

# ECO

Mitsubishi Electric  
Group Environmental  
Sustainability Report

# 2007

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**The Mitsubishi Electric Group Environmental Sustainability Report 2007 communicates our philosophy and activities pertaining to environmental protection.**

**The first half of the report is divided into four sections: in our factories and offices, in our logistics operations, by helping customers and in our products.**

**These sections confront the increasingly serious problem of global warming.**

**The report's second half provides a summary of our performance in fiscal 2007.**

\*Details of our environmental sustainability actions can be found in English on our Global website at Corporate Social Responsibility: Environment Report

<http://Global.MitsubishiElectric.com/company/csr/index.html>

## Message

# Promoting Ongoing Improvements Based on an Environmental Mindset

As a manufacturing company, the targets set by Mitsubishi Electric when advancing environmental activities have much in common with targets for improving productivity or quality. The goals of reducing energy usage in production as much as possible and not using harmful substances in products are two examples. In



**Kenichiro Yamanishi,**  
Environmental Executive  
Officer

addition, environmental activities have a strong element of compassion—specifically, the desire to protect human life, the eco-system and the earth. Such compassion forms what can be referred to as an environmental mindset.

I believe that true environmental management makes this mindset the basis of action and promotes activities oriented toward the future of the earth and the life it sustains, while at the same time striving to achieve the economic objectives that society requires of a company. True environmental management becomes possible only when every employee possesses a highly aware environmental mindset and strives to achieve such goals in his or her daily activities.

Of all the environmental challenges we now face, the challenge of preventing global warming in particular has become a pressing priority throughout the world. Initiatives aimed at preventing global warming must be promoted in every aspect of corporate operations.

Fusing “top-down” and “bottom-up” initiatives is the most effective way to promote corporate strategy. The same holds true for environmental management. Top management must hammer out clear policies, formulate specific plans and carry out management on this basis. At the same time, all employees must foster a mindset and sensibility that befits people charged with promoting environmental management. Combining these initiatives will enable employees to bring their environmental mindset to bear in all business activities, ranging from development, production and sales to public relations, human resources and finance.

Such activities also define the sort of corporate group Mitsubishi Electric strives to become.

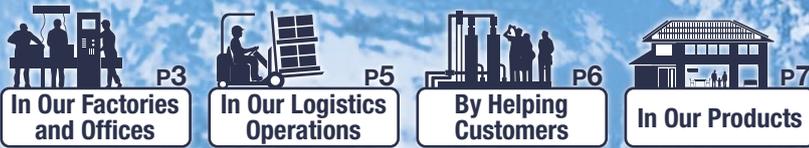
Max.

# 6.4°C



# Taking on the Challenge of Global Warming

In February 2007, the Intergovernmental Panel on Climate Change delivered its Fourth Assessment Report, indicating that the average temperature throughout the world had risen 0.74°C during the past 100 years. At the current rate of global warming, by the end of the 21st century average temperatures are forecast to be at least 1.1°C higher than current levels, possibly as much as 6.4°C higher. We believe it is the responsibility to those of us who conduct business on this planet to halt global warming. Based on this conviction, the Mitsubishi Electric Group is united in its efforts to reduce the emission of the gases responsible for the greenhouse effect.



Min. 1.1°C

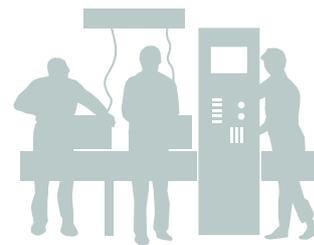


1900

2000

2100

# In Our Factories and Offices



In addition to producing environmentally friendly products at each of its manufacturing facilities, Mitsubishi Electric promotes thoroughgoing energy conservation activities. Here, we introduce the significant successes of two of our factories in their efforts to halt global warming.

## Promoting Energy Conservation: Mitsubishi Electric's Fukuyama Works is Developing and Manufacturing Ways to Reduce Power Consumption

Energy conservation depends on knowing current energy consumption. Making our energy consumption transparent so that real-time levels are clear based on manufacturing and/or infrastructure will simplify the identification of waste by allowing comparisons of operating levels and the efficiency of energy consumed. Our initiative in this regard is known as energy-loss minimization (EM) activities.

The Fukuyama Works is leading our initiative to develop and manufacture aids to reduce energy consumption, such as electricity monitors and other devices that allow us to measure energy usage. As part of our EM activities, we use our own

devices and systems at our production plants, thus verifying their efficacy. In addition to achieving many improvements and creating better ways to reduce energy consumption, we have accumulated extensive knowledge about energy conservation.

We have recently begun organizing tours at the Fukuyama Works to show customers our accomplishments in promoting energy conservation through our methods to reduce energy consumption. We apply these initiatives at our other manufacturing centers as well. In setting an example, the Fukuyama Works provides the impetus for energy conservation across the Mitsubishi Electric Group. Our plans call for expanding our EM activities through greater transparency in our energy use, from electricity to petroleum, thermal energy, natural gas, wind power and hydropower.



**Kuniaki Kondo**  
Manager, Marketing Department

The Mitsubishi Electric Group fully leverages the energy conservation methods developed at the Fukuyama Works on an energy-source basis. All have produced solid results. Although the performance of individual energy conservation methods can be demonstrated with experimental data, actual onsite use proves the operational benefits. We will continue striving to be a leader in the reduction of energy consumption in manufacturing.



Fukuyama Works



Energy management personnel referring to energy management monitoring screens (Fukuyama Works)



The EcoServer II server for energy conservation data



Displays at the Fukuyama Works showroom make energy conservation support systems easy to understand

## Air-Conditioning & Refrigeration Systems Works: Making Strides in Energy Conservation through the Unique “Environmental JIT” Initiative

Air-Conditioning & Refrigeration Systems Works leads our development and manufacturing of industrial air conditioners and freezer units, and is a superior facility in terms of energy conservation, consistently exceeding the Group’s annual targets by a wide margin by applying the Environmental “Just In Time” (JIT) initiative. Environmental JIT is common in manufacturing and the Air-Conditioning & Refrigeration Systems Works applies this concept as a symbol of its energy conservation initiatives. In other words, the works uses energy where, when and to the extent needed—nothing more. Environmental JIT also involves verifying energy usage and making improvements according to six criteria: “change”, “reduce”, “turn off”, “lower”, “repair” and “reuse”.

- “Change” refers to altering infrastructure, hardware and energy, as we replace machinery with more efficient models and transition to fuels with lower coefficients of carbon dioxide emissions.
- “Reduce” involves using devices or procedures only when necessary, such as reducing the amount of lighting in areas where people are not working.
- “Turning off” means eliminating wasteful operations, for example, “power-down conservation day”.
- “Lower” requires ratcheting down pressure levels or air-conditioning demand.
- “Repair” results in improved efficiency in energy use by fixing leaks in heating or air-conditioning systems.
- “Reuse” refers to such initiatives as collecting and reusing waste heat. The Air-Conditioning & Refrigeration Systems Works makes solid, significant strides in energy conservation by accumulating little actions, day in and day out.



Some of the examples displayed on an in-factory’s JIT improvement activity board (Air-Conditioning & Refrigeration Systems Works)



**Akira Hattori**  
Manager, Environment Control Section,  
Manufacturing Control Department

The Air-Conditioning & Refrigeration Systems Works inaugurated the Environmental JIT initiative in October 2004. The works strives to improve the degree and pace of environmental sustainability, chiefly through energy conservation and management of wastewater drainage and waste products. The heart of the initiative is to act now, that is, to quickly execute a 50% improvement immediately rather than wait to get a 100% improvement later. The works’ philosophy has firmly taken root and is making measurable gains in the degree and pace of improvements.



Combined reduction of energy consumption by shortening conveyors and through on-cart production

Factory wing roof coated with reflective paint to reduce the amount of power required for cooling

Lighting dimmed to conserve energy where no people are working

Air-Conditioning & Refrigeration Systems Works



Belts are used to tie down products packaged in cardboard boxes, which tend to shift during transport.



Airbags are used to package products tightly and eliminate excess air space.



Products are loaded into 31-foot containers, which can be loaded directly onto 10-ton trucks for delivery.



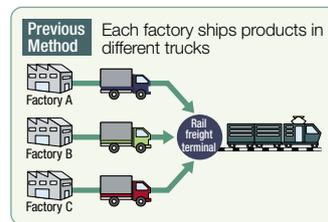
Containers with high ceilings are used to transport products stacked up to 2.4 meters.



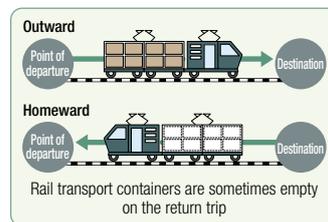
Three 12-foot containers, transported on flat-bed trucks, are easily packed into 40-foot shipping containers for oversea transport. The 12-foot containers can then be conveniently transported by rail at the other end of their ocean voyage.



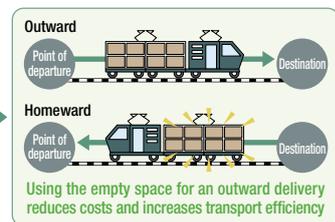
Containers with high ceilings are used to transport products stacked up to 2.4 meters.



Achieving cost savings by loading as many products as possible into a single container



Reducing costs by loading other companies' products into containers for the return trip



Previous Packaging



New Packaging



To cushion products against shock during shipment, we have designed a new type of packaging for semiconductor power modules, for which over-spec packaging is common. The new packaging cushions the modules at the corners—thereby maintaining the box shape—while using rolled cardboard materials. This compactness reduces cardboard material requirements by 51%.

## Promoting Eco-Logistics—Putting CO<sub>2</sub> Emission Reductions on an Equal Footing with Reductions in Distribution Costs

The Mitsubishi Electric Group strives for “Eco-Logistics” with regard to its distribution system. The purpose of the initiative is to build a distribution system that is inexpensive and environmentally sustainable by linking refinements in distribution with efforts to reduce the environmental impact. Key steps in this initiative include a modal shift from shipments by truck to shipments by rail and ship, which have a smaller environmental footprint, as well as more efficient packing that maximizes the volume of goods moved in a single shipment.

The modal shift expands our use of rail shipments by

leveraging 31-foot rail containers, which can carry loads normally conveyed by a 10-ton truck, as well as high ceiling containers that facilitate shipment of large products by rail. More efficient packing reduces CO<sub>2</sub> emissions in the product shipment stage. This greater efficiency is achieved primarily through re-examining the shapes of our products and packages, as well as re-engineering our packing methods. We are also reducing the volume of disposable packaging materials and using lighter-weight and more compact packaging in the earliest design and development stages of our products.

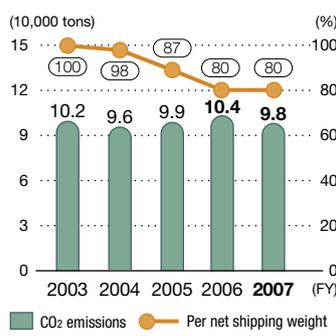
These measures immediately reduce distribution costs as well as lower the environmental impact, demonstrating that it is possible to achieve reductions in CO<sub>2</sub> emissions and decreased distribution costs.

# In Our Logistics Operations

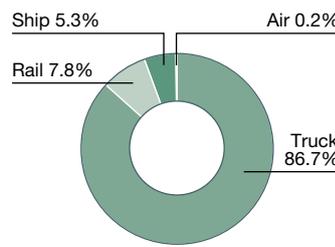
The Mitsubishi Electric Group is undertaking diverse measures with regard to manufacturing technologies to reduce CO<sub>2</sub> emissions in shipments as well as in disposable packaging materials.



### CO<sub>2</sub> Emissions per Net Shipping Weight from Logistics



### Fiscal 2007 Share of Transport by Mode



**T O P I C S**

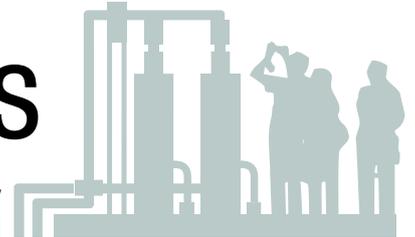
**Participation in Chinese Energy Conservation Forum**

Along with rapid economic growth, China is confronting an urgent need to secure adequate, reliable electricity. In March 2006, the National People's Congress wrote building a sustainable economy into the primary objectives of the country's 11th Five-Year Guidelines.

The 2007 High Level Forum on China's Energy Saving Industry was held on July 22, 2007, in Beijing, with just such considerations in mind. Mitsubishi Electric was on hand to present its energy conservation products and technologies, which drew considerable attention from forum participants.



# By Helping Customers



Proactive in its environmental management efforts, Mitsubishi Electric actively works to share with customers the technologies and expertise it has accumulated through its own energy conservation activities to elicit their support of efforts to promote energy conservation.

## Mitsubishi Electric Engages in Education about Energy Conservation, Makes Recommendations that Apply In-House Achievements in Energy Conservation to Business

Mitsubishi Electric is leveraging its accumulated technology and knowledge of energy conservation to offer a full range of services that assist customers in carrying out their energy conservation initiatives. One of our efforts is the "Energy Conservation Model Factory Tour," which showcases effective techniques and case histories of some successful implementations of energy conservation. In 2006, we began offering seminars on implementing energy conservation to offer information to our customers that can be easily turned into solutions.

Representatives of 22 companies attended our first seminar in implementing energy conservation, held at the Mitsubishi Electric production plants in Fukuyama and Nagoya. The seminar

showcased Mitsubishi Electric's energy conservation policies, procedures, systems and devices that highlight its accomplishments and engage customers in considering the problems. Attendees were amazed that we would be so open with other companies about such matters. During the lectures, we gave advice about such matters as how transparency and comprehension through managing energy use on a per-energy-source basis, which is the foundation of promoting energy conservation, leads to greater productivity. Other aspects of the seminar that attendees found useful included discussions with customers that revealed differences in hardware and data analysis required by various industries and business sectors.

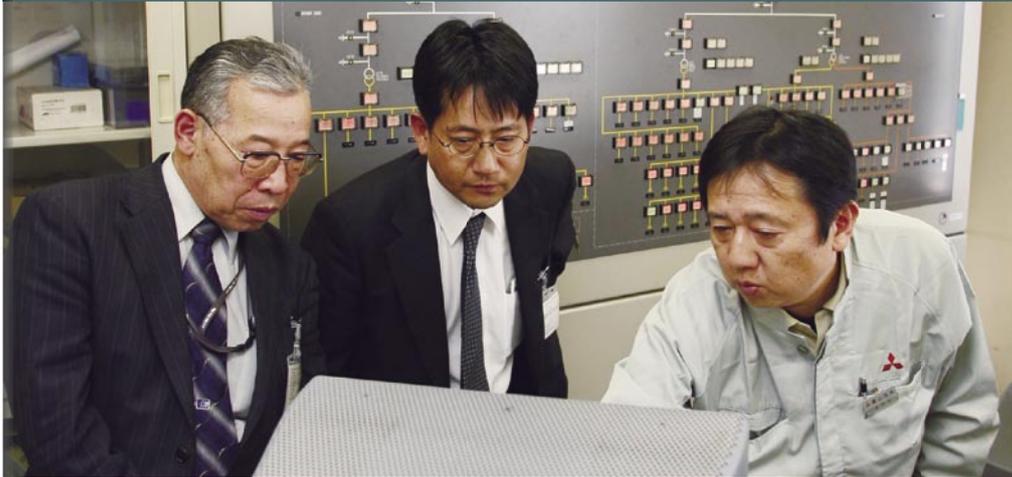
Exchanging information in this manner is an enterprise-level initiative to put contributions to preventing global warming on an equal footing with Mitsubishi Electric's business. We will conduct similar exchanges on an ongoing basis.



Lecture at an energy conservation seminar



Plant tour showcasing energy conservation



At a client site, reviewing actual data and offering advice about management on a per-unit basis

## A Customer and Seminar Attendee Comments



**Hiroshi Okuyama**  
Manager, Control Department  
Mizushima Plant  
Mitsubishi Motors Corporation

The energy conservation seminar was an extremely interesting experience. The format was not based on the teacher-student dichotomy; rather there was an atmosphere that encouraged people to ask questions and state their opinions. I came away with the expectation that this experience would lead to additional discussions with managers of other companies in the same industry and different industries.

**In addition to using thermal data to detect floor temperatures, the human-sensing energy conservation sensor automatically determines where people are located.**

Through left-right movement, the human-sensing energy conservation sensor searches from one corner of the room to the other. From heat image data, the device locates people and properly determines the floor temperature.



Measurement starts from the left side of the room.



The eye measures as it moves.



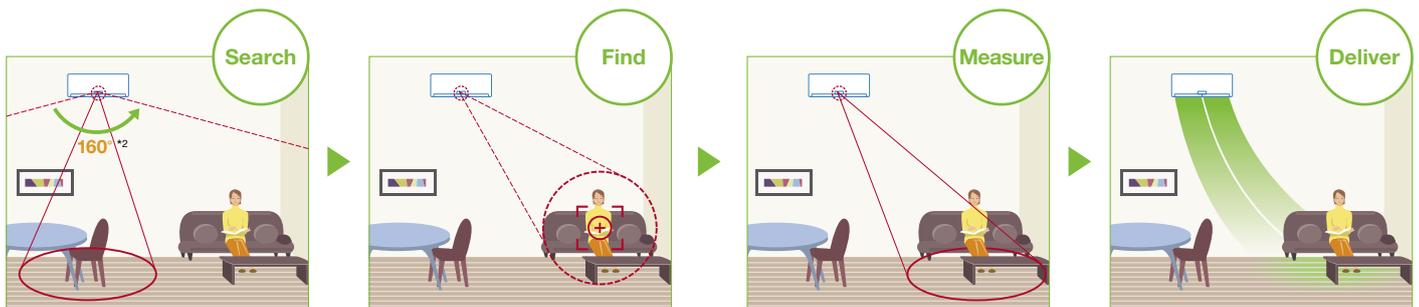
Measurement concludes at the right side of the room.



The eye returns to the left side.



\*Chart shows an artist's rendition.



## Taking into Account the Way Products Are Used as a New Way of Enhancing Energy Conservation Functions

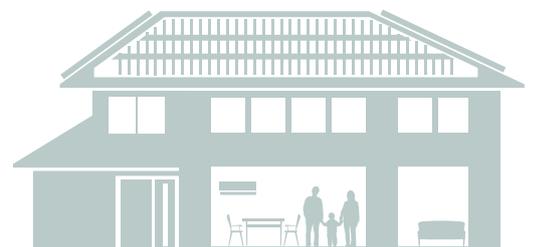
Energy efficiency changes by about 10% for each degree Celsius the preset temperature is raised or lowered, so the way in which an air conditioner is used can make great changes to energy consumption. Air conditioners have conventionally been developed to air condition the entire room, but Mitsubishi Electric looked at how air conditioners are used in order to further improve their energy efficiency. Mitsubishi Electric has developed a sensor that simultaneously detects the location of people in a room and the floor temperature. Appropriate air circulation prevents temperature pockets and surmounts the conventional issue of air conditioners, such as cold feet in

heating mode, overcooling in cooling mode and the airflow not going to the right place. Mitsubishi Electric's sensing technology helps ensure air conditioning systems that deliver comfort, but with automatic controls to prevent electricity from being wasted.

An automatic cleaning mechanism prevents the buildup of dust in the filter and the accumulation of dirt and mold inside the unit, all factors that increase energy consumption, and an "ozone shower" feature limits the occurrence and growth of mold on the inside of the unit using low-density ozone. We succeeded in substantially improving energy efficiency while ensuring comfort by these innovations for keeping the air conditioner completely clean. Mitsubishi Electric is developing air conditioners thinking about energy savings and comfort ten years ahead.

# In Our Products

Mitsubishi Electric strives to deliver products for home and commercial use that reduce power consumption and develop new energy systems that contribute to the prevention of global warming. Here we introduce examples: air conditioner and photovoltaic power system.





Our photovoltaic power generation system in use at TDK Corporation's Kofu Plant



### Comments from a Customer Using Our Photovoltaic Power System

**Kenji Morino**

Leader (Senior Manager), Environment Project, Data Storage & Thin Film Technology Components Business Group, Kofu Plant, TDK Corporation

In the area of preventing global warming, we are actively working to utilize solar energy, alongside measures to reduce the size of products, decrease process numbers, and improve the energy efficiency of production facilities. Regarding the 100kW Mitsubishi Electric system installed at our Kofu Plant, the amount of power produced by Mitsubishi Electric's system in fiscal 2007 was 107% of forecasts, which were based on meteorological data from the past 30 years. We graded the system as demonstrating maximum efficiency, which included the match with the power conditioner. We realize that this was partly because of the good weather we enjoyed during the year, but in 2007 the system delivered 116% of forecast capacity.

### Popularizing Photovoltaic Power Generation: A Clean Source of Energy With No CO<sub>2</sub>

Photovoltaic power generation involves creating electricity from solar energy. Such systems are a clean source of energy, meaning that power generation does not give off CO<sub>2</sub>, the cause of global warming. Photovoltaic power generation is an effective system for putting an end to global warming, and efforts have now turned to increasing its use around the world.

As a manufacturer engaged in start-to-finish production, Mitsubishi Electric has been working to increase generating efficiency for the entire system, from solar cells to power conditioners. With a photovoltaic module, which convert solar energy from the sun into electricity (direct current), polycrystalline silicon solar cells provide a conversion efficiency of 18%\*<sup>1</sup>, the

highest in the industry\*<sup>2</sup>. Output per photovoltaic module is 185W, also the highest in the industry. A photovoltaic inverter, which converts the direct current produced by the module into alternating current, uses a fifth-generation intelligent power module developed by Mitsubishi Electric to deliver power conversion efficiency of 95.5%, the highest in the industry\*<sup>3</sup>. Mitsubishi Electric is working to improve the performance of these devices.

Mitsubishi Electric has created a lineup of photovoltaic modules that can be attractively installed on roofs of various shapes and types in order to increase the number of places where photovoltaic power systems can be installed. Mitsubishi Electric became the world's first company to use electric discharge slicing method which will play a major role in processing ultrathin silicon substrates. We are developing technologies to use silicon materials efficiently.

### TOPICS

#### Installing a Photovoltaic Power System at a School in Cambodia in Need of Electricity

The main goal for the system was to supply power that was needed for the school to begin computer classes. Once the system was up and running, the opportunity to touch a computer for the first time in their lives filled the students with joy. The teachers were also very appreciative of the project, commenting that learning about computers would be extremely valuable for the children's futures.



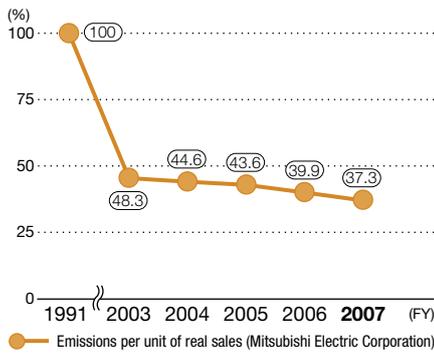
\*<sup>1</sup> Findings of an evaluation done by the National Institute of Advanced Science and Technology, a public certification body for conversion efficiency.

\*<sup>2</sup> As of August 22, 2007; Mitsubishi Electric survey.

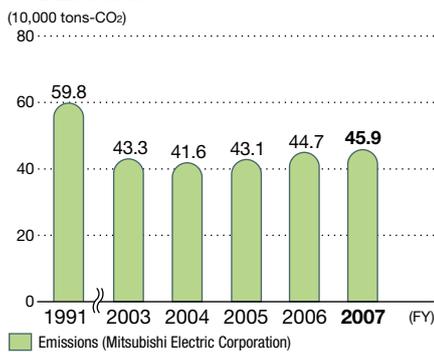
\*<sup>3</sup> As of August 22, 2007; Mitsubishi Electric survey, PV-PN22G model. Electric power conversion efficiency of home power conditioner in Japan.

# We appear likely to achieve our CO<sub>2</sub> emission reduction targets three years early, and we aim to achieve even more stringent targets.

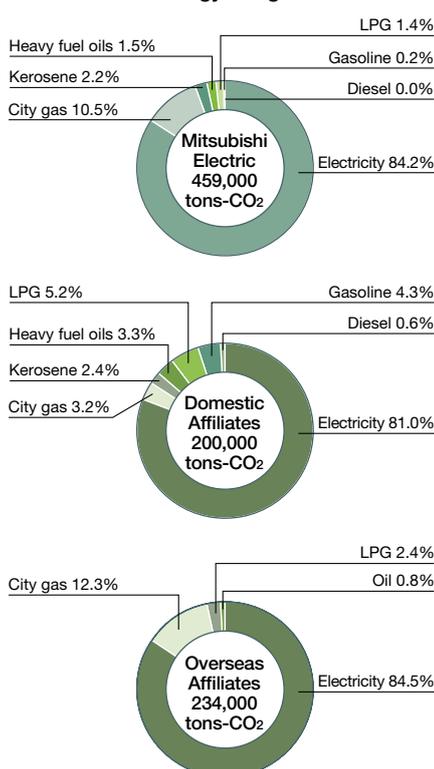
Emissions Per Unit of Real Sales



CO<sub>2</sub> Emissions



Breakdown of Energy Usage



## Promoting an Action Plan to Invest 0.1% of Net Sales in Energy Conservation

In 1997, Mitsubishi Electric established a target of reducing CO<sub>2</sub> emissions on a net sales basis to at least 25% of the fiscal 1991 level by fiscal 2011. Our action plan to accomplish this goal consists of three primary aspects: installing highly efficient hardware, the energy-loss minimization (EM) activities and changing the fuels we use. Mitsubishi Electric has instituted a policy of making annual investments of 0.1% of net sales in energy conservation infrastructure. In fiscal 2007, we invested ¥2,662 million and reduced CO<sub>2</sub> emissions by 10,052 tons (table below), corresponding to 2.2% of our emissions in the previous fiscal year. Since fiscal 2005, we have invested ¥5,787 million and reduced CO<sub>2</sub> emissions by 22,746 tons. Preliminary calculations of CO<sub>2</sub> reductions that we could achieve through the investment plan for the current fiscal year suggest we can achieve our target three years early, by the close of fiscal 2008. We will continue these investments and aim at annual reductions of 10,000 tons of CO<sub>2</sub>.

## Changing from Management Indices to an Actual Net Sales Unit Base, Taking on the Challenge of Increasingly Demanding Targets

In fiscal 2007, Mitsubishi Electric's manufacturing processes emitted 459,000 tons of CO<sub>2</sub>. In terms of net sales unit base\*<sup>1</sup>, these emissions were 76.8% (23.2% reduction) of the total for fiscal 1991. Having approached our overall targets through energy conservation investments, as mentioned we have opted to change CO<sub>2</sub> reductions from management indices to a base of units of actual net sales\*<sup>2</sup> and set new targets beginning in fiscal 2008.

The actual net sales unit base is an index for eliminating the variance between the manufacturer's suggested retail price and market price that results from price fluctuations. This index allows stricter assessment of CO<sub>2</sub> emissions per quantity of manufactured product. Beginning in fiscal 2008, we will employ this index to achieve an even stricter target than before: to reduce CO<sub>2</sub> emissions to 40% (60% reduction) of the fiscal 1991 level by fiscal 2011 in terms of actual net sales. By this measure, estimating fiscal 2007 performance produces a result of 63% of fiscal 1991 emissions.

\*<sup>1</sup> The volume of CO<sub>2</sub> emissions divided by net sales

\*<sup>2</sup> The volume of CO<sub>2</sub> emissions divided by actual net sales for a given fiscal year adjusted for the Corporate Goods Price Index (CGPI)

Progress of Action Plans for Energy Conservation

Action Plan	Fiscal 2011 Reduction Target (tons-CO <sub>2</sub> )	Fiscal 2005		Fiscal 2006		Fiscal 2007	
		Reduction (tons-CO <sub>2</sub> )	Investment (Millions of yen)	Reduction (tons-CO <sub>2</sub> )	Investment (Millions of yen)	Reduction (tons-CO <sub>2</sub> )	Investment (Millions of yen)
Introduction of high-efficiency equipment	34,800	4,098	1,443	5,910	1,468	8,842	2,481
EM initiatives	8,000	214	41	266	76	890	156
Fuel conversion	3,200	1,872	48	334	49	320	25
<b>Total</b>	<b>46,000</b>	<b>6,184</b>	<b>1,532</b>	<b>6,510</b>	<b>1,593</b>	<b>10,052</b>	<b>2,662</b>
<b>Cumulative</b>	<b>-</b>	<b>6,184</b>	<b>1,532</b>	<b>12,694</b>	<b>3,125</b>	<b>22,746</b>	<b>5,787</b>

# Material Balance

Period of Data Compilation: April 1, 2006–March 31, 2007  
 Scope of Data Compilation: Mitsubishi Electric Group (Mitsubishi Electric Corporation's production facilities in Japan, 79 affiliates in Japan, and 22 affiliates overseas)

## IN

Materials for Manufacturing			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Materials*1	460,000 tons	120,000 tons	230,000 tons
Manufacturing			
Electricity	915 million kWh	385 million kWh	273 million kWh
Natural gas	23,400,000 m <sup>3</sup>	3,160,000 m <sup>3</sup>	14,100,000 m <sup>3</sup>
LPG	2,180 tons	3,430 tons	1,840 tons
Oil (crude oil equivalent)	6,710 kℓ	8,060 kℓ	691 kℓ
Water	6,830,000 m <sup>3</sup>	2,400,000 m <sup>3</sup>	1,530,000 m <sup>3</sup>
Surface water	1,440,000 m <sup>3</sup>	720,000 m <sup>3</sup>	370,000 m <sup>3</sup>
Industrial water	2,450,000 m <sup>3</sup>	430,000 m <sup>3</sup>	1,060,000 m <sup>3</sup>
Groundwater	2,930,000 m <sup>3</sup>	1,250,000 m <sup>3</sup>	20,000 m <sup>3</sup>
Others	0 m <sup>3</sup>	0 m <sup>3</sup>	90,000 m <sup>3</sup>
Reuse of Water	2,780,000 m <sup>3</sup>	1,700,000 m <sup>3</sup>	50,000 m <sup>3</sup>
Controlled chemical substances (amounts handled)	5,204.7 tons	2,153.3 tons	5,085 tons
Ozone depleting substances (amounts handled)	62.0 tons	0.4 tons	0 tons
Greenhouse gases (amounts handled)	277.3 tons	136.2 tons	216 tons
Volatile Organic Compounds (amounts handled)	1,505.6 tons	1,042.5 tons	194 tons

\*1 Materials: Total of shipping weight of Eco-Products, plus product packing plus waste disposal

## OUT

Emissions			
	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Water	5,790,000 m <sup>3</sup>	158 m <sup>3</sup>	115 m <sup>3</sup>
Controlled Chemical substances	12.1 tons	1.7 tons	0.0 tons
BOD (biological oxygen demand)	108.4 tons	4.9 tons	61.4 tons
COD (chemical oxygen demand)	40.1 tons	5.4 tons	68.5 tons
Nitrogen	67.1 tons	16.8 tons	3.0 tons
Phosphorus	4.9 tons	0.5 tons	0.0 tons
Suspended solids	85.7 tons	3.7 tons	92.9 tons
n-hexane extracts (mineral)	3.6 tons	0.3 tons	0.0 tons
n-hexane extracts (active)	4.2 tons	0.0 tons	0.0 tons
Total emissions of zinc	3.1 tons	0.1 tons	0.0 tons
Carbon dioxide (CO <sub>2</sub> )	459,000 tons-CO <sub>2</sub>	200,000 tons-CO <sub>2</sub>	234,000 tons-CO <sub>2</sub>
Controlled Chemical substances (excluding amounts contained in other waste)	714.1 tons	101.5 tons	13.6 tons
Volatile organic compounds (toluene, xylene, styrene)	662.4 tons	85.2 tons	14.2 tons
Greenhouse gases	138,000 tons-CO <sub>2</sub>	120,000 tons-CO <sub>2</sub>	0.00 tons-CO <sub>2</sub>
Ozone depleting substances	0.015 ODPt	0.375 ODPt	0.00 ODPt
Sulfur oxide (SO <sub>x</sub> )	1.3 tons	1.0 tons	0.10 tons
Nitrogen oxide (NO <sub>x</sub> )	39.2 tons	3.2 tons	1.1 tons
Dust	1.7 tons	1.8 tons	1.5 tons
Amount of CFCs recovered	31.43 tons	224.21 tons	–
Waste			
Total waste emissions	86,031 tons	61,900 tons	54,190 tons
Volume recycled	74,480 tons	49,428 tons	47,023 tons
Waste treatment subcontracted out	5,110 tons	1,622 tons	7,167 tons
Final disposal	238 tons	850 tons	3,680 tons
Weight reduction in-house	5,093 tons	0 tons	0 tons
Product*2			
Weight of all Eco-Products sold	333,000 tons	49,000 tons	150,000 tons
Weight of packaging materials	41,000 tons	0.9000 tons	22,000 tons

\*2 Products: Weight related to Eco-Products

## Selling and Distribution

	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Fuel for trucks (gasoline)	49 kℓ	3,100 kℓ	34 kℓ
Fuel for trucks (diesel)	26,000 kℓ	6,365 kℓ	21,265 kℓ
Fuel for rail (electricity)	1,540 MWh	351 MWh	0 MWh
Fuel for marine transport (bunker oil)	470 kℓ	100 kℓ	5,515 kℓ
Fuel for air transport (jet fuel)	405 kℓ	135 kℓ	5,970 kℓ

## Logistics

## Selling and Distribution

	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Carbon dioxide (CO <sub>2</sub> )	72,000 tons-CO <sub>2</sub>	26,000 tons-CO <sub>2</sub>	152,000 tons-CO <sub>2</sub>

## Energy Consumption\*3

	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Electricity*3	7,960 million kWh	3,890 million kWh	18,620 million kWh

\*3 Energy Consumption, Electricity: Amount related to Eco-Products

## Products (Customer)

## Emissions\*4

	Mitsubishi Electric	Affiliates (Japan)	Affiliates (Overseas)
Carbon dioxide (CO <sub>2</sub> )	3,359,000 tons-CO <sub>2</sub>	1,642,000 tons-CO <sub>2</sub>	–

\*4 Emissions, Carbon Dioxide (CO<sub>2</sub>): Amount related to Eco-Products

## Products at End of Life\*5

	Mitsubishi Electric
Air conditioners	10,111 tons
Televisions	8,477 tons
Refrigerators	18,192 tons
Washing machines	6,022 tons
Personal computers	161 tons

\*5 Products at End of Life: 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

## Recycle

## Resources Recovered\*6

	Mitsubishi Electric
Metals	23,220 tons
Glass	3,457 tons
CFCs	103 tons
Others	6,670 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

## Integrated Management System Based on the Environmental Plan

Under Mitsubishi Electric's 5th Environmental Plan, which went into effect in fiscal 2007, we are working toward the integrated operation of environmental management systems (EMS) at our business sites by sharing the goals stated in the plan with the entire Mitsubishi Electric Group.

At our head office and branches, we launched integrated EMS operations when updating systems to meet the requirements of ISO 14001:2004 in March 2006. For the environmental management systems at our manufacturing works, plants and research centers, in fiscal 2007 we identified issues pertaining to integrated operations at the head office and manufacturing works and considered solutions. Our goal is to launch integrated operations for these sites by the end of fiscal 2009.

In addition, by extending environmental management to non-production sites, we will manage environment-related work in an integrated manner for all traditional business activities: materials procurement, product design, manufacturing, sales and recycling.

### 5th Environmental Plan Overview

#### Enhancing Environmental Management on a Global, Consolidated Basis and Fulfilling Corporate Social Responsibilities Thoroughgoing Defense

- Comply with laws and regulations, and ensure thoroughgoing management to this end
- Incorporate the core business processes of each business group—product development, manufacturing, sales, etc.—into the environmental management system (ISO14001:2004) and carry out improvement activities
- Double the number of key environmental personnel (employees directly involved in environmental issues) by enhancing training programs
- Strengthen preventive maintenance measures by revamping environmental facilities

#### Improving Environmental Performance Together with Stakeholders Defensive and Proactive Measures

- Strengthen initiatives down the entire supply chain, from development and design to procurement, production, delivery and waste processing
- Continue investing in energy efficiency with a goal of 0.1% of production value and reduce carbon dioxide emissions by 25% by fiscal 2011 (compared to fiscal 1991) by making energy loss readily apparent
- Construct an internal certification system for eco-factories and eco-offices by developing guidelines for them

#### Enhancing Environmentally Beneficial Businesses Developing New Offensive Initiatives

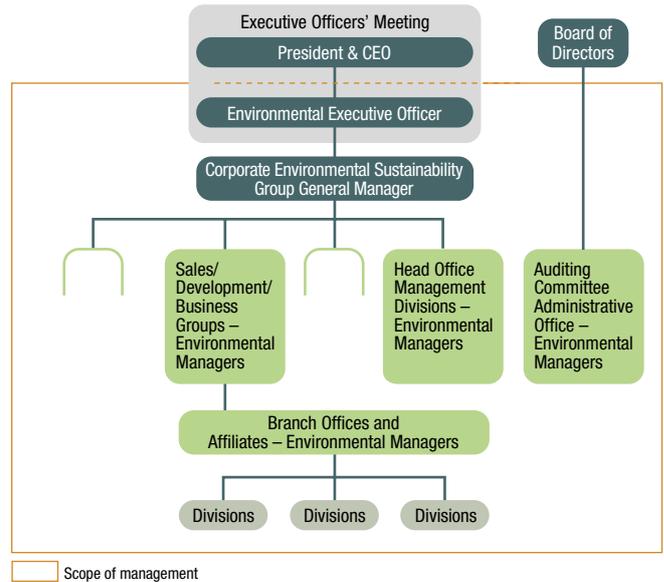
- Install Mitsubishi Electric eco-products at the company, and leverage the acquired know-how and energy conservation in environmentally-beneficial business (expand environmentally-beneficial business to ¥100 billion by fiscal 2011 while putting global markets into consideration)

## Improving Environmental Education and Environmental Awareness

Environmental education at the Mitsubishi Electric Group takes place along two axes: general environmental education for specific career stages and specialized training for specific jobs. Employees of Mitsubishi Electric and our domestic affiliates are subject to these educational programs. Career stages are categorized into new hires, section managers, management and overseas appointments. Job-specific training consists of educational programs for environmental management, materials, product design, manufacturing and sales divisions. In fiscal 2007, Groupwide some 30,000 employees attended in-house training courses.

Training for environmental management divisions focuses on training environmental specialists; specifically, key environmental personnel and environmental auditors. In fiscal 2007, the number of employees who had completed key environmental personnel training increased to 23.

## Organization Chart for Environmental Management



## Mitsubishi Electric Group EMS Harmonization



### Training Nature Conservation Leaders to Promote Mitsubishi Electric Outdoor Classroom

Since fiscal 2007, Mitsubishi Electric has been working with the Japan Outdoor Life Promotion Society to train leaders in nature conservation. Employees who serve as leaders hold Outdoor Classroom in their areas, and they and their families can experience the outdoors through observing nature, cultivating concern for the environment and expanding the circle of conservational awareness.



**Class 1: Learning the Cycles of Nature (Hibiya Park, Tokyo)**

Attended by 19 pupils in the Yuri class (older pupils) of Taimei Kindergarten.



**Class 2: Observing Life in the Sea (Yanashi Beach, Utsumi-cho, Minami Chita, Aichi Prefecture)**

Attended by 49 children, aged three through 10, of Mitsubishi Electric employees.



**Class 3: Observing the Spring Fields (Sanda Woody Town Chuo Park, Hyogo Prefecture)**

Nature study during a family hiking expedition, attended by 19 employees and their families.



**Class 4: Learning the Cycles of Nature (Hibiya Park, Tokyo)**

Attended by 17 pupils of the Ume class (older pupils) of Taimei Kindergarten.

## Design for the Environment, Eco-Products and Hyper Eco-Products

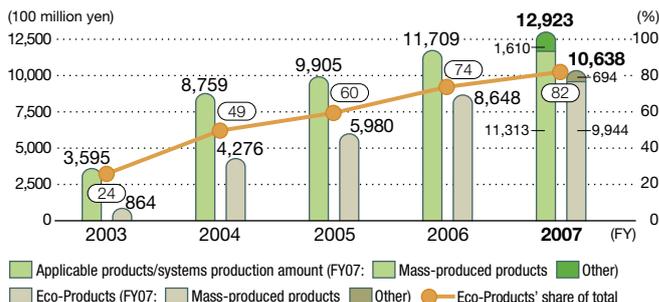
The Mitsubishi Electric Group has carried out the Design for the Environment (DFE) program to reduce the environmental impact of products for entire product lifecycles. When products targeted by this program achieve an exceptional level of environmental friendliness based on their Factor X assessments, an indicator for improving environmental efficiency, they are certified as Eco-Products or Hyper Eco-Products. Hyper Eco-Products have even more prominent environmental features than Eco-Products.

In fiscal 2007, 79 product groups were covered by the Design for the Environment program. Of these, the Eco-Products ratio (which is based on production amount) was 82%, while 42 products were certified as Hyper Eco-Products.

The Group has completely eliminated use of the six hazardous substances\*1 regulated by the EU RoHS Directive (enforced July 2006) as of December 2005.

\*1 The six hazardous substances are lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE).

## Emissions Per Unit of Real Sales



## The Concept of Design for the Environment



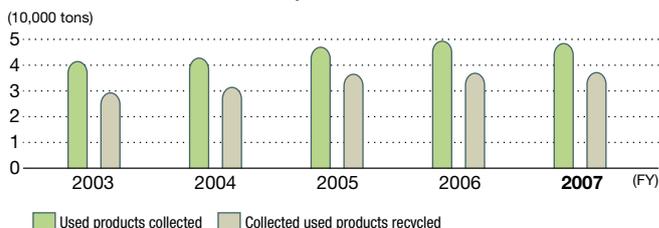
## Recycling Used Products

Mitsubishi Electric has recycled air conditioners, televisions, refrigerators/freezers and washing machines (the four types of home appliances), as well as office equipment and other items, a total of approximately 295,000 tons (as of March 2007). Information on dismantling and sorting obtained through this process has been communicated back to product design divisions to improve recycling and resource reuse ratios.

### •Four Types of Home Appliances (air conditioners, televisions, refrigerators/freezers and washing machines)

In fiscal 2007, we recycled 1.06 million home appliances in the four categories (98% of last year's level) while the recycling ratio was 78%.

## Collection Volumes for Principal Products



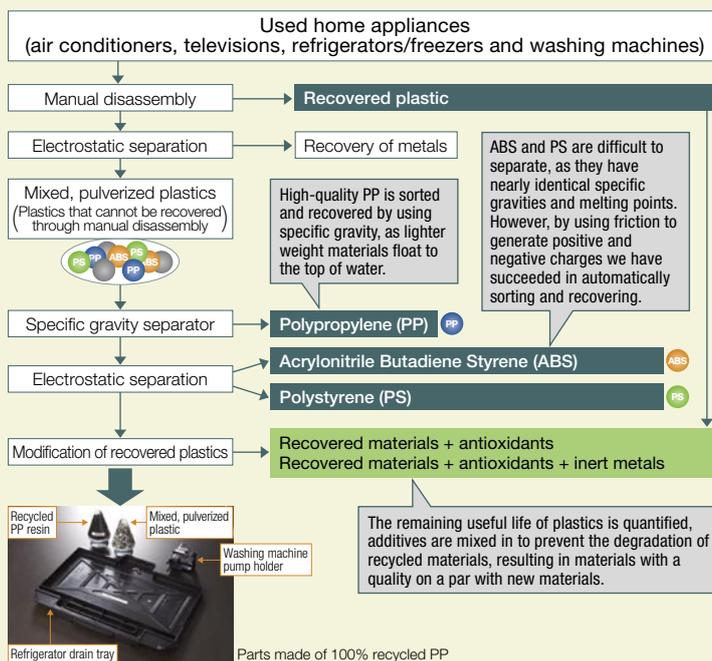
### •Personal Computers

In fiscal 2007, we collected a total of 10,682 home and office computers, which represented a recycling rate of 74%.

## Plastic Recycling Technologies: Striving to Use 100% Recyclable Materials

If we could completely recycle plastic from used appliances, we could contribute to a sustainable economy and would not need new material resources for new products. At present, however, recovered plastics are typically only recycled in a downgraded state because of the difficulty in separating different types of plastic in their fragmented, post-dismantling state. The resulting quality of the recovered plastic is thus degraded, due chiefly to oxidation.

These problems hinder a fully sustainable economy. Accordingly, Mitsubishi Electric applies a separation technology that takes advantage of different materials' specific weights and charging characteristics and a reforming technology that optimally combines additives to prevent degradation of the plastic. As a result, in May 2006 Mitsubishi Electric successfully produced the first products made of 100% selected recycled materials in the appliance industry.



## Reducing the Release of Chemical Substances

The Mitsubishi Electric Group has been managing chemical substances on a voluntary basis. We currently manage a total of 580 substances: 354 PRTR-designated substances\* and 226 others managed voluntarily. These include refrigerant fluorocarbons (HFC and HCFC) used in air conditioners and refrigerators, volatile organic compounds, and the six RoHS substances. The list of chemical substances subject to management increased by 13 in fiscal 2007 due to amendments made to the Air Pollution Control Law.

Correspondingly release and transfer volume for fiscal 2007 increased by 38% (11% increase based on last year's scope of management). We intend to continue to work to reduce the release of chemical substances, especially volatile organic compounds, one of the top ten chemical substances in terms of release and transfer volume.

\*PRTR: Pollutant Release and Transfer Register

## Waste Reduction and Zero Emissions Initiatives

Under our 5th Environmental Plan, we are working toward reducing waste completely and have set targets of 0.5% or less at production sites in Japan, and 1% or less at production affiliates in Japan.

In fiscal 2007, our domestic production plants achieved a figure of 0.29%, their fifth straight year of being at 1% or less, and their third consecutive year at 0.5% or less. Our domestic production affiliates improved from 2.4% in the previous year to 1.06%. We will redouble our efforts in the final year of the plan to reach 1% or less.

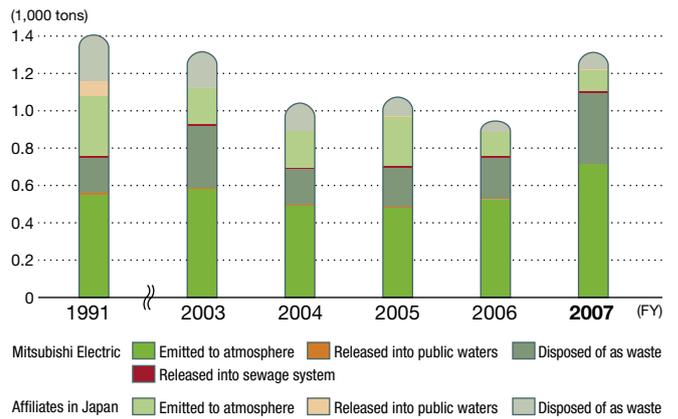
Overseas business offices reduced both total waste volume and final disposal volume, but unfortunately the final disposal ratio increased by 0.7 percentage points to 6.8%.

## Effective Water Usage

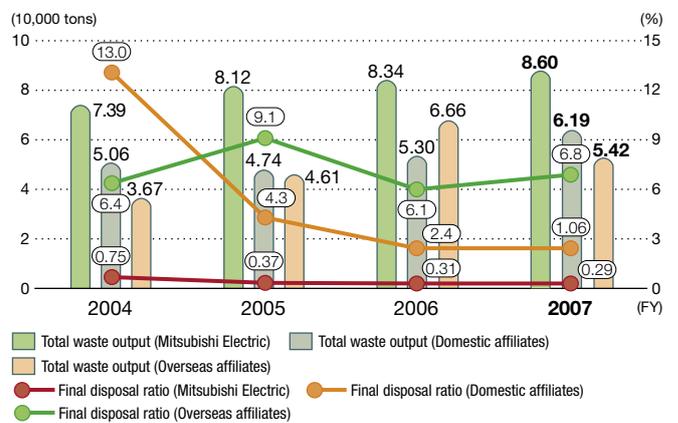
The Mitsubishi Electric Group is re-investigating and reconfirming how water is used, and is working to formulate and promote measures for more effective water usage. The goal of this initiative is to promote recycling and reuse of precious water resources, including public water, industrial water and groundwater.

In fiscal 2007, manufacturing plants, research centers and the Corporate Environmental Sustainability Group joined together to conduct water usage surveys at Nagoya Works and Nakatsugawa Works and consider ways to reuse water for toilets and fire prevention. In fiscal 2008, we will consider more specific measures to make this happen and extend the scope of water usage surveys and reuse initiatives to additional production sites.

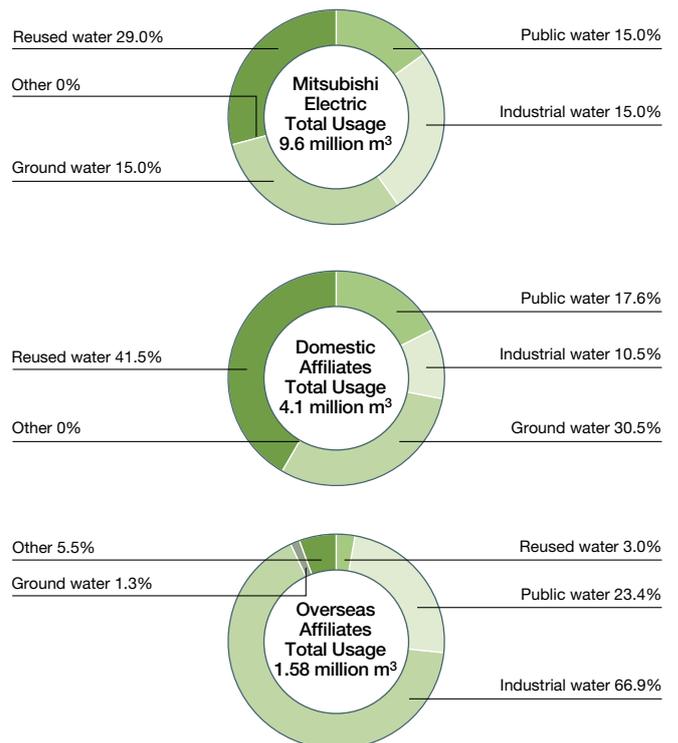
### Chemical Substance Releases and Transfers



### Total Waste Output



### Water Usage Overview



## Environmental Accounting

Period: April 1, 2006 – March 31, 2007 Scope of Data Compilation: Mitsubishi Electric Corporation and 101 of its domestic and overseas affiliates and subsidiaries (79 domestic, 22 overseas)

■ Mitsubishi Electric Group □ Mitsubishi Electric (100 million yen)

Environmental Protection Costs					
Item	Capital Investment	Costs	Total	Year-on-Year Change	Main Costs
Business Area Activities	44.0 23.6	56.3 37.2	100.3 60.8	20.5 11.7	
Pollution Prevention	13.8 4.4	20.9 14.5	34.7 18.9	6.2 2.9	Wastewater treatment (facilities, expenditure), deodorization (facilities, expenditure), vehicle replacement (investment)
Global Environmental Protection	28.2 19.1	4.0 2.6	32.2 21.7	11.4 8.7	Capital investment to upgrade air conditioners, upgrade transformers, convert to battery-operated forklifts, and install energy efficient production lines
Resource Recycling	2.0 0.1	31.4 20.1	33.4 20.2	2.9 0.0	Contracting out waste processing (expenditure), reduced use of wood packing materials (expenditure), contacting out product scrap recycling (expenditure)
Green Purchasing/Procurement and Product-Related Activities	14.3 9.4	7.6 6.6	21.9 16.0	(4.4) (9.3)	Installation of production facilities for energy efficient products (investment), conversion to compliant materials for products not subject to the EU's RoHS Directive (expenditure)
Management Activities	0.1 0.0	35.4 24.4	35.5 24.4	6.9 2.3	Expenditure on training for environmental auditors at affiliates, personnel costs for environmental staff, disclosing environmental information, greening business sites, etc.
Negative Environmental Impact Reduction and R&D Activities	2.0 1.7	36.9 28.9	38.9 30.6	8.3 0.2	Development costs for advanced devices for sorting waste plastics, development costs for inverter control power modules, development costs for energy efficient air conditioning and refrigeration, development for resource efficiency at power distribution facilities, development of technologies for limiting emission of air polluting gases, etc.
Community Activities	0.0 0.0	1.1 1.0	1.1 1.0	0.8 0.9	Expenditure on offsite cleanup activities, environmental communication activities, etc.
Environmental Damage	0.0 0.0	1.5 1.3	1.6 1.3	(1.3) 0.3	Expenditure on soil remediation measures and groundwater pollution measures
Total	60.4 34.7	138.8 99.4	199.3 134.1	30.8 6.1	
Year-on-Year Change	21.8 10.4	9.0 (4.3)	30.8 6.1		

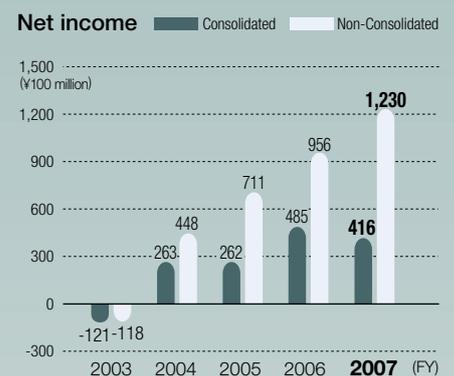
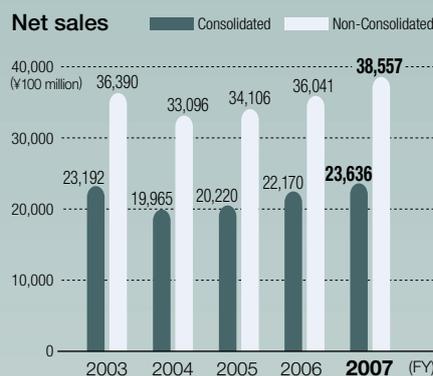
Environmental Conservation Benefits (Amount of Materials)					
Item	Unit	Fiscal 2007	Year-on-Year Change	Year-on-Year Per Net Sales	
Total Energy Used	10,000 GJ	1,463	(2)	93%	
		1,026	(14)	93%	
Total Water Used	10,000m <sup>3</sup>	923	12	95%	
		683	8	95%	
Total Greenhouse Gas Emissions	10,000 tons-CO <sub>2</sub>	170	69	157%	
		91	22	124%	
Total Atmospheric Emissions of Chemical Substances	tons	816	164	117%	
		714	190	128%	
Total Water Discharged	10,000m <sup>3</sup>	737	11	95%	
		579	19	97%	
Total Discharge of Chemical Substances in the Water and Soil	tons	4	(2)	64%	
		2	0	104%	
Total Waste Discharged	tons	147,931	11,453	101%	
		86,031	2,593	97%	
Final Disposal	tons	1,088	(435)	67%	
		238	(17)	88%	
Total Discharge of Chemical Substances in Waste	tons	473	190	156%	
		387	164	162%	

Economic Benefits from Environmental Protection Activities (Real Benefits)			
Item	Amount	Year-on-Year Change	Main Benefits
Earnings	29.4	10.5	Gains on sales of waste metal and waste plastic
	17.7	8.1	
Savings	31.9	8.4	Reduced material costs from converting to energy efficient product production, reduced use of packaging materials, reuse of parts (recycling management), reduced use of chemicals
	18.7	2.5	
Total	61.3	18.9	
	36.4	10.6	

Economic Benefits from Environmental Consideration in Products and Services		
Item	Amount	Main Products
Customer Economic Benefits	914.9	Refrigerators, air conditioners, total heat exchange ventilators (Lossnay), energy efficient lamps, energy efficient electrical discharge machines, elevators with inverters, photovoltaic power systems
	872.7	
Environmental Improvement Effects	29.9	
	29.0	

## Corporate Profile (As of March 31, 2007)

Company Name: Mitsubishi Electric Corporation  
 Headquarters Location: Tokyo Building, 2-7-3, Marunouchi, Chiyoda-ku, Tokyo 100-8310, Japan  
 Established: January 15, 1921  
 Paid-in Capital: ¥175,820 million  
 President: Setsuhiro Shimomura  
 Number of Employees: Consolidated: 102,835  
 Non-consolidated: 27,701  
 Number of Affiliated Companies: Subsidiaries: 148 Affiliates: 43  
 Business Segments: Energy and Electric Systems, Industrial Automation Systems, Information and Communication Systems, Electronic Devices, and Home Appliances



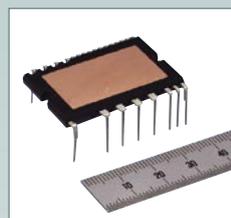
Machine-Room-Less Elevator, AXIEZ



Programmable Logic Controllers



Superbird 7 Communication Satellite

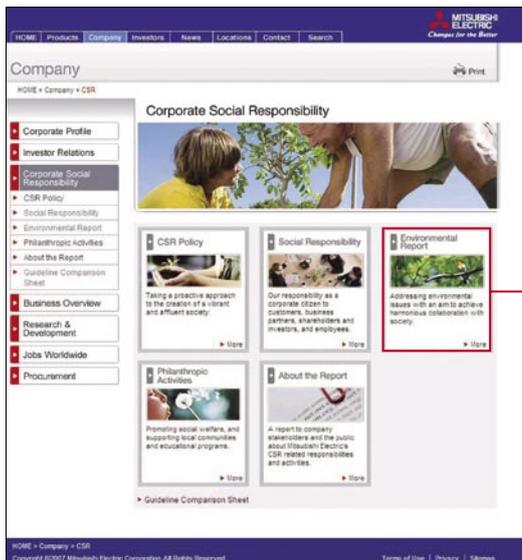


DIP-IPM Ultra-small Package Version 4 Series



UNI&ECO Home Appliances

# Mitsubishi Electric Group Environmental Information Disclosure



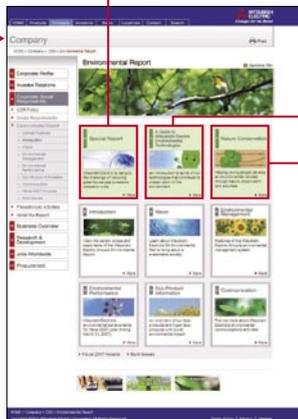
<http://Global.MitsubishiElectric.com/company/csr/index.html>

The Mitsubishi Electric Group has published the Environmental Sustainability Report 2007 on its website. This report showcases our corporate social responsibility (CSR) initiatives, and our accomplishments in fiscal 2007, and presents a special feature on our initiatives in confronting global warming. This is just one way we have taken advantage of the capabilities of the Internet to post content, including video.



## Feature: Taking on the Challenge of Global Warming

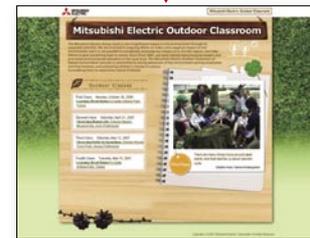
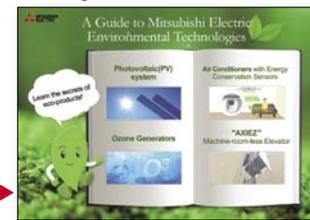
This feature describes our various initiatives and targets for reducing greenhouse gas emissions.



The Mitsubishi Electric Group's environmental protection initiatives and results for fiscal 2007 are available, including environmental information as it pertains to the corporate vision, management, performance and products.

## Guide to Mitsubishi Electric Environmental Technologies

In an easy-to-understand format, this section showcases the advantages of our appliance and industrial hardware technologies that contribute to environmental protection.



## Mitsubishi Electric Outdoor Classroom

This section presents our records of how observations of nature are making children in these classes more environmentally aware, as well as the unique activities that plant the seed of interest in science.



 **MITSUBISHI ELECTRIC CORPORATION**  
<http://Global.MitsubishiElectric.com>

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