes products that accommodate large-capacity transmission of 40 and 100Gbit/s per wavelength.

These features realize a ROADM that provides optimal solutions for network reconstruction according to relocation of facilities or traffic density.



Reasons for Hyper Eco-Product Certification

- Factor 2 or above

Detailed environmental data

MF-800GWR

M Materials: Effective use of resources

- Use of suitable materials and reduced coating to enhance degradability and recyclability.

E Energy: Efficient use of energy

- Advanced components developed in-house successfully reduce the power consumption per single information bit to 4% of that in the year 2000.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Designed to comply with the EU RoHS Directive. While some products are already fully RoHS-compliant, we are currently working toward compliance for all products.

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	1999 product	1	1	1	1.732	1
	ATM-XC					
Evaluated product	2009 product	0.767	0.829	0.256	1.158	21
	MF-800GWR					
Details of improvement		Reduced coating of metallic components and enhanced degradability and recyclability	Reduced energy consumption to 4% of fiscal 2000 values (1Gbit/s equivalent) through large-scale integration of electrical circuits	Designed to EU RoHS Directive standards		Items for consideration: Performance ratio = 21 times ¹ ATM : 156M × 128ch : 10G × 42ch
Environmental load factor		(1/Environmental load of new product) / (1/Environmental load of standard product)			1.496	
Performance factor		(Added value of new product) / (Added value of standard product)			21.034	
Factor X		(Added value/ Environmental load of new product) / (Added value/ Environmental load of standard product)			31.409	

¹ Product value is calculated as the performance factor per rack.
 New product transmission volume/Standard product transmission volume = (10Gbit/s × 42ch)/(156Mbit/s × 128ch) = 21

Environmental load factor

		Baseline product (1999 product equivalent)		Evaluated product	
M	(1) Weight of product	307	kg	300	kg
	Iron	252.0	kg	216.7	kg
	Copper	-	kg	-	kg
	Aluminum	-	kg	-	kg
	Resin (Recycled material)	-	kg	-	kg
	Resin (Non-recycled material)	-	kg	83.2	kg
	Others	55.0	kg	0.0	kg
	(2) Weight of recycled material	88.2	kg	75.8	kg
	(3) Weight of reused parts	-	kg	-	kg
	(4) Weight of 3R material [(2) + (3)]	88.2	kg	75.8	kg
	(5) Consumption of virgin resources [(1) - (4)]	218.8	kg	224.1	kg
	(6) Recyclable weight (3R possible)	75.6	kg	216.7	kg
	(7) Non-recyclable weight [(1) - (6)]	231.4	kg	83.2	kg
Power consumption during annual operation					

(E1)	38,544	kWh	31,974	kWh
Power consumption in annual standby state (E2)	38,544	kWh	31,974	kWh
Total (Annual power consumption)	38,544	kWh	31,974	kWh
Lead usage in solder (T1)	567	g	0.179	g
Cadmium usage (T2)	-	g	0.01	g
Mercury usage (T3)	-	g	0	g
T Hexavalent chromium usage (T4)	-	g	0.17	g
PBB usage (T5)	-	g	0	g
PBDE usage (T6)	-	g	0	g
HCFC refrigerant	0		0	

Performance factor

Example of improvement of performance/life	Performance/life index
Performance factor per rack New product transmission volume/Standard product transmission volume = (10Gbit/s × 42ch)/(156Mbit/s × 128ch) = 21	21
Performance factor (Average)	21



Environment – Information Equipment Recycling Service

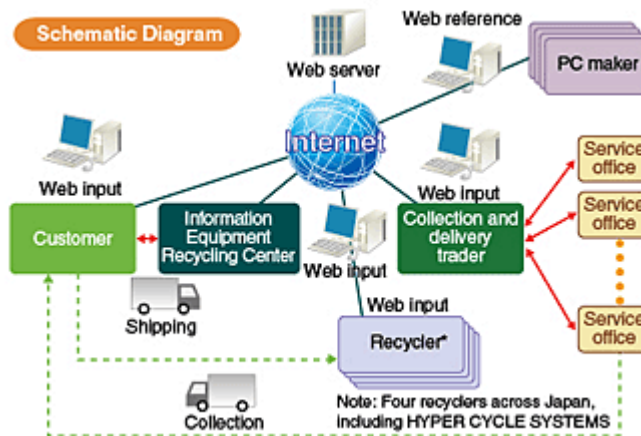
Information Equipment Recycling Service

Simple Disposal of Information Equipment

This recycling service has a Web-based menu, realizing user-friendly collection and recycling of end-of-lifecycle information and communications equipment. Customers can request estimates, place orders and monitor progress of the service online.



Information Equipment Recycling Service Website (Japanese language only)



M Materials: Effective use of resources

- As various materials are used in equipment, we select the recycling process best suited to each type of device. Processes primarily include disassembling, crushing and separating by hand. In addition, techniques used in the crushing and separation processes yield high-grade steel and copper, supporting highly efficient recycling.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- In order to avoid soil, water and air pollution, there is no combustion or washing involved in the recycling process.

Note

Supporting Simple Disposal for Customers

When disposing of Mitsubishi Electric information equipment*, there is no need for customers to enter into contracts with multiple collection and delivery traders or waste disposal organizations. The customer also does not need to keep a record of or provide a manifest form (document needed for recycling).

* Mitsubishi Electric information equipment is defined as any device manufactured by Mitsubishi Electric Corporation and Mitsubishi Electric Information Technology Corporation shown in the table below.

Potential Equipment List

Type	Equipment
Personal computers	■ Desktop computers ■ Notebook computers
Display equipment	■ CRT displays ■ Liquid-crystal displays
Workstations	■ Server workstations (including office computer/mainframe)
External storage devices	■ Hard disk units ■ Floppy disk units ■ MO disk units ■ Tape devices
I/O devices	■ Printers ■ Scanners ■ Terminal adapters ■ Modems ■ POS devices ■ Facsimile machines ■ Routers ■ Surveillance camera systems
Power supply units	■ Uninterruptible power supply devices

Environment – Electronic Devices

In the area of electronic devices, we are working to make critical electronic devices more energy efficient and reduce the use of lead and other controlled substances.

 **DIIPM Module**

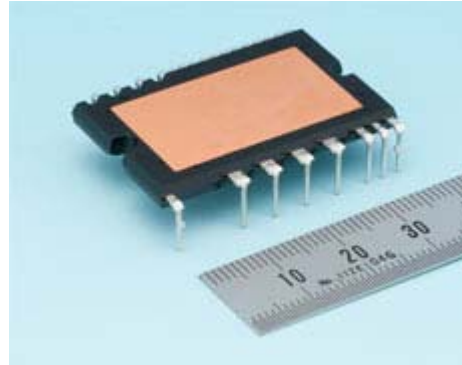
 **Laminated Bus Bar**

 **Contact Image Sensor**

Super Mini DIIPM Ver. 5 Series PS219B4

Factor: 2.531; Performance Factor: 1.50;
Environmental Load Factor: 1.687

Dual Inline Package Intelligent Power Modules (DIIPMs) are used to drive inverters for home appliances and industrial motors.



Detailed environmental data

PS219B4

M Materials: Effective use of resources

- Use of insulation structure with high heat dissipation to suppress temperature increases in power chips, enabling a smaller package and greatly reducing (by approx. 40% compared to previous products) the space needed for mounting on the printed circuit board.

E Energy: Efficient use of energy

- Reduced system power consumption through integration of a full-gate CSTBT™*, an advanced insulated gate bipolar transistor (IGBT) developed by Mitsubishi Electric.
* CSTBT: Carrier Stored Trench Gate Bipolar Transistor.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Totally lead-free products achieved through introducing lead-free process for soldering power chips and use of lead-free plating for the outer terminals (RoHS compliant).

Note

Winner of Manufacturing Award at the 52nd Okochi Prize Ceremony

The DIIPM was awarded the Okochi Memorial Foundation Manufacturing Prize at the 52nd (2006) Okochi Prize Ceremony held on March 14, 2006 for the “development and production of a transfer-mold intelligent power module.” The selection committee praised the development of the modules which unify

multiple power chips to incorporate inverter power circuits and controller ICs while using a transfer-mold package with high reliability and low cost.



Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2002 product	1	1	1	1.732	1
	PS21564					
Evaluated product	2012 product	0.415	0.939	0	1.027	1.5
	PS219B4					
Details of improvement		Miniaturization of package	Introduction of full-gate CSTBT™	Completely lead-free product (both external plating and interior)		Details: High heat dissipation structure realizes reduced heat resistance
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.687	
Performance factor: B		(Added value of new product)/(Added value of standard product)			1.500	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.531	

Environmental load factor

		Baseline product (2002 product equivalent)		Evaluated product	
M	(1) Weight of product	0.02	kg	0.0083	kg
	Iron	0	kg	0	kg
	Copper	0	kg	0	kg
	Aluminum	0	kg	0	kg
	Resin (Recycled material)	0	kg	0	kg
	Resin (Non-recycled material)	0	kg	0	kg
	Others	0	kg	0	kg
	(2) Weight of recycled material	0	kg	0	kg
	(3) Weight of reused parts	0	kg	0	kg
	(4) Weight of 3R material [(2) + (3)]	0	kg	0	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.02	kg	0.0083	kg
	(6) Recyclable weight (3R possible)	0	kg	0	kg
	(7) Non-recyclable weight [(1) – (6)]	0.02	kg	0.0083	kg
E	Power consumption during annual operation (E1)	98	kWh	92	kWh
	Power consumption in annual standby state (E2)	0	kWh	0	kWh
	Total (Annual power consumption)	98	kWh	92	kWh
	Lead usage in solder (T1)	0.21	g	0	g
	Cadmium usage (T2)	0	g	0	g

Mercury usage (T3)	0	g	0	g
Hexavalent chromium usage (T4)	0	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0	g	0	g

Performance factor

Example of improvement of performance/life	Performance/life index
Reduced heat resistance through adoption of new high heat dissipation structure (Standard: Max. 4.5 → 3.0°C/W)	1.5

Laminated Bus Bar (Large Current Circuit Board)

Factor: 2.45

Performance Factor: 2

Environmental Impact Factor: 1.22

Improved Inverter Power Conversion Efficiency and Reduced Weight through use of Aluminum Materials

The laminated bus bar, a large current circuit board, achieves high-speed operation by preventing electrical surges during high-speed switching. The board is used for power semiconductor devices such as IGBTs¹ and IPMs².

Reduced inductance makes it possible for the inverter's main circuit wiring to be completely snubberless. Reduced snubber loss results in improved power conversion efficiency.

Aluminum, rather than copper, is used as the unit's main material, making it more lightweight.



*1 IGBT: Insulated Gate Bipolar Transistor
A semiconductor device used for power control applications

*2 IPM: Intelligent Power Module
A semiconductor device used for ON-OFF switching that contains circuitry for control and protection in a single package

Detailed environmental data

Laminated bus bar

M Materials: Effective use of resources

- Achieved a 70% weight reduction by using aluminum rather than copper as the main material

E Energy: Efficient use of energy

- Completely snubberless inverter main circuit wiring
- Significantly improved power conversion efficiency

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminates six substances indicated by the RoHS Directive (non-applicable).

Laminated Bus Bar

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Baseline product*1	2005 product	1	1	1	1.732	1
Evaluated product*2	2012 product	1	1	0	1.414	1
Details of improvement		Reduced mass (copper → aluminum)	Improved power conversion through inductance reduction	Eliminated six substances indicated by the RoHS Directive		
Environmental impact factor		(1/Environmental impact of new product) / (1/Environmental impact of standard product)			1.22	
Performance factor		(Added value of new product) / (Added value of standard product)			2	
Factor X: Environmental impact factor × Performance factor		(Added value, environmental impact of new products) / (Added value, environmental impact of standard product)			2.45	

*1 Product evaluated as "aluminum power conversion equipment application laminated bus bar"
Comparison assumption based on "same bus bar application made from copper" as benchmark product.

Environmental Impact Factor

		Baseline product (2005 product equivalent)		Evaluated product	
M	(1) Weight of product	6.6	kg	2.2	kg
	Iron	-	kg	-	kg
	Copper	6.5	kg	-	kg
	Aluminum	-	kg	2.1	kg
	Resin (Recycled material)	-	kg	-	kg
	Resin (Non-recycled material)	0.1	kg	0.1	kg
	Others	-	kg	-	kg
	(2) Weight of recycled material	0.0	kg	0.0	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	0.0	kg	0.0	kg
(5) Virgin resource consumption [(1) – (4)]	6.5	kg	2.2	kg	
(6) Recyclable weight (3R possible)	6.5	kg	2.1	kg	
(7) Nonrecyclable weight [(1) – (6)]	0.1	kg	0.1	kg	
E	Power consumption during annual operation (E1)	*2	kWh	*2	kWh
	Power consumption in annual standby state (E2)	*2	kWh	*2	kWh
	Total (Annual power consumption)	*2	kWh	*2	kWh
	Lead usage in solder (T1)	0	g	0	g
	Cadmium usage (T2)	0	g	0	g

Mercury usage (T3)	0	g	0	g
Hexavalent chromium usage (T4)	0	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0		0	

*2 Power consumption is not indicated because of differences among machines installed in end-user products.

Performance factor

Example of improvement of performance/life	Performance/life index
Achieved snubber elimination in protective power semiconductor device through improved inductance characteristics.	1
Reduced weight by switching from copper to aluminum materials (reduced weight to 1/3)	3
Performance factor (average)	2

Contact Image Sensor UD2F200AX

Factor: 2.414; Performance Factor: 1.50;
Environmental Load Factor: 1.61

Same High Performance with a More Compact and Energy-Efficient Design

Contact image sensors are used in bill validators found in ATMs and other banking terminals. This particular contact image sensor not only achieves the required speed and performance standards demanded by the market, but it can also be customized to user specifications, making it ideal for a wide range of product applications around the world.



Detailed environmental data

UD2F200AX

M Materials: Effective use of resources

- More compact (volume reduced 52%) and 38% lighter than conventional sensors.

E Energy: Efficient use of energy

- Power consumption reduced by 44% compared to conventional contact image sensors owing to use of our originally developed integrated circuits (ICs) (application-specific IC/sensor IC).

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Compliant with the EU RoHS Directive.

Contact Image Sensor

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2001 product	1	1	1	1.732	1
	UA2B200AX					
Evaluated product	2012 product	0.871304	0.5615	0.288675	1.076	1.5
	UD2F200AX					
Details of improvement		Use of plastic housing and integrated base plates (reduced weight)	Reduced power consumption of IC devices	No use of substances specified in the RoHS Directive		Details: Increased read rate
Environmental load factor: A		(1 / Environmental load of new product) / (1 / Environmental load of standard product)			1.610	
Performance factor: B		(Added value of new product) / (Added value of standard product)			1.5	
Factor X: AxB		(Added value of new product / Environmental load of new product) / (Added value of standard product / Environmental load of standard product)			2.414	

Environmental load factor

		Baseline product (2001 product equivalent)		Evaluated product	
M	(1) Weight of product	117.8	kg	81.0	kg
	Iron	2.0	kg	0.0	kg
	Copper	0.0	kg	0.0	kg
	Aluminum	70.4	kg	0.0	kg
	Resin (Recycled material)	0.0	kg	29.1	kg
	Resin (Non-recycled material)	8.4	kg	11.5	kg
	Others	50.4	kg	40.4	kg
	(2) Weight of recycled material	0.0	kg	29.1	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	0.0	kg	29.1	kg
	(5) Consumption of virgin resources [(1) – (4)]	117.8	kg	51.9	kg
	(6) Recyclable weight (3R possible)	0.0	kg	0.0	kg
	(7) Non-recyclable weight [(1) – (6)]	117.8	kg	81.0	kg
E	Power consumption during annual operation (E1)	3.00	kWh	1.68	kWh
	Power consumption in annual standby state (E2)	0	kWh	0	kWh
	Total (Annual power consumption)	9.00	kWh	5.05	kWh
	Lead usage in solder (T1)	2	g	0	g
	Cadmium usage (T2)	0	g	0	g

Mercury usage (T3)	0	g	0	g
Hexavalent chromium usage (T4)	0.05	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	0	g		g

Performance factor

Example of improvement of performance/life	Performance/life index
Increased read rate (product performance speed)	1.5

Environment – Home Appliances

In home appliances, we're developing and introducing various products that are energy efficient and make life more comfortable.

NOTE: Many of the products shown on these pages are for the Japanese market only.

 **LED Lighting**

 **Jet Towel Hand Dryers**

 **Room Air Conditioners**

 **Refrigerator**

 **Photovoltaic Module**

 **Photovoltaic Inverter**

 **Eco Cute for Household Use**

 **Eco Cute for Commercial Applications**

 **Ventilator**

 **Energy Recovery Ventilator for Commercial Use**

 **Lossnay Central Ventilator System**

LED Lighting— erise LED Downlight Class 150 EL-D1411N/3W

Factor: 8.246

Performance Factor: 3.49

Environmental Impact Factor: 2.363

Diffusion light used to brighten open spaces. This eco-conscious product offers energy savings and a long operating life. The erise LED Downlight Class 150 EL-D1411N/3W delivers the same brightness as our conventional fluorescent downlight (FHT32W) while reducing energy consumption by approximately 38%. With an operating life of 60,000 hours, the need to replace lamps has been substantially reduced.



Detailed environmental data

EL-D1411N/3W

M Materials: Effective use of resources

- Operating life of 60,000 hours is approximately six times that of conventional fluorescent downlights, requiring fewer lamp replacements, and helping to substantially reduce waste.

E Energy: Efficient use of energy

- High-efficiency reflector and improvements in power source efficiency contribute to a high 81.8 lm/W intrinsic energy consumption efficiency
- An approximate 38% decrease in energy consumption compared with conventional fluorescent downlights (FHT32W) significantly reduces CO₂

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Compliant with the European RoHS directive
- Mercury-free light source

LED Lighting

Summary data

		Environmental Impact				Product Value
		M: Effective Use of Resources	E: Efficient Use of Energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline Product	Manufactured in 1990	1	1	1	1.732	1
	BDF63011A(FHT32)					
Evaluated Product	Manufactured in 2011	0.593	0.43	0	0.733	3.49
	EL-D1411N/3W					
Improvements		Reduction in light mass	Contributes to the promotion of the highest energy conservation standards in the industry	Eliminates the use of substances that fall within the scope of the European RoHS directive		
Environmental Impact Factor		(1/Environmental impact of new product)/(1/Environmental impact of baseline product)			2.363	
Performance factor		(Value added of new product)/(Value added of baseline product)			3.49	
Factor X: Performance Factor × Environmental Impact Factor		(Value added of new product/Environmental impact of new product)/(Value added of baseline product/Environmental impact of baseline product)			8.246	

*The product evaluated has essentially the same light (optics) specifications as downlights that use light sources equivalent to the conventional FHT32W.

1. The evaluated product (EL-D1411N/3W) and the baseline product (BDF63011A FHT32W) have effectively the same light flux. The operating light source life of the evaluated product (LED) is 60,000 hours compared with 10,000 hours for the baseline product (FHT32W).
2. While the light source of the baseline product (FHT32W) is within the threshold, it contains trace elements of mercury (consistent with RoHS). Details not presented in the table.
3. Annual operating time for both the baseline and evaluated products set at 3,000 hours.

Environmental Impact Factor

	Baseline Product (Around 1990)		Evaluated product		
M	(1) Weight of product	0.9462	kg	0.8760	kg
	Iron	0.3369	kg	0.1965	kg
	Copper	0.0000	kg	0.0000	kg
	Aluminum	0.2396	kg	0.4456	kg
	Resin (Recycled material)	0.0000	kg	0.0000	kg
	Resin (Non-recycled material)	0.0051	kg	0.1549	kg
	Others	0.0365	kg	0.0760	kg
	(2) Weight of recycled material	0.1610	kg	0.1422	kg
	(3) Weight of reused parts	0.0000	kg	0.0000	kg
	(4) Weight of 3R material [(2) + (3)]	0.1610	kg	0.1422	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.7852	kg	0.7338	kg

	(6) Recyclable weight (3R possible)	0.5765	kg	0.6539	kg
	(7) Nonrecyclable weight [(1) – (6)]	0.3697	kg	0.2221	kg
E	Power consumption during annual operation (E1)	93.0000	kWh	57.6000	kWh
	Power consumption in annual standby state (E2)	0.0000	kWh	0.0000	kWh
	Total (Annual power consumption)	93.0000	kWh	57.6000	kWh
T	Lead usage in solder (T1)	0.0000	g	0.0000	g
	Cadmium usage (T2)	0.0000	g	0.0000	g
	Mercury usage (T3)	0.0000	g	0.0000	g
	Hexavalent chromium usage (T4)	0.0000	g	0.0000	g
	PBB usage (T5)	0.0000	g	0.0000	g
	PBDE usage (T6)	0.0000	g	0.0000	g

Performance factor

Examples of Performance and Operating Life Improvement	Performance and Operating Life Index
Light source operating life Baseline product 10,000h, Evaluated product 60,000h	6
Light source efficiency (lm/W) Baseline product 2200/31=71.0 Evaluated product 1570/12.9=81.8 Average color rendering index Ra Baseline product 85 Evaluated product 70	0.986
Performance factor	3.49

Jet Towel Hand Dryers JT-SB116KN Series

Factor: 3.884
Performance Factor: 1.435
Environmental Load Factor: 2.707

Eco-Conscious Product with Long Service Life and Low Power Consumption

JT-SB116KN Series Jet Towel hand dryers use a new arc-shaped “wave nozzle” and operate with low power consumption and low noise while eliminating the need for paper towels.



Detailed environmental data

JT-SB116KN

M Materials: Effective use of resources

- More compact and lighter through optimal layout of components.
- Brushless DC motor has a long service life of seven years at up to 1,000 uses per day.

E Energy: Efficient use of energy

- Low power consumption and low noise through the use of a newly developed “wave nozzle.”

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of the six hazardous substances specified in the EU RoHS Directive.

Jet Towel Hand Dryers

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline Product	1991 product	1	1	1	1.732	1
	JT-16A					
Evaluated product	2010 product	0.61925157	0.16108381	0	0.64	1.435
	JT-SB116KN					
Details of improvement		Reduced size/weight	Improved drying efficiency	No use of substances specified in the EU RoHS Directive		Details: Increased drying efficiency; Reduced noise level
Environmental load factor: A		(1 / Environmental load of new product) / (1 / Environmental load of standard product)			2.707	
Performance factor: B		(Added value of new product) / (Added value of standard product)			1.435	
Factor X: AxB		(Added value of new product / Environmental load of new product) / (Added value of standard product / Environmental load of standard product)			3.884	

Environmental load factor

		Baseline product (1991 product equivalent)		Evaluated product	
M	(1) Weight of product	18.3	kg	10.2	kg
	Iron	12.9	kg	2.1	kg
	Copper	0.3	kg	0.3	kg
	Aluminum	0.4	kg	0.6	kg
	Resin (Recycled material)	0.0	kg	0.6	kg
	Resin (Non-recycled material)	4.4	kg	4.4	kg
	Others	0.4	kg	2.1	kg
	(2) Weight of recycled material	4.6	kg	1.5	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	4.6	kg	1.5	kg
(5) Consumption of virgin resources [(1) – (4)]	13.7	kg	8.7	kg	
(6) Recyclable weight (3R possible)	7.9	kg	3.9	kg	
(7) Non-recyclable weight [(1) – (6)]	10.4	kg	6.3	kg	
E	Power consumption during annual operation (E1)	533.3	kWh	118	kWh
	Power consumption in annual standby state (E2)	125.3	kWh	5.6	kWh
	Total (Annual power consumption)	658.7	kWh	124.8	kWh
T	Lead usage in solder (T1)	4.3	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g

Hexavalent chromium usage (T4)	0.015	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	-	g	-	g

Performance factor

Example of improvement of performance/life	Performance/life index
Drying time: 10 ⇒ 6s	1.67
Sound level: 65 ⇒ 56dB	1.2
Performance factor (average)	1.435

Room Air Conditioner ZW Series (Representative Model MSZ-ZW403S)

Factor: 2.645

Performance Factor: 1.13

Environmental Load Factor: 2.340

Optimal Comfort and Reduced Waste through Functions that Monitor People's Movements

ZW Series room air conditioners are equipped with two infrared sensors, "Eco Move Eye" and "Smart Eye," that monitor sensory temperature to ensure optimal operation. These air conditioners use a hybrid operating system that automatically controls temperature and airflow while monitoring the presence of people in the room in real-time. The air conditioner automatically switches to energy-saving mode when people leave the room, returns to full operation as people return, and switches off when people leave for an extended period. These original sensor technologies help to control air conditioning waste and deliver energy-saving benefits.



Detailed environmental data

MSZ-ZW403S

M Materials: Effective use of resources

- Development of original technologies that enable recycling of plastics used in home appliances. Three main plastics, polypropylene (PP), polystyrene (PS) and acrylonitrile-butadiene-styrene (ABS), which have previously proven to be difficult to recycle, can be recovered to a high degree of purity through crushing and separation processes. The recovered plastics are reused in plastic components of products, significantly increasing the usage rate of closed-loop recycled plastic.
- Our unique hydrophilic/hydrophobic coating that can be applied to both metals and plastic is used on parts of the heat exchanger and vents in the interior unit, effectively repelling hydrophilic contaminants, such as lint and dust, and hydrophobic contaminants, such as grease. This feature reduces the adhesion of contaminants to 1/10 the previous level. An automatic filter-cleaning function, combined with the energy savings and reduced deterioration that results from low internal contaminant levels contributes to a longer unit service life.

E Energy: Efficient use of energy

- Improved efficiency of key air conditioner components, such as the compressor, heat exchanger and fan motor, puts this unit at the top of its class industry-wide in terms of energy efficiency.
- Move Eye senses floor and wall temperatures, as well as people's locations and movements, and automatically adjusts the airflow direction and temperature according to the body temperatures of people in the room to maintain a high degree of comfort while delivering energy savings.
- Equipped with a function that provides energy-saving advice via the remote control, like reminders that the door is not closed, and a function that displays energy savings on the remote control to promote an energy-saving mindset in users.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of substances specified in the EU RoHS Directive, Japanese Industrial Standards (JIS) or J-Moss.

Room Air Conditioners

Summary data

		Environmental load				Value of product
		M : Effective utilization of resources	E : Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline Product	1990 product	1	1	1	1.732	1
	MSZ-4010S					
Evaluated product	2012 product	0.63	0.4	0	0.740	1.13
	MSZ-ZW403S					
Details of improvement			Power consumption in Standby mode: 0W			Evaluation items taken into consideration
Environmental load factor: A		(1 / Environmental load of new product) / (1 / Environmental load of standard product)			2.34	
Performance factor: B		(Added value of new product) / (Added value of standard product)			1.13	
Factor X: AxB		(Added value of new product / Environmental load of new product) / (Added value of standard product / Environmental load of standard product)			2.645	

Environmental load factor

		Baseline product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	64.0	kg	47.8	kg
	Iron	28.9	kg	21.2	kg
	Copper	8.9	kg	7.4	kg
	Aluminum	7.5	kg	6.3	kg
	Resin (Recycled material)	0	kg	2.1	kg
	Resin (Non-recycled material)	10.7	kg	7.7	kg
	Others	8.0	kg	4.9	kg
	(2) Weight of recycled material	12.5	kg	11.5	kg
	(3) Weight of reused parts	0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	12.5	kg	11.5	kg
	(5) Consumption of virgin resources [(1) – (4)]	51.5	kg	36.2	kg
	(6) Recyclable weight (3R possible)	49.9	kg	43.0	kg
	(7) Non-recyclable weight [(1) – (6)]	14.1	kg	4.8	kg
E	Power consumption during annual operation (E1)	3,206	kWh	1,272	kWh
	Power consumption in annual standby state (E2)	12	kWh	0	kWh
	Total (Annual power consumption)	3,218	kWh	1,272	kWh
	Lead usage in solder (T1)	25	g	0	g
	Cadmium usage (T2)	0	g	0	g

Mercury usage (T3)	0	g	0	g
Hexavalent chromium usage (T4)	2	g	0	g
PBB usage (T5)	0	g	0	g
PBDE usage (T6)	350	g	0	g
HCFC refrigerant	1,000	g	0	g

Performance factor

Example of improvement of performance/life	Performance/life index
Enhanced maximum heating capacity	1.16
Reduced power consumption with Move Eye (annual average: 40%)	1.1
Performance factor	1.13

Refrigerator MR-JX60W

Factor: 2.549

Smart, Stylish Design and Substantially Increased Capacity through use of Smart Cube, a New Slim Heat-Insulating Structure

Mitsubishi Electric's MR-JX60W refrigerator uses Smart Cube, a new slim heat-insulating structure which enables reduced thickness of doors and exterior panels while maintaining heat insulation performance. This innovation successfully balances the need for thinner installation widths and higher capacity with the need for energy-savings through use of original urethane foam technologies to reduce the thickness of urethane materials and through efficient use of vacuum insulation panels with excellent insulation properties.



Detailed environmental data

MR-JX60W

M Materials: Effective use of resources

- Development of original technologies that enable recycling of plastics used in home appliances. Three main plastics, polypropylene (PP), polystyrene (PS) and acrylonitrile-butadiene-styrene (ABS), which have previously proven to be difficult to recycle, can be recovered to a high degree of purity through crushing and separation processes. The recovered plastics are reused in plastic components of products, significantly increasing the usage rate of closed-loop recycled plastic.

E Energy: Efficient use of energy

- Each compartment is independently structured with its own temperature as well as door opening and closing sensors. This helps to increase efficiency as each compartment is refrigerated on an individual basis. In addition, the "Hybrid Defrost Heater" included in the condenser together with the "Pre-Frost System" increases defrosting time efficiency while promoting greater energy efficiency.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of the hazardous substances specified in the EU RoHS Directive or J-Moss, which forms part of the Japan Industrial Standards (JIS).

Refrigerator

Summary data

		Environmental load				Value of product
		M : Effective utilization of resources	E : Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	1998 product	1	1	1	1.732	1
	MR-M37S					
Evaluated product	2012 product	0.6625	0.1505	0	0.679	
	MR-JX60W					
Details of improvement						Evaluation items taken into consideration
Environmental load factor: A	(1/Environmental load of new product)/(1/Environmental load of baseline product)				2.549	
Performance factor: B	(Added value of new product) / (Added value of standard product)					
Factor X: AxB	(Added value of new product / Environmental load of new product) / (Added value of standard product / Environmental load of standard product)					

Environmental load factor

		Baseline product (1998 product equivalent)		Evaluated product	
M	(1) Weight of product	85.0	kg	117.0	kg
	Iron	39.0	kg	50.2	kg
	Copper	3.1	kg	4.6	kg
	Aluminum	0.7	kg	1.9	kg
	Plastics (Recycled material)	0.1	kg	3.9	kg
	Plastics (Non-recycled material)	38.0	kg	37.8	kg
	Others	3.1	kg	11.6	kg
	(2) Weight of recycled material	42.9	kg	60.6	kg
	(3) Weight of reused parts	0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	42.9	kg	60.6	kg
(5) Consumption of virgin resources [(1) – (4)]	42.1	kg	49.4	kg	
(6) Recyclable weight (3R possible)	42.9	kg	83.5	kg	
(7) Non-recyclable weight [(1) – (6)]	42.1	kg	26.5	kg	
E	Power consumption during annual operation (E1)	1,050	kWh	240	kWh
	Power consumption in annual standby state (E2)	-	kWh	-	kWh
	Total (Annual power consumption)	1,050	kWh	240	kWh
T	Lead usage in solder (T1)	6	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	4	g	0	g

PBB usage (T5)	0	g	0	g
PBDE usage (T6)	3.5	g	0	g
HCFC refrigerant	190	g	0	g

Performance factor

Example of improvement of performance / life	Performance / life index
Capacity coefficient (Calculated based on environmental load factor)	1.6129

Photovoltaic Module

PV-TJ235GA6 (for Europe) / PV-UJ235GA6 (for North America, Asia)

Factor: 1.73

Performance Factor: 1.865

Environmental Load Factor: 0.928

Using four bus bar cells with an expanded module size, we have achieved a maximum output of 235W per module.



Reasons for Eco-Product Certification

- Environmentally effective product
- Factor rating of 1.5 or more

Detailed environmental data

PV-TJ235GA6

M Materials: Effective use of resources

- Width of new bus bars used in the cell is half that of our previous bus bars, delivering greater efficiency without increasing the amount of material used.
- Optimized frame design approximately doubles the strength of our previous frame.

E Energy: Efficient use of energy

- Individual cell output improved by adopting four bus bar cells.
- Module size expanded to increase output per module.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Uses lead-free solder to lessen impact on the environment.

Note

1. By increasing the number of bus bars from two to four, the internal resistance in each PV cell has been reduced, increasing individual cell output by 3 percent compared to those used in our previous models.
* When comparing our 2-bus-bar cell.
2. The number of cells per module has also increased from 50 to 60. This increase, combined with the new four bus bar cells raised power by as much as 24%, compared to our previous models.
* When comparing our 190W model to the new 235W model.
3. The newly designed frame, which is approximately twice as strong as our previous frame, enables the module to pass the IEC61215 (2nd Ed.) static load test of 5400Pa despite the larger module size.

Photovoltaic Module

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Standard product	2001 product	1	1	1	1.732	1
	PV-MR101A					
Evaluated product	2010 product	1.58	1	0	1.866	1.865
	PV-TJ235GA6					
Details of improvement		Reduced weight to output ratio	Increased output per cell	Use of Lead-free solder		Power increase: 126w → 235w
Environmental impact factor		(1/Environmental impact of new product)/ (1/Environmental impact of standard product)			0.928	
Performance factor		(Added value of new product)/ (Added value of standard product)			1.865	
Factor X: Performance factor x Environmental impact factor		(Added value of new product/Environmental impact of new product)/(Added value of standard product/Environmental impact of standard product)			1.731	

Environmental Impact Factor

		Standard product		Evaluated product	
M	(1) Weight of product	12.6	kg	19.8	kg
	Iron	0.03	kg	0.06	kg
	Copper	0.16	kg	0.24	kg
	Aluminum	2.67	kg	4.19	kg
	Resin (Recycled material)	0.02	kg	0.13	kg
	Resin (Non-recycled material)	1.05	kg	2.42	kg
	Others	8.65	kg	12.8	kg
	(2) Weight of recycled material	0.53	kg	0.93	kg
	(3) Weight of reused parts	0.02	kg	0.13	kg
	(4) Weight of 3R material [(2) + (3)]	0.55	kg	1.06	kg
	(5) Consumption of virgin resources [(1) – (4)]	12.0	kg	18.8	kg
	(6) Recyclable weight (3R possible)	2.89	kg	4.4	kg
	(7) Nonrecyclable weight [(1) – (6)]	9.7	kg	15.4	kg
E	Power consumption during annual operation (E1)	1		1	
	Power consumption in annual standby state (E2)	0		0	
	Total (Annual power consumption)	1		1	
T	Lead usage in solder (T1)	36	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0.001	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g

Performance factor

Example of improvement of performance/life	Performance/life index
Power increase : 126W → 235W	1.865
Performance factor (average)	1.865

Photovoltaic (PV) Inverter PV-PNS04ATL-GER

Factor 2.33: Performance Factor 2.105:
Environmental Load Factor 1.107

Mitsubishi Electric PV inverters for photovoltaic power systems feature industry-class maximum power conversion efficiency of 96.2% and maximum input voltage of 700 volts.



Detailed environmental data

PV-PNS04ATL-GER

E Energy: Efficient use of energy

- Generated power is used effectively with 96.2% power conversion efficiency.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminated the use of the six substances specified by the EU's RoHS directive.

Note

Mitsubishi Electric has developed a new power module for PV inverters sold in Europe. The internal circuitry uses a new system called the "three level inverter system*" (patent pending), and the filter that adjusts the waveform of the outputted current uses a reactor made of a new material (ferrite core), which stands up to high output and produces minimal loss. Optimally controlling these components has resulted in an industry-class maximum power conversion efficiency of 96.2%.

*This method reduces loss by switching between high voltage, medium voltage and low voltage.



Cooling structure for long-term reliability and high efficiency.



Large-size displays, enhanced by multiple-indicators with green colored backlight.



Safety enclosure with dust-tight structure.

Photovoltaic Inverter

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Standard product	2002 product	1	1	1	1.732	1
	PV-PN04D					
Evaluated product	2007 product	1.307	0.859463604	0	1.564	1.47
	PV-PNS04ATL					
	Details of improvement		Achieved the improvement of the conversion efficiency	Uses lead-free solder board Complies with Europe's RoHS Directive		Details: Expanded input voltage range Expanded usage temperature range Water- and dust-resistant structure (IP41)
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.107	
Performance factor: B		(Added value of new product)/(Added value of standard product)			2.105	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.33	

Environmental load factor

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	13.210	kg	17.920	kg
	Iron	5.370	kg	10.950	kg
	Copper	1.590	kg	1.570	kg
	Aluminum	3.230	kg	1.320	kg
	Resin (Recycled material)	0.000	kg	0.000	kg
	Resin (Non-recycled material)	0.100	kg	0.400	kg
	Others	2.920	kg	3.680	kg
	Reduced weight after conversion into identical function ¹				
	(2) Weight of recycled material	2.652	kg	4.259	kg
	(3) Weight of reused parts	0.000	kg	0.000	kg
	(4) Weight of 3R material [(2) + (3)]	2.652	kg	4.259	kg
	(5) Consumption of virgin resources [(1) – (4)]	10.558	kg	13.662	kg
	(6) Recyclable weight (3R possible)	10.190	kg	13.840	kg
	(7) Nonrecyclable weight [(1) – (6)]	3.020	kg	4.080	kg
E	Power consumption during annual operation (E1)	544.5	kWh	376.2	kWh
	Power consumption in annual standby state (E2)	0.576	kWh	0.576	kWh
	Total (Annual power consumption)				

Lead usage in solder (T1)	12.000	g	0.000	g
Cadmium usage (T2)	0.000	g	0.000	g
Mercury usage (T3)	0.000	g	0.000	g
Hexavalent chromium usage (T4)	1.000	g	0.000	g
PBB usage (T5)	0.000	g	0.000	g
PBDE usage (T6)	0.000	g	0.000	g
HCFC refrigerant ²				
Others				
Total				

Factors with 3R viewpoint: Addition method

		Quantitative data				Standard product	Evaluated product
		Standard product	(Unit)	Evaluated product	(Unit)		
M	2 x Weight -3R-3R possible [(5) + (7)]	-	kg	-	kg	1	1.307
E	Reduction in energy consumption	-	kWh	-	kWh	1	0.859
T	Reduction in hazardous substances	-	g	-	g	1	0
Environmental load (MET resultant value)						1.732	1.564
Environmental load factor						1.107	

- 1 The weight of the function absent in the standard product, which cannot be expressed as an influence on environmental load or as the added value of the product. It is the weight of the part not subject to evaluation. (Oxygen adding function and ventilation function)
- 2 Evaluation after HCFC refrigerant is added to the environmentally hazardous substances.

Performance factor

Example of improvement of performance/life	Performance/life index
Expanded input voltage range	2.085
Expanded usage temperature range	2.125
Performance factor	2.105

Eco Cute (Heat Pump Water Heater) for Household Use SRT-HP46W7

Factor: 2.891
Performance Factor: 2
Environmental Load Factor: 1.446

Towards a Smart Hot-Water Supply System

Mitsubishi Electric Eco Cute extracts heat energy from the surrounding air and uses it to heat water to enable energy savings of one-third compared to our conventional electric water heaters. In addition, Eco Cute realizes cost savings through support for electricity use when demand is off-peak such as during the night.



Detailed environmental data

SRT-HP46W7

M Materials: Effective use of resources

- Fewer parts used in the hot water tank unit and use of plastic piping components to realize weight reductions.
- Reduced weight and size of the heat pump unit owing to a revamped heat exchanger and simplified internal configuration.
- Packaging materials reduced through use of cardboard packaging.

E Energy: Efficient use of energy

- Improved heating efficiency through a smart heating control system that bases actions on past hot-water usage data.
- Improved hot-water supply efficiency through system controls that use hot-water supply assistance and heat-pump heat retention.
- Improved heat-retention efficiency through the use of expanded polystyrene (EPS) insulating materials for the hot-water storage tank.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of the hazardous substances specified in the EU RoHS Directive (use of lead-free solder boards, trivalent chrome plating, etc.).

Eco Cute for Household Use

Summary data

		Environmental load				Value of product
		M : Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	1990 product	1	1	1	1.732	1
	SRT-4661F					
Evaluated product	2012 product	1.17	0.24	0	1.198	2
	SRT-HP46W7					
Details of improvement						
Environmental load factor: A		(1/Environmental load of new product) / (1/Environmental load of baseline product)			1.446	
Performance factor: B		(Added value of new product) / (Added value of standard product)			2	
Factor X: AxB		(Added value of new product / Environmental load of new product) / (Added value of standard product / Environmental load of standard product)			2.891	

Environmental load factor

		Baseline product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	104.0	kg	120.0	kg
	Iron	83.7	kg	92.2	kg
	Copper	13.1	kg	9.8	kg
	Aluminum	0.0	kg	4.6	kg
	Resin (Recycled material)	0.0	kg	0.0	kg
	Resin (Non-recycled material)	0.6	kg	5.4	kg
	Others	6.6	kg	8.0	kg
	(2) Weight of recycled material	30.9	kg	34.3	kg
	(3) Weight of reused parts	0.0	kg	0.0	kg
	(4) Weight of 3R material [(2) + (3)]	30.9	kg	34.3	kg
(5) Consumption of virgin resources [(1) – (4)]	73.1	kg	85.7	kg	
(6) Recyclable weight (3R possible)	97.4	kg	112.0	kg	
(7) Non-recyclable weight [(1) – (6)]	6.6	kg	8.0	kg	
E	Power consumption during annual operation (E1)	68,651	kWh	16,207	kWh
	Power consumption in annual standby state (E2)	-	kWh	-	kWh
	Total (Annual power consumption)	-	kWh	-	kWh
T	Lead usage in solder (T1)	2.4	g	0	g
	Cadmium usage (T2)	0	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0	g	0	g

PBB usage (T5)	0	g	0	g
PBDE usage (T6)	0	g	0	g
HCFC refrigerant	-	g	-	g

Eco Cute (Heat Pump Water Heater) for Commercial Applications QAHV-N560B

Factor: 1.77

Performance Factor: 1.00*

Environmental Impact Factor: 1.77

* No performance factor evaluation for this product.

Hot Water Supply that Enhances Ease of Living

With a newly developed inverter-type scroll CO₂ compressor, the QAHV-N560B achieves a COP rating of 4.1 and significantly reduces hot water supply running costs. The CO₂ heat pump and inverter capacity control technologies facilitate an optimum hot water output of up to 90°C.

Received 10th Electric Load Leveling System Award Received Ministry of Economy, Trade and Industry, Agency for Natural Resources and Energy Director-General's Prize



Detailed environmental data

QAHV-N560B

M Materials: Effective use of resources

- Heat storage is carried out during nighttime using the hot water tank, facilitating electrical energy load leveling.

E Energy: Efficient use of energy

- Thermal energy absorbed from the atmosphere heats the water that passes through the heat exchanger. The system produces approximately three to four times the amount of electrical energy used (high efficiency).

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- The natural refrigerant (CO₂) used by the QAHV-N560B has an ozone depletion potential of zero and a global warming potential of one. The volume of CO₂ emissions is 40% lower than that of a combustion-based boiler, and the generation of NO_x and other noxious substances is reduced.

Eco Cute for Commercial Applications

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Standard product	1997 product	1	1	1	1.73	1
	CAH-500AQ					
Evaluated product	2009 product	37% reduction in product weight	25% reduction in power consumption	99.96% reduction in greenhouse gases used (CO ₂ equivalent)	0.98	
	QAHV-N560B					
Details of improvement		Reduced size and weight through incorporating a compact, high-volume CO ₂ scroll compressor	Industry top-class energy savings	Switched from refrigerant with high global warming potential, to natural refrigerant		
Environmental impact factor		(1/Environmental impact of new product)/(1/Environmental impact of standard product)			1.77	
Performance factor		(Added value of new product)/(Added value of standard product)			1*	
Factor X: Environmental impact factor × Performance factor		(Added value of new product/Environmental impact of new product)/(Added value of standard product/Environmental impact of standard product)			1.77	

*No performance factor evaluation for this product.

Environmental Impact Factor

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	630.0	kg	445.0	kg
	Iron	368.0	kg	270.0	kg
	Copper	146.0	kg	141.0	kg
	Aluminum	47.0	kg	26.0	kg
	Resin (Recycled material)		kg		kg
	Resin (Non-recycled material)	25.0	kg	3.0	kg
	Others		kg		kg
	(2) Weight of recycled material		kg		kg
	(3) Weight of reused parts		kg		kg
	(4) Weight of 3R material [(2) + (3)]		kg		kg
	(5) Consumption of virgin resources [(1) – (4)]		kg		kg
	(6) Recyclable weight (3R possible)	561.0	kg	436.0	kg
	(7) Nonrecyclable weight [(1) – (6)]	69.0	kg	9.0	kg
E	Power consumption during annual operation (E1)	39,489	kWh	29,085	kWh
	Power consumption in annual standby state (E2)	1,004	kWh	259	kWh

	Total (Annual power consumption)	40,493	kWh	29,344	kWh
T	Lead usage in solder (T1)	6	g	0	g
	Cadmium usage (T2)	0.4	g	0	g
	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	4.4	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g
	HCFC refrigerant	12,000	g(R22)	0	g

Performance factor

Example of improvement of performance/life	Performance/life index
Expansion of the hot water output temperature range (from 60°C to 90°C)	-

Ventilator V-08PD7 / V-08PX7 (for Japanese market only)

Factor: 2.13; Performance Factor: 1.18;
Environmental Load Factor: 1.80

Compact ventilators equipped with the high-performance, compact motor ("MINIMO") and the newly developed "silent wavelet fan" blade for improved performance and energy efficiency.



Detailed environmental data

V-08PD7 / V-08PX7

M Materials: Effective use of resources

- Equipped with the "MINIMO" compact motor, which is 70% smaller and lighter than previous motors.

E Energy: Efficient use of energy

- Increased ventilation air volume by at least 25% by expanding air passageways.
- Up to 24% energy savings from high-density windings based on a structure of separate winding frameworks.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- No use of the six substances specified in the EU RoHS directive.

Ventilator V-08PD7 / V-08PX7

Summary data

		Environmental load				Value of product
		M: Effective utilization of resources	E: Effective utilization of energy	T: Avoidance of discharge of environmentally hazardous substances		
Baseline product	2005 product	1	1	1	1.73	1
	V-08PD5					
Evaluated product	2013 product	0.41	0.87	0	0.96	1.18
	V-08PD7					
Details of improvement		Reduction in weight by miniaturization of motor	Higher- density winding using block construction	Adoption of lead-free solder		Improvement of ventilation air volume; Reduction in power consumption
Environmental load factor: A		(1/Environmental load of new product)/(1/Environmental load of standard product)			1.80	
Performance factor: B		(Added value of new product)/(Added value of standard product)			1.18	
Factor X: AxB		(Added value of new product/Environmental load of new product)/(Added value of standard product/Environmental load of standard product)			2.13	

Environmental load factor

		Baseline product (2005 product equivalent)		Evaluated product	
M	(1) Weight of product	0.627	kg	0.466	kg
	Iron	0.238	kg	0.195	kg
	Copper	0.000	kg	0.027	kg
	Aluminum	0.037	kg	0.006	kg
	Resin (Recycled material)	0.000	kg	0.123	kg
	Resin (Non-recycled material)	0.190	kg	0.097	kg
	Others	0.162	kg	0.018	kg
	(2) Weight of recycled material	0.090	kg	0.196	kg
	(3) Weight of reused parts	0.000	kg	0.000	kg
	(4) Weight of 3R material [(2) + (3)]	0.090	kg	0.196	kg
	(5) Consumption of virgin resources [(1) – (4)]	0.537	kg	0.270	kg
	(6) Recyclable weight (3R possible)	0.465	kg	0.448	kg
	(7) Non-recyclable weight [(1) – (6)]	0.162	kg	0.018	kg
E	Power consumption during annual operation (E1)	4.200	kWh	3.650	kWh
	Power consumption in annual standby state (E2)	0.000	kWh	0.000	kWh
	Total (Annual power consumption)	4.200	kWh	3.650	kWh
	Lead usage in solder (T1)	0.500	g	0.000	g

Cadmium usage (T2)	0.000	g	0.000	g
Mercury usage (T3)	0.000	g	0.000	g
Hexavalent chromium usage (T4)	0.000	g	0.000	g
PBB usage (T5)	0.000	g	0.000	g
PBDE usage (T6)	0.000	g	0.000	g
HCFC refrigerant	0.000	g	0.000	g

Performance factor

Example of improvement of performance/life	Performance/life index
Increase in ventilation air volume	1.23
Improvement in power consumption	1.22
Reduction in noise	1.1
Performance factor	1.183

Environment – Energy Recovery Ventilator for Commercial Use

Energy Recovery Ventilator (LOSSNAY) LGH-50RX5-E for Commercial Use

Factor: 2.73

Performance Factor: 2.40

Environmental Impact Factor: 1.14

Equipped with the Hyper Eco Core, which delivers a total heat exchange efficiency of 66.5%, the LGH-50RX5-E is an Energy Recovery Ventilator that is both environmentally conscious and energy efficient. Thanks to the new ventilation pattern function, this product offers more precise control of ventilation to reduce the air conditioning/heating load caused by ventilation.



M Materials: Effective use of resources

- Fewer parts, fewer screws, thinner sheet metal.

E Energy: Efficient use of energy

- Total heat exchange efficiency of 66.5%.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminated the use of the six substances specified by the EU's RoHS directive.

Note

With the Hyper Eco Core, a new heat exchanger (Lossnay Core), this ventilator delivers total heat exchange efficiency of 66.5%, which is the leading position in the market. Keeping air conditioning/heating losses to a minimum, the 50RX5-E can save expenses in annual air conditioning/heating compared to a ventilator that simultaneously takes in and exhausts air. In addition, this product offers more flexible operation for individual days through its weekly timer function, while the Extra Low Mode makes it possible to implement 24-hour energy conservation ventilation. These functions provide more precise control of air volume, yielding much better energy-saving ventilation. Moreover, during the summer season, the Night Purge function draws cooler outside air into the room to reduce the load when the air conditioning is started the next morning, thereby boosting energy efficiency.

Lossnay Central Ventilator System VL-20ZMH3-L/-R

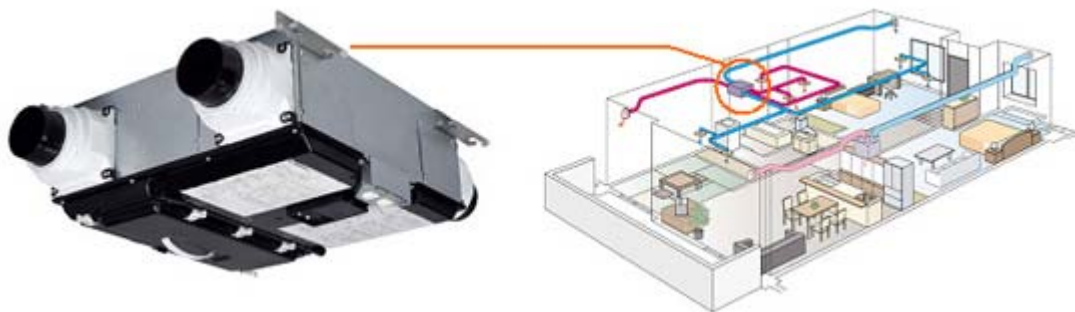
Factor: 2.73

Performance Factor: 2.40

Environmental Impact Factor: 1.14

A Ventilator System that Recovers Heat from Cooling and Heating Energy Using a Heat Exchanger

The Lossnay Central Ventilator System has air supply and air exhaust functions which can cover the entire household. The air flows exchange cooling or heating energy through a heat exchanger. This product incorporates DC brushless motors powered by a direct current power source on both the air supply and exhaust sides, significantly reducing power consumption compared with conventional models. In addition, the Hyper Eco Element heat exchanger greatly boosts heat exchange efficiency to realize even further energy savings.



Detailed environmental data

VL-20ZMH3-L/-R

E Energy: Efficient use of energy

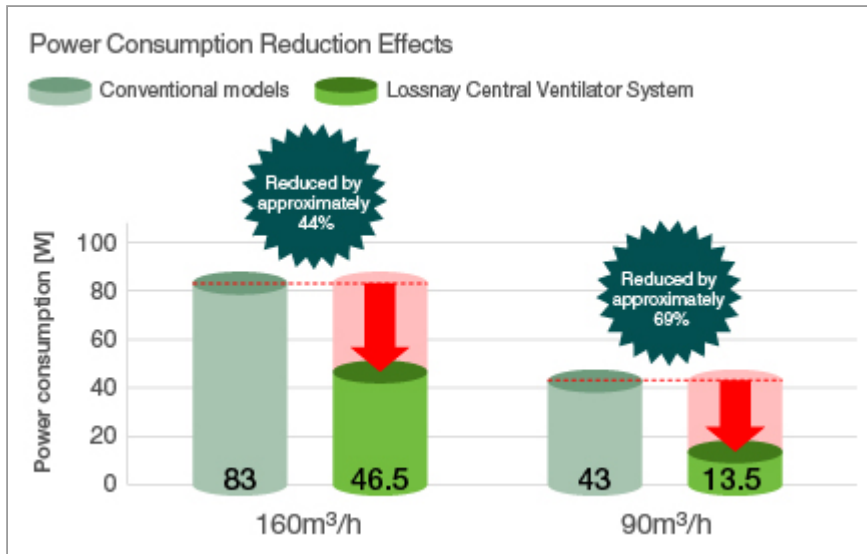
- Lossnay is an energy-saving ventilation system that recycles cooling and heating energy (heat recovery) by means of a heat exchanger. The Lossnay Central Ventilator System is a single unit that ventilates an entire household. The heat exchanger ensures ventilation without sacrificing the comforts of cooling and heating, and its high wind flow ensures that even in large housing complexes and cluster housing with numerous rooms, a single system suffices for one floor.

T Toxicity: Avoidance of substances that are potentially harmful to the environment

- Eliminated the use of the six substances specified by the EU's RoHS directive.

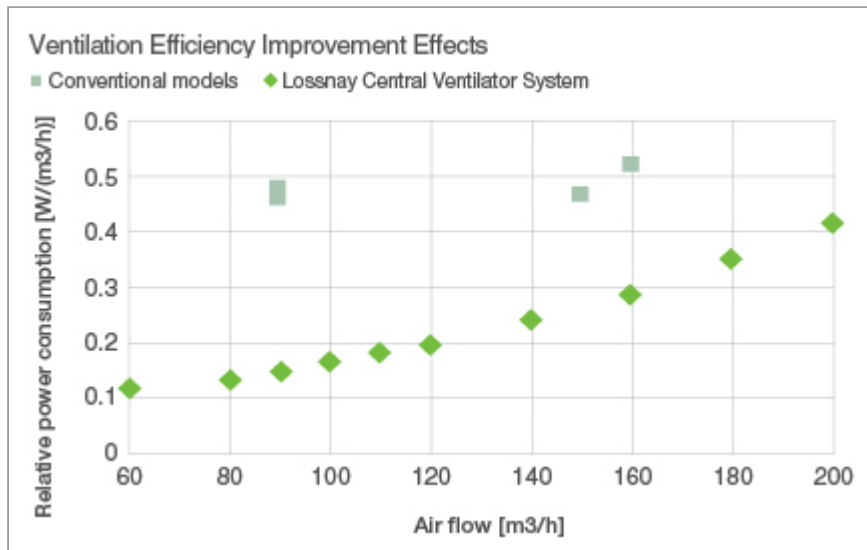
Note

Both the air supply and exhaust fans are controlled by DC brushless motors powered by a direct current power source, which significantly reduces power consumption compared to conventional Mitsubishi Electric models controlled by AC motors.



The Lossnay Central Ventilator System realizes a significantly higher relative power consumption* than existing Mitsubishi Electric models, even when driving the required 1 m³/h air feed.

* Relative power consumption [W/(m³/h)] = ventilator power consumption [W]/ventilator air flow [m³/h]



Lossnay Central Ventilator System

Summary data

		Environmental load				Value of product
		M: Effective use of resources	E: Efficient use of energy	T: Avoidance of substances that are potentially harmful to the environment		
Standard product	1997 product	1	1	1	1.732	1
	VL-200ZM					
Evaluated product	2009 product	0.90	0.28	0	0.946	1.206
	VL-20ZMH3-L					
Details of improvement		Switched from steel plate to plastic	Air flow performance improvements	Use of lead-free solder		Items for consideration: <ul style="list-style-type: none"> Improved temperature exchange efficiency Improved enthalpy exchange efficiency
Environmental impact factor		(1/Environmental impact of new product)/(1/Environmental impact of standard product)			1.83	
Performance factor		(Added value of new product)/(Added value of standard product)			1.206	
Factor X: Environmental impact factor × Performance factor		(Added value of new product/Environmental impact of new product)/(Added value of standard product/Environmental impact of standard product)			2.207	

Environmental Impact Factor

		Standard product (1990 product equivalent)		Evaluated product	
M	(1) Weight of product	17	kg	14.8	kg
	Iron	12	kg	7.7	kg
	Copper	0	kg	0	kg
	Aluminum	0	kg	0	kg
	Resin (Recycled material)	0	kg	0	kg
	Resin (Non-recycled material)	4	kg	4.5	kg
	Others	1	kg	2.6	kg
	(2) Weight of recycled material	4.2	kg	2.7	kg
	(3) Weight of reused parts	0	kg	0	kg
	(4) Weight of 3R material [(2) + (3)]	4.2	kg	2.7	kg
	(5) Consumption of virgin resources [(1) – (4)]	12.8	kg	12.1	kg
	(6) Recyclable weight (3R possible)	0	kg	0	kg
	(7) Nonrecyclable weight [(1) – (6)]	17	kg	14.8	kg
E	Power consumption during annual operation (E1)	734	kWh	208	kWh
	Power consumption in annual standby state (E2)	0	kWh	13	kWh
	Total (Annual power consumption)	734	kWh	221	kWh
	Lead usage in solder (T1)	2	g	0	g
	Cadmium usage (T2)	0	g	0	g

T	Mercury usage (T3)	0	g	0	g
	Hexavalent chromium usage (T4)	0	g	0	g
	PBB usage (T5)	0	g	0	g
	PBDE usage (T6)	0	g	0	g

Performance factor

Example of improvement of performance/life	Performance/life index
Ventilation air flow: 120m ³ /h → 120m ³ /h	1
Temperature exchange efficiency: 64% → 71%	1.109
Enthalpy exchange efficiency (heating): 51% → 66.5%	1.304
Enthalpy exchange efficiency (cooling): 45% → 63.5%	1.411
Performance factor (Average)	1.206

Environment – The Environment and Business

Through its products and services, the Mitsubishi Electric Group is engaged in environmental-based social contributions and corporate enhancements to strengthen its constitution designed to minimize its impact on the environment, aiming to consolidate our position as a global leading green company. Here, leaders from each of our business groups talk about changes taking place in their operating environments and discuss what they are focusing on in their initiatives and measures.

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



Overview

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 electrical equipment for rolling stock. To reduce the environmental impact associated with these products and services, we have aimed for more compact, lighter weight, higher performance and higher efficiency designs to achieve greater material and electricity savings. Our focus in recent years has also been on next-generation infrastructure, including solutions for total optimization of energy use of rolling stock and for so-called smart communities. The Public Utility Systems Group's primary sites—Kobe Works, Itami Works and Nagasaki Works—are each in charge of design and manufacturing with a focus on the assembly of built-to-order products. As a result, these sites are taking steps to realize energy-savings and more effective use of resources by making improvements to equipment, operations and processes.

Message from Senior Management

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, in design/manufacturing, while ensuring high quality/functionality, we are continuing to promote less use of resources/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 technology (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 total optimization of energy used by railways through ICT, we have developed new energy technologies and create 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 recently developed a SiC-based main circuit system and auxiliary power unit for station buildings, both of which successfully increase energy savings. 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 as well as R&D efforts.



Takahiro Kikuchi
Executive Officer
In Charge of Public Utility
Systems

We will also make changes in-house to improve our manufacturing equipment, operations and processes, including the use of LED lighting and higher efficiency air conditioners, with the ultimate goal of reducing the environmental impact of our production activities.

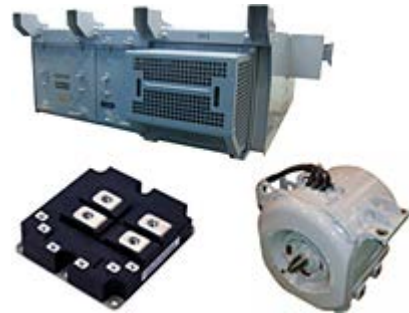
Products and Services Making a Difference

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.

- **Main Circuit System using SiC Power Modules**

Our rolling stock inverters and induction motors now feature SiC power modules, which help increase efficiency, reduce weight and mitigate noise. This new design reduces main circuit system power consumption by approximately 30% compared to conventional products.



SiC power module and applicable products

- **Station Energy-Saving Inverter**

We performed a validation test on a station energy-saving inverter (S-EIV) that directly supplies electricity generated by railcar regenerative braking to power station lighting, air conditioning and elevators, and successfully achieved a 600kWh reduction in the station's daily power consumption. We will begin providing these inverters in fiscal 2014 to help ensure that electricity from regenerative braking is fully utilized.

- **Power-Supply System that Helps Reduce Station Emissions to Zero**

We created a power-supply system that stores surplus electricity generated in the daytime by a PV system in a lithium-ion battery and then supplies this power when needed, with the ultimate goal of a zero-emissions station that does not use commercial power.

- **Traction Energy Control System**

We are developing the Traction Energy Control System, which uses ICT to control overhead voltage based on the railcar's operating status. Set to be launched sometime in 2014, this solution streams railcar information in real-time via a wireless network to a terrestrial management system that controls output at substations and electricity storage systems. The ultimate goal of the solution is to minimize energy consumption across an entire railway system.

More Compact and Lighter Weight Railcar Air Conditioners

We developed a more compact and lightweight air conditioning system for railcars with reduced power consumption. This was achieved by controlling compressor capacity and with the use of a higher efficiency thin-tube heat exchanger and ventilator fan.

Lighter Weight Automatic Platform Gates

We reduced the size and thickness of steel plating used for automatic platform gates and modified the structure, without sacrificing passenger safety, achieving a lighter weight design. We also made improvements in the control method to cut the current of electricity when the doors are closed (not in operation), reducing standby power in the process.

Higher Efficiency and More Compact Air Source Ozone Emitter

Our ozone emitter is being used in advanced water treatment processes and paper pulp bleaching because of its 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 emitter

Corporate Enhancements to Strengthen Our Constitution

Continuous Improvement Activities

The Public Utility Systems Group's primary sites—Kobe Works, Itami Works, and Nagasaki Works—are taking steps every day to reduce their energy usage by streamlining equipment, operations and processes.

- **Equipment Improvements**

New lines built at the Kobe Works and Itami Works employ LED lighting, higher efficiency air conditioners and PV systems to achieve greater energy savings. We are also encouraging other factories and offices to switch to LED lighting, higher efficiency transformers and higher efficiency air conditioners.

- **Operations and Process Improvements**

We are working to more efficiently utilize energy by reducing the use of electricity during testing on large equipment, such as VVVF* devices for railcars, and using exhaust heat from boilers for prewarming hot-water tanks. In addition, we are reducing CO₂ emissions during distribution by improving load ratios achieved by shipping products in bulk and by shifting certain shipments to railway or marine freight from trucks.

* VVVF: Variable Voltage Variable Frequency. A control method used for AC electric motors.

Overseas Production and Maintenance Sites

To respond to today's heightened demand for railway transportation overseas to prevent future global warming, we have launched production activities at overseas sites in North America and Mexico. To prepare for greater demand in Europe and Asia, we will reinforce and expand our overseas production sites and promote local production for local consumption, in order to reduce CO₂ from transportation.

Overview

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 international overseas.

Message from Senior Management

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 the development of high-efficiency 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. We have installed testing facilities to examine the transmission and distribution networks of 2020 to build-up technologies and expertise in highly reliable and economical electricity systems that are low-carbon, in using energy more rationally by helping users to visualize and control their consumption, and in robust energy infrastructure that can operate seamlessly even in emergency situations. Moreover, our future business strategy calls for a further increase in the efficiency of thermal power generation, promoting the nuclear power business based on the energy policies of each country, and developing equipment and devices that can stabilize electricity systems to accommodate new demand (new electricity systems that use clean sources of energy, such as offshore wind farms, and accommodating Japan-wide electricity supply and demand by connecting power companies).



Yoshiaki Nakatani

Executive Officer
In Charge of Energy &
Industrial Systems

Our own corporate enhancements to strengthen our constitution focus on important aspects of our core business, including continually reducing the use of energy on a comparatively greater scale through manufacturing and testing, and initiating more in-depth management of chemical substances.

Products and Services Making a Difference

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-loss turbine generator

Switches that Reduce Environmental Impact

In fiscal 2013 (ending on 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 transmission and conversion that occurs between power plant and user and that can reduce heat generation, which helps curb CO2 emissions. We are also developing compact transformers that help reduce materials usage.

Smart Grid and Smart Community Verification Testing

We have set up a large in-house verification testing facility that is being used together with power companies to research and develop smart grids and smart communities.



Verification testing facility

Corporate Enhancements to Strengthen Our Constitution

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 as well as 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 2013 Implementation Status

- **Environmental Promotion Conferences**

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

Theme: Reduce CO₂ from production and promote zero emissions

Main results: Reduced summertime peak electricity usage by 13% compared to fiscal 2011 (Power Distribution Systems Center), electrified steam-based equipment for plating (Transmission & Distribution Systems Center), changed factory lighting from mercury bulbs to LED (Energy Systems Center)

- **Environmental Audit**

Performed audits on SGC Co., Ltd., Ryousai Technica Corporation, Melco Control Products Corporation (Hyogo Prefecture), Ryosan Industry Corporation's Asahi Factory (Aichi Prefecture) and Tada Electric Co., Ltd. (Okayama Prefecture)

- **Environmental Survey**

Surveyed Mitsubishi Electric Power Products Inc. (USA)

Overview

Delivering Safe, Secure and Convenient Products and Solutions that Enhance the Overall Value and Functions of 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. We recognize the importance of delivering and maintaining safe, secure and convenient products, precisely because they are key components of social infrastructure. To this end, we provide a full range of support that spans from initial sale to maintenance services and upgrades. Additionally, with the Facima¹ & DIGUARD² systems, we also deliver new solutions that enhance the overall value and functions of buildings. Inazawa Works, which serves as a mother factory to nine production sites around the world, including in Thailand and China, manufactures elevators for markets in Japan and overseas as well as fabricates, paints and assembles control devices, such as hoisting devices, interior pieces and circuit boards. Inazawa Works has also rolled out initiatives to reduce environmental impacts during manufacturing at each of its sites around the world.

1 Facima: Open integrated management system for building facilities.

2 DIGUARD: Mitsubishi Electric's total security solution.

Message from Senior Management

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

In recent years, there has been a sharp increase in demand for elevators, driven by economic growth and urbanization in China, India and other emerging nations. With society also demanding greater energy-saving performance, the Building Systems Group recognizes that it has a mission to provide safe, energy-efficient, compact and lightweight elevators to customers everywhere. We are rolling out new and more energy-efficient and eco-friendly models as part of our efforts to encourage the shift to our high-speed elevator control devices with full silicon carbide (SiC) semiconductor power modules. In Japan alone there are some 40,000 Mitsubishi Electric elevators that have reached the end of their 25-year service life, meaning demand for renewal will steadily increase both domestically and internationally. For example, an up-to-date renewal of a conventional roped elevator can cut power usage by up to 60%³. As a result, these new cutting-edge models can play an important role in reducing society's carbon footprint. In order to proactively respond to the needs of making entire buildings more energy-efficient and use less electricity, we have developed new solutions through our Facima & DIGUARD systems for optimizing entire buildings. These systems enable us to reduce power usage without sacrificing user convenience or comfort.



Mitsuo Muneyuki

Representative Executive Officer and Executive Vice President In Charge of Export Control and Building Systems

In terms of production, our mother factory, Inazawa Works, has rolled out initiatives aimed at reducing CO₂ emissions from production, curbing the use of chemical substances and promoting greater recycling at each of its sites in Japan and overseas. These initiatives form our commitment to environmentally friendly manufacturing.

3 Up to 60%: Compared to conventional Mitsubishi Electric control systems. This amount may vary depending on the elevator control system.

Products and Services Making a Difference

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 with a gear-less hoist that uses our permanent magnet motor, the use of LED ceiling lighting inside the car, reduced standby power usage when the elevator is not in use, and optimized balance between the car and weight. AXIEZ Series elevators can also reduce power consumption even further with its converter system that stores and uses electricity generated during braking.



AXIEZ car interior

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 employs a gear-less hoist that uses our permanent magnet motor. This results in a more compact and lightweight design that can cut power consumption by 20% compared to conventional models. NEXIEZ Series elevators can also reduce power consumption even further because they use LED interior lighting and a converter system that stores and uses electricity generated during braking.

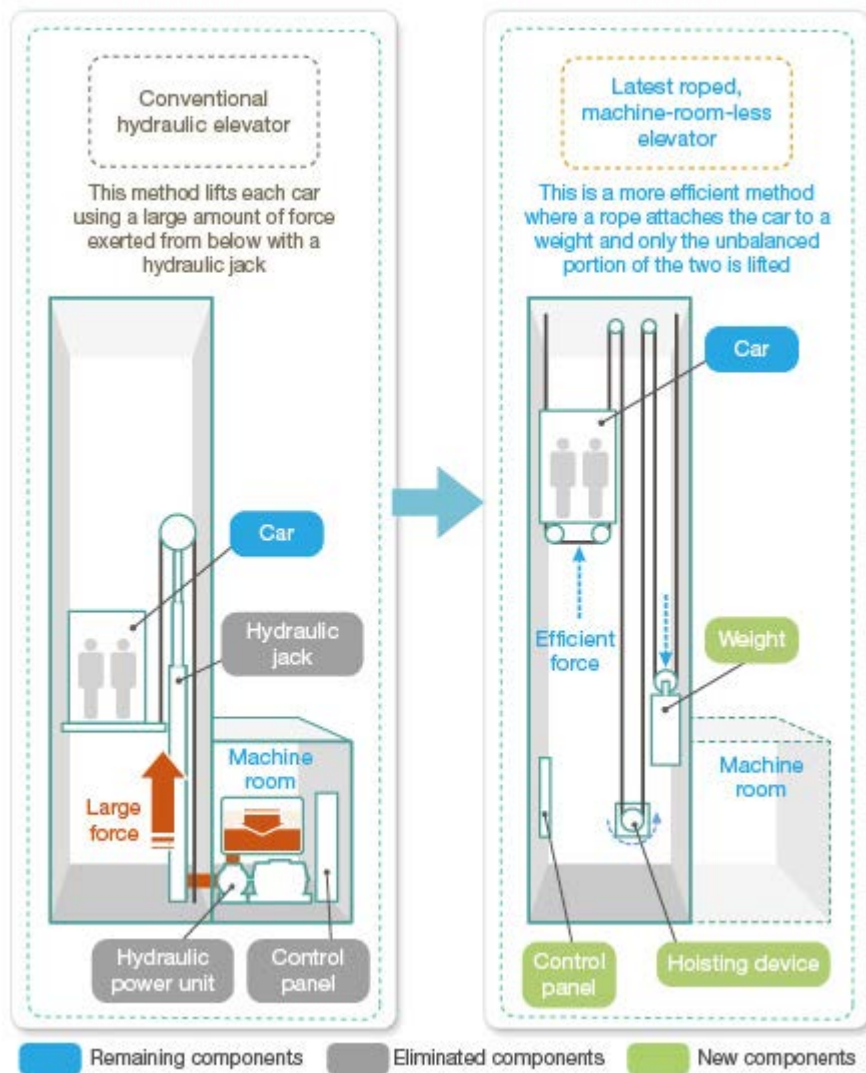


NEXIEZ car interior

EleFine Service – Offering a Full Line-up of Solutions for Renewal of Hydraulic Elevators

The EleFine service upgrades hydraulic elevators to state-of-the-art roped, machine-room-less elevators through refinements made to controls and the drive. Through renewal to the latest roped, machine-room-less elevator with VVVF* inverter, an elevator can cut its power consumption by as much as 65%, while also providing a smoother, more comfortable ride. We can also reduce the amount of waste resulting from complete replacements by up to 60% because this service simply reuses the existing platform and car and upgrades the controls and drive.

* VVVF: Variable Voltage Variable Frequency. A control method used for AC electric motors.



Renewal from Hydraulic Elevator to Roped, Machine-Room-Less Elevator
<Elevator Renewal Diagram>

Facima BA-system touch, an Open Integrated Management System for Building Facilities

We launched Facima BA-system touch in February 2013 as a building facilities management system for small- and medium-sized buildings. This system monitors peak electricity usage and offers a demand control feature that suspends air conditioning and lighting equipment, when needed, in order of priority determined in advance by the building manager. This enables automated control of various building facilities customized to tenant business hours and holidays. The system's LCD touch panel wall-mount control saves space and makes for easy operations.



Facima BA-system touch control panel

Corporate Enhancements to Strengthen Our Constitution

Rolling out Initiatives of Mother Factory, Inazawa Works at Overseas Sites

The Building Systems Group manufactures building system products in Japan, Thailand, China and six other countries around the world. Moving forward, our focus will be on local production for local consumption, as we take steps to increase the amount of production at overseas sites. The following measures implemented at the mother factory, Inazawa Works will also be proactively rolled out at overseas sites to enable us to reduce our environmental impacts globally. Machinery used during the fabrication process such as cutting tools and the paint process use the most amount of energy. As a result, we are currently taking steps to reduce energy consumption in each of these processes and also make realistic improvements to our painting process.

- **Low-Temperature Treatment Prior to Painting**

Building system products are painted to prevent rust and to provide unique design flair. The cleaning process used to treat parts prior to painting and the drying process after painting use a large amount of heat energy. We re-examined the necessary temperature for hot water used during the cleaning process and looked once again at the treatment liquid used during the chemical treatment process prior to painting. As a result, we decided to lower the temperature to achieve greater electricity savings.

- **Use of Renewable Energy**

A total of 896 photovoltaic module panels (total output of 201.6kW) were installed on the roof of Inazawa Works, with the electricity generated used to power facilities and air conditioning equipment inside the factory.

- **Upgrading Aging Facilities to LED Lighting**

We updated aging boilers and compressors to more efficient equipment and also began using LED lighting when replacing lighting equipment, in order to achieve greater energy savings.

- **Materials Recycling and Reduction of Wooden Packaging Materials and Trucks**

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's worth of materials every month. In addition, we are also working to reduce the amount of wooden packaging materials and the number of trucks.

-

Overview

Safeguarding Peoples' Lives and Contributing to Space Research and Cutting-Edge Technologies

Mitsubishi Electric's Electronic Systems Group is safeguarding peoples' lives and contributing to space research and cutting-edge technologies through its manufacturing of large terrestrial telescopes, like the Subaru Telescope, terrestrial space systems required for satellite operations, as well as communications, broadcast and weather satellites. We also supply electronic equipment to communications companies and automotive manufacturers, such as contact image sensors used in copiers and millimeter-wave radar used in vehicle safety systems. Production takes place primarily at the Kamakura Works and Communication System Center located in Amagasaki, Hyogo Prefecture.

Message from Senior Management

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, the Ibuki satellite (GOSAT) launched in 2009 that we manufactured is being used to observe the concentration distribution of greenhouse gases and to monitor emissions and absorption of these gases, which is helping to prevent global warming. In addition, Himawari 8 and Himawari 9, which are stationary environmental observation satellites planned for launch in 2014 and 2016, respectively, will provide even greater capabilities in monitoring global warming and weather phenomena. As for ground-based solutions, our Doppler Lidar, which can accurately measure winds through our proprietary technology, is contributing to the optimized operations of wind farms, which are important forms of clean energy. Furthermore, as a future initiative, the Electronic Systems Group is conducting research into the commercialization of a space-based photovoltaic array that can deliver stable supplies of electricity 24 hours a day by sending electricity generated in space back to earth using radio waves. We are also working to reduce CO₂ emissions from the production of these products.



Takashi Sasakawa
Senior Vice President
In Charge of Electronic
Systems

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 method of air conditioning and testing equipment in order to use energy more efficiently. The satellite production building at Kamakura Works completed in March 2013 has implemented many of these measures, enabling it to reduce CO₂ emissions by approximately 23% compared to our conventional production methods. Going forward, the Electronic Systems Group will continue to contribute to the realization of a sustainable society through the development of cutting-edge technologies and products as well as the optimization of production equipment.

Products and Services Making a Difference

Involved in the Development of Ibuki (GOSAT) Helping to Solve Environmental Problems

Mitsubishi Electric was the primary manufacturer of the Greenhouse Gases Observing Satellite (GOSAT) Ibuki, which was launched in 2009 by the Japan Aerospace Exploration Agency (JAXA). Ibuki is being used to observe the planet-wide concentration distribution of CO₂, methane and other greenhouse gases that cause global warming from space. This satellite will be able to observe some 56,000 locations, which is 150 times more than conventional satellites. In December 2012, planet-wide monthly and regional CO₂ absorption and emission amount (net figure) estimates calculated based on data from Ibuki were released by the Ministry of the Environment, the National Institute of Environmental Studies (NIES) and JAXA, quantitatively validating the use of observation data from the satellite.



GOSAT Ibuki

Doppler Lidar Systems that Raise Wind Farm Efficiency

Doppler Lidar systems detect aerosols in the atmosphere, such as dust and particulate matter invisible to the naked eye, and measures their speed and direction in order to measure wind speed and wind direction. This enables real-time measurement of winds that could not be measured with ordinary wind gauges. This data is in turn utilized for remote wind studies and to raise the efficiency of the increasingly larger wind turbines and wind farms of today and the future.



Doppler Lidar

Corporate Enhancements to Strengthen Our Constitution

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.

- Making adjustments to air conditioning used for cleanrooms and testing equipment
- Using heat analysis to eliminate hot spots in computer server rooms. Separating cold and hot ductwork for air conditioning units and servers. Optimizing air conditioning unit controls.

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 heater), and used a central heat source system¹ to control electricity usage of air conditioning systems.

- **Building Design**

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.²

- **Power Generation and Monitoring**

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.

- 1 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.
- 2 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.

Overview

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 its 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 (ICT) as well as surveillance cameras utilizing the latest in video surveillance technologies. ICT 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 as well as cutting-edge development facilities at the Koriyama Factory in Fukushima Prefecture and the Communication Network Center in Amagasaki, Hyogo Prefecture.

Message from Senior Management

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

ICT networks that incorporate optical and wireless communications technologies are key elements of social infrastructure that make advancements 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 impacts 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 are 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
Executive Officer
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 impacts.

Products and Services Making a Difference

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.

Environmental Assessments

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 Factory – Reduced CO₂ emissions from Production by 25%

At our Koriyama Factory, 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, by improving productivity and installing the following energy-saving utilities.

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

1. Photovoltaic system: 1800 PV panels with a total output of 403.2kW 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 Factory – Reduced Use of Organic Solvents

Koriyama Factory, 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, which also reduced space 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 its 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

Overview

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. In fiscal 2013, we launched an all-new concept called "Smart Quality," under which we are providing a broad range of eco-friendly products and services for the home, office and industry. Each of our production sites assembles products on mass production lines. In Japan, these production sites include Nakatsugawa Works, Air Conditioning & Refrigeration System Works, Shizuoka Works, Kyoto Works and Gunma Works, as well as affiliates Mitsubishi Electric Lighting Co., Ltd. and Mitsubishi Electric Home Appliance Co., Ltd. We are also improving productivity to reduce energy consumption through just-in-time activities aligned with our activities in China, Southeast Asia and Europe.

Message from Senior Management

Developing Eco-Friendly Products and Reducing Our Own Environmental Impacts

The Living Environment & Digital Media Equipment Group recognizes that reducing the environmental impacts of its customers through recycling and energy efficiency will help to enhance the competitiveness of their business activities as well. As a result, we are supplying a broad range of eco-friendly products and services for the home, office and industry, based on our newly launched concept "Smart Quality," announced in fiscal 2013. These include energy-saving products that reduce CO₂ from usage as well as PV systems that generate renewable energy and do not produce CO₂ during power generation.



Hiroyuki Umemura
Executive Officer
In Charge of Living
Environment & Digital Media
Equipment

In addition, we are moving forward with corporate enhancements to strengthen our constitution with a focus on reducing CO₂ emissions from production and more effectively utilizing resources, which are both key themes under Mitsubishi Electric's Environmental Vision 2021. We promote energy conservation activities through productivity improvements made with just-in-time activities, and Gunma Works received the Director General's Prize, the Agency for Natural Resources and Energy, in the Successful Case of Energy Conservation Category of the Energy Conservation Awards in fiscal 2013 for its factory-wide energy-saving activities that helped it achieve a 30% reduction in peak electricity usage. Meanwhile, Mitsubishi Electric Consumer Products (MCP) in Thailand, one of our overseas production sites, received a 2012 ASEAN Energy Award from the ASEAN Centre for Energy for its energy conservation 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.

Products and Services Making a Difference

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

We developed the Slim ZR Series of package air conditioners, released in May 2013, for retail stores and office spaces. These air conditioners feature the Move-Eye 360 sensor for monitoring people and floor temperature, as well as the industry's first power sharing operation function that can control multiple outdoor units as a combined system to achieve further electricity savings.



Package air conditioners for retail stores and office spaces

Hybrid Kirigamine Room Air Conditioner that Eliminates Electricity Waste

We released the Hybrid Kirigamine room air conditioner in November 2012. This unit features the smart stop function, which eliminates electricity waste by shutting itself off after it detects no-one is in the room, and the smart hybrid system, which reduces operating time of cooling using cold blasts of air.



Hybrid Kirigamine

Achieved Industry-Leading Annual Performance Factor (APF)

Past energy conservation indicators for air conditioners showed the average energy efficiency at the rated capacity for both cooling and heating. However, since the power consumption and necessary capacity of an air conditioner varies with changes in outside air temperature, the actual situation of air conditioners in each season was not reflected. As a result, the annual performance factor (APF) was rolled out in 2007 as a new energy efficiency indicator. Mitsubishi Electric air conditioners have achieved industry-leading APF, which can more accurately assess energy efficiency in actual situations.

Heyaboshi 3D Move-Eye Dehumidifier Receives 2012 Energy Conservation Award

In 2010, the Heyaboshi 3D Move-Eye infrared mobile sensor that can detect damp laundry articles was installed in our conventional dehumidifier, while in 2011 the Ecoboshi Mode with hybrid airflow function was added. In 2012, the Area Cut Control feature, which directs the airflow directly at damp laundry articles, and an electricity saving mode, which determines the amount of laundry and adjusts airflow automatically, was also added. These improvements helped to achieve energy savings of up to a 40% compared to use in standard mode when the Move-Eye sensor is off. This achievement was recognized by the Energy Conservation Center, Japan (ECCJ), and awarded the Chairman's Prize at the 2012 Energy Conservation Awards.

MILIE – Low Power Consumption LED Lighting

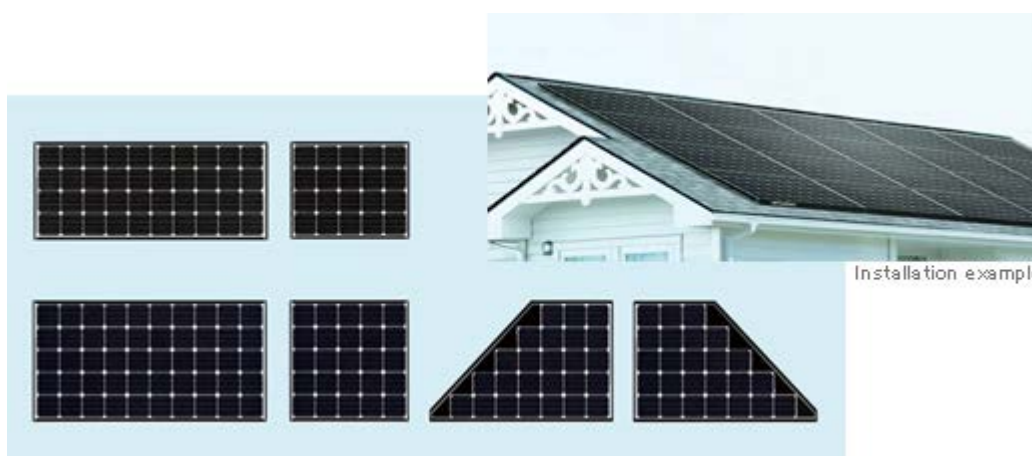
In October 2012, we launched a new LED lighting brand called MILIE, which was coined from the words Mitsubishi, Lighting and Ecology, expressing our desire to make positive contributions to the Earth and its people through LED lighting. MILIE has been supplied to a variety of businesses, factories, retail 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 line-up of slim PV cell modules that are available in various shapes and that leverage durability and performance to offer 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 line-up.



Multi Roof 220W Series PV module

Corporate Enhancements to Strengthen Our Constitution

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

Each of our works and affiliates uses Mitsubishi Electric high-efficiency air conditioners, LED lighting and photovoltaic systems to reduce CO₂ emissions from production.

Reusing Large, High-Purity Recycled Plastics in 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. As a technology for achieving even greater efficiency, together with Shimadzu Corporation, 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. This technology is being used to make advancements in our recycling business, including the automation of purity screening and sorting processes.

Launched Rare Earth Magnet Recovery Business

In April 2012, affiliate Green Cycle Systems Corporation began recovering rare earth magnets from used air conditioner compressors.

Overview

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, power distribution and control products to automotive manufacturers, equipment manufacturers and other customers in the manufacturing industry. Each of our production sites is a mass production facility with automated lines powered by industrial robots, and strives to incorporate proprietary energy-saving equipment, systems and solutions as well as accumulate expertise and experience in technological development. In Japan, the Nagoya Works and Fukuyama Works house manufacturing and design sites. Overseas, we have manufacturing, sales and service sites in China, Southeast Asia, India and the United States. 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.

Message from Senior Management

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 impacts 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 the productivity and reduces energy costs associated with factory production equipment, which consume large amounts of energy. We also utilize this solution in-house as part of our efforts to reduce CO₂ emissions from production.



Hideyuki Okubo
Executive Officer
In Charge of Factory
Automation Systems

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 compliant with the IE3 efficiency rating under the U.S. Energy Independence and Security Act (EISA). 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 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.

Products and Services Making a Difference

Energy Solution "e&eco-F@ctory®"

Energy solution "e&eco-F@ctory®" combines our control and network technologies from factory automation equipment and measurement technologies from our energy-saving activities in the field of power distribution to improve the productivity and reduce the energy costs associated with factory production equipment, which consume large amounts of energy. This solution helps visualize the energy usage per unit of production; i.e., the specific energy consumption.



MELSEC-Q Series
energy measuring unit

Development of Products Compliant with "Top Runner" Standards

We launched a transformer compliant with "top runner" standards (2nd version) set for fiscal 2015 (ending on Mar. 2015) and a high-performance energy-saving motor that is compliant with the IE3* efficiency rating under the U.S. Energy Independence and Security Act (EISA). If all of the approximately 100 million standard motors in Japan were replaced with IE3-compliant motors, statistics 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.



Energy-efficient motor
"Superline Premium Series
SF-PR"

* IE3: U.S. energy efficiency regulation NEMA MG1-12-12.

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 reduce environmental impacts from the sheet metal processing used for vehicles, construction equipment, farm equipment, railcars and home appliances.



Laser processing machine

- **Recipient of the Agency of Natural Resources and Energy Director's Award at the 2012 (32nd) Energy Conserving Machinery Awards Ceremony**

The highly productive 2D laser processing machine in the eX Series received the Agency of Natural Resources and Energy Director's Award at the 32nd Awards Ceremony held by the Japan Machinery Federation.

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, while the higher reliability means that we no longer need to use surplus electricity from controlling the start and stop of the factory line. 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.



C language controller

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

- **Recipient of 2012 (55th) Best 10 New Products Awards "Monozukuri Award"**

Our iQ Platform compliant C language controller "Q24DHCCPU-V" received the Monozukuri Award, given to excellent manufacturing technologies or new market development, at the 2012 (55th) Best 10 New Products Awards organized by the Nikkan Kogyo Shimibun.

Corporate Enhancements to Strengthen Our Constitution

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

We are reducing 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 higher efficiency 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 24,800kWh/year and reduced replacement costs by 370,000 yen/year).

Promoting Activities Customized for Each Production Line

In addition to the previous measures, 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**
Fukuyama Works has an integrated production system that spans from parts processing to sub-assembly and final assembly. The sub-assembly line is completely automated, using 85 multiple 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**
Nagoya Works' mass production line is achieving greater energy efficiency by improving its takt 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.

Using Insulation and Waste Heat - Affiliates in Japan

Affiliates in Japan that form part of the Factory Automation Systems Group mainly fabricate parts and assemble products, which includes materials processing and surface treatments (plating and painting). Affiliates also use equipment that has a relatively larger environmental footprint than that of the Nagoya or Fukuyama Works. These facilities, which account for large environmental impacts, are conducting improvement activities that include the use of insulation and waste heat as well as changes to operations.

Plans for Local Production for Local Consumption - Overseas Factories

Our manufacturing sites in China, Southeast Asia, India and the United States perform knock-down production where major components made in Japan are assembled locally. Going forward, we plan on increasing the amount of design and materials procurement work at these overseas sites in order to reduce CO2 emissions during transport, by pursuing local production for local consumption.

Conserving Electricity with a Demand Monitoring System

In July 2011, in the wake of serious electricity shortages following the Great East Japan Earthquake and Fukushima Daiichi Nuclear Power Plant accident, the Government of Japan required large utility users consuming more than 500kW from areas served by Tokyo Electric Power and Tohoku Electric Power to reduce their peak energy consumption by 15% compared to the previous year. In response, the Mitsubishi Electric Group set a target to reduce its total peak energy consumption by 25% year-on-year, more than the government mandated amount, and took measures toward achieving this ambitious target. The Fukuyama Works developed a demand monitoring system at the Mitsubishi Electric head office to monitor energy usage at all 18 of its sites located within areas served by Tokyo Electric Power and Tohoku Electric Power in order to achieve this target. This system automatically issues a warning email when energy consumption is likely to exceed the target. Each site implemented electricity conservation measures prepared in advance based on changes in demand, such as sharing energy usage data between sites, based on the instructions of the Mitsubishi Electric head office. Thanks to these efforts, Mitsubishi Electric was able to reduce its peak energy usage by 25% in both areas served by Tokyo Electric Power and Tohoku Electric Power. At the same time, it was also able to make contributions to the overall energy efficiency of the company. Since 2012, the coverage of the demand monitoring system has been expanded to all 68 of the Group's sites in Japan, enabling Mitsubishi Electric to pursue even more effective energy conservation activities.

Overview

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 in the development process and provide a wide range of services, spanning from production and supply to spare parts and rebuilds. Each of our production sites mass produce parts, while our three development sites (Himeji Works, Sanda Works, Fukuyama Works) function as a mother factory that also manages our other production sites in the Americas, Europe, Asia and China. In recent years, we have been promoting greater local procurement and local production in order to build an optimal global production system.

Message from Senior Management

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 idle stop and start systems are essential for greater vehicle fuel efficiency. Consequently, we are focusing great efforts on the development of value-added versions of these products that are more efficient, have a higher output, and that are 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. Going forward, we believe our next social mission will be to widely popularize electronic components used in EVs and HEVs.

With local procurement and local production growing globally, we are taking measures to reduce environmental impacts from our production activities and enhance our environmental controls. To that end, we believe it is vital to steadily promote these measures through close collaboration with our mother factory in Japan, including monitoring compliance with environmental laws and regulations covering our activities and products around the world.



Yutaka Ohashi
Executive Officer
In Charge of Automotive
Equipment

Products and Services Making a Difference

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 idle start and stop 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

Development Related to EVs and 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 fuel-efficient products.

* EVs: Electric vehicles; HEVs: Hybrid electric vehicles



Audio navigation system "DIATONE SOUND.NAVI"

Corporate Enhancements to Strengthen Our Constitution

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 rolling out these same measures at sites in the Americas, Europe, Asia and China.

- Lean manufacturing using the 3Ms (muda, mura, muri) (waste, variation, overburden)
- Upgrading to higher efficiency equipment
- Operational improvements using just-in-time activities
- Sharing of best practices

Overview

Delivering Key Devices Supporting the Information Society to Customers Around the World

Mitsubishi Electric's Semiconductor & Device Group delivers key devices supporting the information society. Our extensive line-up includes motor controls for 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 takes place at the Power Device Works, High Frequency & Optical Device Works and the sites of affiliates in Japan and overseas that belong to the LCD Division. 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.

Message from Senior Management

Helping Society Reduce its Carbon Footprint by Providing Low Power Consumption Products

Motors used in home appliances, electric railways and industrial equipment are said to consume approximately 50% of the power used in all of Japan. Inverters represent the key component for minimizing wasted power consumption because they carefully control motor revolutions. The Semiconductor & Device Group provides these inverters along with power conditioners that convert direct-current electricity from photovoltaic systems to alternating-current and power devices (semiconductor devices that control and convert electricity) mounted in power converters used in various power source devices. The latest sixth-generation power devices are able to reduce power loss by 75% compared to first-generation models. We are currently working actively on the use and commercialization of next-generation silicon carbide (SiC) power devices because of the drastic reductions in energy usage this material is expected to achieve over conventional silicon. As IT penetrates every facet of our lives and the amount of information communications increases unimpeded, the global challenge facing society will be how to make IT more energy-efficient. To solve this challenge and ensure the availability of IT equipment with ultra-low power consumption, 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. In the field of TFT LCD modules, we were among the first to focus on mercury-free white-light LEDs that offer lower power consumption than conventional cold cathode fluorescent lamps (CCFL), having developed an extensive line-up that spans from standard products to outdoor products with ultra-high 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.



Masaki Sukuyama
Representative Executive
Officer and Executive Vice
President
In Charge of Semiconductor &
Device

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

quantities of energy.

Products and Services Making a Difference

Low Power Consumption Power Devices

Power devices have been developed and produced using silicon semiconductors, but are fast 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 designated company of the Green Asia International Strategic Comprehensive Special Zone, by Fukuoka Prefecture in September 2012.



SiC power module

Corporate Enhancements to Strengthen Our Constitution

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 7,000 tons 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 thousand kWh (equivalent to 300 tons of CO₂).

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

The LCD Division uses night-time 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.

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.



Environment – Information Systems & Network Service Group

Overview

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

Mitsubishi Electric's Information Systems & Network Service Group consists of the Systems Integration Division as well as four operating companies: Mitsubishi Electric Information Systems Corporation, Mitsubishi Electric Information Technology 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 systems to corporate systems, to customers throughout the lifecycle, spanning from information and network systems conceptual planning to development, operation and maintenance.

Message from Senior Management

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 strategy and challenges of its customers, as well as its 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 impacts through the use of IT. Specifically, we are aggressively expanding our products and services that reduce environmental impacts, 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 BCP¹. 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.



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

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 M2M³ and Big Data.

1 BCP: Business Continuity Plan.

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

3 M2M (Machine-to-Machine): A computer network where connected equipment mutually exchange information without human involvement, to automatically optimize controls.

Products and Services Making a Difference

Using Data Centers to Help Customers Reduce Their Environmental Impacts

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 impacts 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. We have also 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. Using the information infrastructure inside our data centers, we provide an IaaS⁴ 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

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

Corporate Enhancements to Strengthen Our Constitution

Continuous Activities Aimed at Reducing Environmental Impacts

The offices and factories of our operating companies are working continuously to reduce their environmental impacts through energy-saving initiatives, sorting and reduction of 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 impacts 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 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 and by sustaining 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/coffee machines.