Corporate Mission & Guiding Principles

Pioneer new markets by promoting research and development, and fostering technological innovation.

Respect nature, and aim to protect and improve the global environment.

Honor high ethical standards in all endeavors.

As a global player, contribute to the development of communities.

Technological Development

Standards in all endeavors.

Honor high ethical standards in all endeavors.

As a global player, contribute to the development of communities.

Corporate Mission

The Mitsubishi Electric Group will continue to develop its technologies and services by applying creativity to all aspects of our business. By doing so, we enhance the quality of life in our society. To this end, all members of the Group will pursue the following Seven Guiding Principles.

1. Corporate Mission
2. Respect nature, and aim to protect and improve the global environment.
3. Honor high ethical standards in all endeavors.
4. As a global player, contribute to the development of communities.
5. Establish relationships with all stakeholders based on strong mutual trust and respect.
6. Provide the best products and services with unsurpassed quality.
7. Ensure fair earnings to build reputation.

Corporate Mission

To ensure fair earnings to build reputation.

Honor high ethical standards in all endeavors.

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Through our diverse business activities and products—from appliances in the home to satellites in space—we work hard to respond to the needs and expectations of our stakeholders.

Since the day of our founding, we have conducted business with an awareness of our corporate social responsibility. Since the day this company was formed it has conducted business with an awareness of its contribution to society. Today we have made our Corporate Mission and Seven Guiding Principles the basis of corporate social responsibility for the entire Mitsubishi Electric Group. The original starting point is the “Keiei no Youtei” (Keys to Management) written at the time of the company’s founding in 1921. Among other things, it mentioned “contribute to society,” “improve product quality,” and “customer satisfaction.” Still upholding these values, our current mission and principles call for each Group employee to strive to fulfill our Corporate Mission of “improving Mitsubishi Electric’s technology and services by applying creativity to all aspects of our business,” and “to enhance the quality of life,” as well as act on the basis of the Seven Guiding Principles (Trust, Quality, Technology, Citizenship, Ethics, Environment, and Growth).

A Commitment to Action Based on Our Basic CSR Policy. Corporate social responsibility covers a very broad range of activities, and Mitsubishi Electric is actively carrying out a variety of initiatives under our Basic CSR Policy. Our response to the Kyoto Protocol, which entered into force in February 2005, is one example of our recent efforts in the environmental area. Mitsubishi Electric has been taking a variety of actions to address climate change for some time. To fulfill our responsibility as a corporation with many production facilities, we set a voluntary target of reducing emissions intensity based on net sales by 25% in 2010 compared to 1990. We are implementing a concrete action plan including introduction of energy-efficient equipment, and working to strengthen it further. In response to the European Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (the RoHS Directive), we declared that we would eliminate six chemical substances to be regulated by the end of 2005, and are moving ahead to replace them.

In terms of regulatory compliance, in February this year we established our “Corporate Information Security Policies.” In order to strengthen our management of confidential corporate information, including the protection of personal information. Since long ago we have been careful with the management of customer and other information, but recently we have made new efforts to strengthen our information management systems, such as by investing in equipment for entry and exit control of facilities, re-examining our information security strategies, encouraging internal audit of information control and other efforts.

Meanwhile, from the perspective of corporate citizenship, through our “Socio-Roots Fund,” a matching-gift program in which the company matches employee donations, we have contributed funds to help recovery efforts after a major earthquake in the Chuetsu region of Niigata Prefecture in 2004. The Mitsubishi Electric Group has also donated funds for recovery operations after the Sumatran earthquake and the devastating tsunami in the Indian Ocean in December 2004. Initiatives like these should be a basic part of corporate management. I believe it is important to show initiative and a steady commitment, and that we, including our overseas affiliates, act globally.

We are contributing to society in a variety of areas through our products and businesses, from the home to space.

Contributing through Products and Business

Besides such initiatives, I believe that contributing to society—by reducing the human impact on the environment using the extensive variety of Mitsubishi Electric’s technologies and products—is an important part of the mission of a general electronics manufacturer active around the world in diverse business categories. Part of this is what we call “Uni & Eco,” which we have applied in our products, starting from our home appliances. This concept is a fusion of the “universal design” concept, which is all about making products easy for anyone to use, and “ecology,” which is all about considering the global environment, energy conservation, and minimizing resource consumption.

We are using it as a basis for product evaluation in terms of the product life-cycle process—from the design stage, through use by the customer, until the product is disposed at the end of its life. The know-how we have gained from the home appliance recycling business that we pioneered in Japan is now being fruit in our design-for-recycling technology, which we call “hyper-cycle technology.”

I also believe that an important part of our mission is to contribute to society’s security and peace of mind. The MISTY encoding technology developed by Mitsubishi Electric has become an international standard for third-generation cell phones, and is already being put to use to create information security systems for Japan’s central and local governments. Our COCO-DATES “Correct Coordinates and Date Stamp (Time and Location Verification Service)” based on GPS satellites and meteorological information will be useful for “traceability” of agricultural and other products, and can contribute to food security, which is becoming public concern in recent years.

Mitsubishi Electric products are being used around the world in ways that the customer often might not notice—products like the Intelligent Power Module, which boosts the energy efficiency of hybrid vehicles, or products like our electric power steering motor, which can boost the fuel efficiency of cars by 3 to 5% compared to conventional hydraulic steering. Besides these examples, as with the remote-sensing satellite that measures the state of the Earth’s greenhouse gases from space as a tool to help prevent climate change, we will continue to make the most of our technological competencies in an extensive range of categories, and put them to the service of society.

We at the Mitsubishi Electric Group will continually strive to answer the expectations of all our stakeholders as we expand our perspective ever wider and deeper.
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Tackling the Challenge of Sustainable Development

Using New Ideas to Reduce Environmental Impacts

When Mitsubishi Electric announced the Poki Poki Motor to the world, I was involved in production technology development. The motor is based on the innovative concept of winding copper coils in high density around an open stator core and then bending it into a round shape. By modifying the manufacturing process, we were able to boost productivity (through automation) and simultaneously increase energy efficiency by over 3%, although many thought that it had been impossible to raise motor efficiency further. I realized that if the Poki Poki Motor were introduced throughout Japan, we could save the equivalent of the annual electrical consumption of 3 million homes. I was fascinated by the idea that improvements in manufacturing productivity could also be compatible with the environment and decided to get involved in product development. Today the Poki Poki Motor is being used in air conditioners, elevators, and many other applications and helping to reduce pressure on the environment.

Searching for Clues on the Front Line—The Factory

When a company conducts business, it has a constant impact on the global environment. The key issue is how to raise efficiency. It is important to search for ways to reduce environmental impacts by improving design and productivity. If product designers themselves walk around inside the factory, they will see the actual manufacturing conditions with their own eyes, and be motivated to design products that avoid the inefficient use of materials. Then it will be possible to reduce the generation of waste. If we also consider any repeated heating and cooling processes in manufacturing as a waste of energy, we will come up with many new ideas.

Breakthrough and Innovation through Technology

What Mitsubishi Electric can do as a general electrical equipment manufacturer is challenge ourselves to innovate with our products and operations, always using new ideas and the technologies we have developed through manufacturing to reduce negative environmental impacts, as we simultaneously aim for the best possible product performance. Aware of our responsibilities as a global corporation, our aim is to make excellent products and work with all our stakeholders to create a sustainable society.

Core Environmental Policy

The Mitsubishi Electric Group promotes sustainable development and is committed to protecting and restoring the global environment through technology, through all its business activities, and through the actions of its employees.

Environmental Code of Conduct

1. We assess the environmental impacts of our products and business activities, and strive to reduce these impacts by developing and introducing environmentally-sound technologies and processes.

2. We work through our business activities to help create a society with sound material cycles, by supporting efforts to better understand environmental issues, and by making use of technologies and information.

3. We establish environmental management systems at all of our business sites and operate them according to voluntary standards. We seek continuous improvement in our environmental management by conducting environmental audits and other efforts.

4. We educate, train and motivate employees to be good environmental stewards, and support and encourage activities that promote environmental protection.

5. We support communication and cooperation regarding environmental protection worldwide.
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Eco-Factory in Dalian

Dalian is a port town known as the “Pearl of the North Sea.” Located in this economic and technology development zone is Mitsubishi Electric (Dalian) Industrial Products Co., Ltd. (MDI), which manufactures items such as circuit breakers, inverters, and electrical discharge machines. Each factory is managed to operate under the same standards as plants in Japan, and at the same time, must comply with China’s steadily-developing legal requirements. President Nishida has a few things to say about policies for reducing environmental impacts. “Somebody once said that the most effective thing we could do is to avoid producing inferior products. I feel the same, and I think that it is important to make products with the best quality without wasting anything in the process. For practical purposes, companies have the tendency to deal separately with quality and the environment, but in reality these two are inseparable. So whenever we have the opportunity, we choose equipment for our facilities that are environmentally superior.”

Indeed, the inverter factory completed in 2004 contains many energy-saving strategies that make use of Mitsubishi Electric products. Besides installing Lossanay as an energy-efficient ventilation, dynamic inverter controls, and energy-efficient lighting, the factory also installed an “EcoMonitor” that makes it possible to measure the up-to-the-minute electrical power consumption at the level of each process in the factory, in order to identify losses. The factory is preparing to establish a system to use diagnostic data. In fiscal 2005, the same strategies will be applied at a plant that will make electrical discharge machines. The market need for energy-efficiency enhancement devices is great in China, which currently faces shortages of electricity. In the future, MDI may serve as a model of an energy-efficient factory.

Dalian is also facing problems with the shortage of water resources. Aware of this, MDI is working to develop water-recycling systems for the water used at the testing shop for electrical discharge machines. Behind these efforts are the dedicated efforts of the local staff and managers who are always seeking ways to improve things.

The Energy that Drives Eco-Factories

Japan-China relations are in the midst of change today. In order to overcome various issues and create a new relationship, it is important for people to get to know each other’s culture and interact with sincerity. The same can be said in the case of a corporation. Here we report, from the perspective of corporate social responsibility (CSR), on two factories Mitsubishi Electric has established in China.

Initiatives in Overseas Factories

China

Our Goal: To Be the World’s Best Company

“Goes without saying that we must comply with laws and regulations, but when it comes to environmental management, it is not enough just to try to limit emissions. This has to be a management-wide effort. In that context what I am most concerned about is, first of all, is the product good for the environment? That is, is it efficient? China has problems with an unstable power supply, so from the perspective of CSR, it is a significant thing that we are offering energy-efficient products, and manufacturing things efficiently,” says Osamu Iwabuchi, President of Mitsubishi Electric (Guangzhou) Compressor Co., Ltd. The next issue, he says, is pollution prevention and control of factory emissions. MGC has a business planning committee consisting of talented local staff, led by He Jin Hua, and they are doing activities to reduce environmental impacts at the factory. One example is the upgrading of wastewater treatment facilities by converting from chemical to biochemical treatment, resulting in better treatment efficiency. The team has many plans for the future, such as installing a water recycling system and reusing treated water, and taking steps to prevent leaks in the under-floor piping.

Iwabuchi says that one other important factor is communication. “Whoever the employee is, in order to have things go smoothly, it is important to deal openly and communicate clearly what it is I’m aiming for and how I want to do it. By communication I mean not just talking, but communicating eye to eye, heart to heart.” He also provides information regularly to all employees about the business conditions, and every Friday evening stands at the gate of the factory to express his thanks to every person. He puts his words into real action. This is how when compressor prices dropped a few years ago, despite opposition he explained the situation to employees, and as a result they were able to work together to overcome the adverse circumstances.

Standing beside decommissioned equipment. MDI’s President Naoki Nishida (left), manager of the production planning committee, expresses his gratitude to the people of the region for assistance. Behind him is Mitsubishi Electric (Guangzhou) Compressor’s newly-installed water treatment facilities.

Manager of the production management department, the site is responsible for constructing and operating the basic strategies as an expert of environmental management issues. Of ethnic Manchu origin, she also speaks Japanese.

Manager in working to install new cooling in chill tower, utilizing new cost-effective chillers. She is also hard at work giving instructions to a partner worker.

Manager of the MDI production line. The youthful energy of these young workers is inspiring.

Manager of the Guangzhou Eco-Factory. The EcoMonitor that sits on the Poki Poki Motor is also manufactured here.
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To help build a more dynamic, more prosperous society, the Mitsubishi Electric Group will constantly innovate and improve for a better future for everyone.

Our Goal: To Be the World’s Best Company

“Our goal is to build a more dynamic, more prosperous society. This is a business goal, but it is an important one. The Mitsubishi Electric Group is a company that is concerned about the environment and human rights, and we believe it is important to be a good corporate citizen.”

OSAMU IWABUCHI, President

China

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Manager of the production management department, He Jin Hua, is a pollution prevention and control expert. He has a master’s degree in environmental science.

Manager of the production management department, He Jin Hua

MGC (Mitsubishi Electric) Guangzhou Compressor Co., Ltd.

In the future, MDI may serve as a model of an energy-efficient factory
MCP
Mitsubishi Electric Consumer Products (Thailand) Co., Ltd.

"Global Standard" for Air Conditioners: Made in Thailand

"Kirigamine" is the name of a popular home air conditioner in the Japanese market made by Mitsubishi Electric. And it is Mitsubishi Electric Consumer Products in Thailand (MCP) that manufactures the models for Asia and Europe. It would be no exaggeration to say that the products made at this plant are connected with the entire world. If one includes reinfomation from consignees. Because of this there are many models being produced, but the design has been standardized to match the Japanese domestic model specifications, creating a “global standard” air conditioner that is expanding into markets globally. “If we can standardize a product, we can reduce the environmental impacts. For example, by using fewer materials, and boosting production efficiency,” says Katayuki Aoki, Manager of the Overseas Technology Group at Shin-koku Works, the parent factory. In Japan, air conditioners using inverters are common, but in other Asian countries there is still strong preference for single-speed equipment. In Europe as well, inverters are growing in popularity. Because of this, most of the basic parts are being standardized, although there are some differences, for example in the insulation material of indoor units. What kinds of changes were necessary to achieve this? “In Japan, we use a solid conductor cable that can be fixed in place just by pushing, but overseas it is more common to use stranded conductor cable which needs to be secured by screws, so we made some improvements to the basic design. Also, by using a simple snap-fitting design for the protective net on the air vent in the indoor unit, required to meet European safety regulations, we ensured that there was no obstacle to standardization. In addition, we have also been applying designs we’ve been doing in Japan to overseas models, such as including symbols to guide dismantling in order to facilitate recycling.”

Our Approach to Manufacturing Selected in a Country that Values Quality

Mitsubishi Electric is also working to develop a model combined with high-performance compressors that utilize the energy-efficient Pk/Pk Motor, which is being manufactured overseas. Countries like Thailand and those in Europe are using a ranking system as an official indicator of energy efficiency, and Mitsubishi Electric’s air conditioners rank in the top category (Class 5 in Thailand, Class A in Europe). Thailand has many affluent consumers with large homes, whereas each family member has his own living space, and they are increasingly paying attention to the performance of air conditioners. To maintain the top market share in a country like this, it is essential to offer excellent performance in energy efficiency and quietness.

In October 2005, an Eco Products Fair will be held in the capital Bangkok. The Mitsubishi Electric Group will have an exhibit there, and plans to announce various energy-efficient technologies at that time. “In the future, it will be necessary to create the foundations for manufacturing that is on par with or even better than in Japan, in terms of quality, environment, human resources, cost, production systems. As an Eco-Facility naturally we expect the best in terms of the factory’s energy efficiency, but I would also like to make this an even stronger company in Thailand by increasing the local procurement of parts and contributions to the local community,” says company president Masayasu Masuda.

MEAC
Mitsubishi Electric Automotive Czech s.r.o.

Our Goal: Business that also Considers the Environment

Mitsubishi Electric Automotive Czech (MEAC) car-related manufacturing is an example of key devices for cars in 2001. As European standards for automotive parts grew, MEAC is taking advantage of its central location between Eastern and Western Europe to provide a speedy supply system and service with attention to detail. The company obtained its ISO 14001 certification in September 2003, and continues working to ensure that its management considers the environment at the same time as boosting productivity. “The Czech Republic was originally blessed with abundant natural surroundings, but as a result of the rapid growth of the use of fossil fuels after the Second World War, it went through a history of industrial pollution. But some of our environmental standards especially in the area of air protection, are even stricter than many other countries in the European Union,” says Production Assistant Manager Dalimil Bartoš.

It was in this context, that MEAC in August 2004 installed equipment to break down the volatile organic compounds arising from the silicon coating process of engine control units. It captures the VOCs, breaks them down into harmless carbon dioxide and water and finally emits them into atmosphere. By using catalyst, this equipment can decompose about 98% of the VOCs. It was installed not just to comply with regulations, but as an act of corporate social responsibility.

MEU
Mitsubishi Electric Europe B.V.

The Importance of Communication


Hans-Jörg Hinkel of Mitsubishi Electric Europe (MEU) has been travelling all over Europe and keeping close contact with Japan as well. For Mitsubishi Electric’s compliance with the regulations, he says, “It’s important to sort out the correct information from the confusion and hedge our risks with the proper judgment. Although the European Union is one unified market, there are differences in the implementation of the directives, especially for WEEE country by country. For the Japanese to correctly understand the actual situation, I consider it very important to communicate with the key persons in Japan and in each of our branches in Europe.”

In Europe it is not uncommon for policies to be adopted when they are still lacking in details. In an effort to move quickly, and the details are settled later, after taking into consideration the actual problems that occur during implementation. In Japan, on the other hand, it is more common to conduct detailed planning right from the start. Although this approach might slow the conceptual stage, the implementation usually is quick and smooth. This fundamental difference in thinking is often the reason for confusion when addressing new policies, especially on the Japanese side, so communication becomes an important factor to instill a common understanding.
Special Report: CSR in Action!

MCP

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The Importance of Communication

Companies with business in Europe cannot avoid dealing with the WEEE Directive (European Directive on Waste Electrical and Electronic Equipment, making producers responsible for the recovery and recycling of used electrical and electronic equipment) entering into force in August 2005. They also need to comply with the Restriction Directive (European Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment—for 6 substances including lead and cadmium) entering into force in July 2006.

Hans-Joerg Hinkel of Mitsubishi Electric Europe (MEU) has been travelling all over Europe and keeping close contact with Japanese management. Mitsubishi Electric’s compliance with the regulations. He says, “It’s important to sort out the correct information from the confusion and hedge our risks with the proper judgment. Although the European Union is one unified market, there are differences in the implementation of the directives, especially for WEEE country by country. For the Japanese to correctly understand the actual situation, I consider it very important to communicate with the key persons in Japan and each of our branches in Europe.”

In Europe it is not uncommon for policies to be adopted when they are still lacking in details, in an effort to move quickly, and the details are settled later, after taking into consideration the actual problems that occur during implementation. In Japan, on the other hand, it is more common to conduct detailed planning right from the start. Although this approach might slow the conceptual stage, the implementation usually is quick and smooth. This fundamental difference in thinking is often the reason for confusion when addressing new policies, especially on the Japanese side, so communication becomes an important factor to instill a common understanding.
MEAA

Mitsubishi Electric Automotive America, Inc.

Recycling Starts with a Revolution in Awareness

Until 1999, Mitsubishi Electric Automotive America (MEAA), which manufactures automotive electrical components in the states of Ohio and Kentucky, recycled mainly scrap steel and cardboard. But one of the managers set his mind on doing more than this, and over five years succeeded in raising the overall recycling rate of the factories from 51% to 79%. This is a high figure, if one considers that the average recycling rate in U.S. companies is less than 50%. The company today is aggressively recycling scrap steel, cardboard, wood, plastic, circuit boards, paper, and absorbent materials. By selling these items as valuable resources, they were able to make a profit of $30,000 per year from this activity.

It is worth noting that they were able to decrease the amount of waste going to the landfill by 20%, even though the factory floor space increased by 26% over the five-year period. This is one good example of how thinking about the environment has also contributed on the economic level.

“It would be impossible to recycle without the employee cooperation. The toughest thing was creating an awareness revolution among employees,” says ISO Manager Scott Stephenson. “It is a lot easier to simply dispose of unnecessary items as garbage rather than to recycle them. But we got employees to realize that recycling also leads to economic profit, and I think we achieved good results by having them challenge themselves to find ways to save money through recycling.”

MEAF

Mitsubishi Electric America Foundation

A Better Life for Children with Disabilities

The Mitsubishi Electric America Foundation (MEAF) was founded in 1991 with funds from Mitsubishi Electric and its U.S. affiliates. The mission of the foundation is to help young people with disabilities to maximize their potential and participation in society. To date, the foundation has donated over $7 million to organizations around the country that assist people with disabilities.

In the belief that personal involvement has more impact than simply giving money, MEAF encourages volunteer activities by employees of Mitsubishi Electric U.S. companies—including expatriates and company executives. Each company has its own philanthropy committee, which organizes volunteer projects and fundraising events to benefit the local community.

“Over the past 14 years, we have supported children and youth with disabilities, through programs in education, career preparation, community integration, and recreation. As a result of MEAF initiatives and employee volunteer activities, I think we’ve been able to significantly improve the lives of thousands of young people with disabilities and their families,” says MEAF Executive Director Rayna Aylward.

http://www.meaf.org

Doing Whatever it Takes to Cut CO2 Emissions

On February 16, 2005, the Kyoto Protocol entered into force, seven years after it was adopted by signatory countries. This is an historic step for humanity, the start of a new effort to tackle global warming. Japan will need to take significant measures to fulfill its commitments under the Protocol. Here we ask key people at Mitsubishi Electric how the company will fulfill its own responsibilities.

Kanji Ohta, Corporate Environmental Sustainability Group, the navigator for Mitsubishi Electric’s environmental and energy strategies. Photo taken at the Kyoto International Conference Hall, before the ceremony to commemorate the Kyoto Protocol’s entry into force. (February 16, 2005)
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Cutting Greenhouse Gas Emissions: No Time to Waste!

What is the Kyoto Protocol? For Japan it is a promise it has to keep, as it bears the name of the historic Japanese city that hosted the conference that led to the Protocol’s adoption. The main point of the Protocol is the reduction of greenhouse gas (GHG) emissions. Japan has committed itself to a 6% reduction (compared to 1990 levels) during the first commitment period (2008-2012). These reductions are important, for it global warming continues to follow current trends, the Earth will become uninhabitable for humanity as islands and coastal areas are submerged, we suffer food crises due to abnormally warmer weather, and tropical diseases spread.

Despite its importance, a 6% reduction is not an easy number to achieve. Since 1990, Japan’s GHG emissions have not declined even once, and in fact they have increased by 8% today. Japan’s government has created the Action Program to Meet the Kyoto Protocol Targets and is implementing actions based on it, so as anyone would expect, GHG emissions reductions are a major topic for corporations as well. Strategies to reduce emissions of CFCs, HCFCs and HFCs are also needed. Energy efficiency strategies are a cost-effective way to reduce energy consumption. This is because if we can reduce the amount of electricity consumed, we can also reduce the amount of CO2 emitted in connection with the combustion of fossil fuels.

The Challenge: Reduce Energy Consumption by 25% (Per Unit of Sales)

What is Mitsubishi Electric doing to meet this challenge? Mitsubishi Electric is a leading manufacturer of semiconductor devices. Since the 1990s, Mitsubishi Electric has continued to develop semiconductor production uses a huge amount of energy, so if we didn’t separate out that component, we would never see if we had reduced our energy consumption even when trying to be energy efficient. Also, it would have been impossible to evaluate our actual energy conservation efforts. (See page 30.)

Aiming to reduce 46,000 Tons of CO2

He says that after removing the impacts of the semiconductor division that was divested, it became clear that the company would have to reduce its CO2 emissions by 46,000 tons per year by fiscal 2010 compared to fiscal 2002 in order to achieve the voluntary environmental targets (assumptions sales and production volumes were about the same levels as in fiscal 2003). A reduction of 46,000 tons of CO2 means about 10% of the fiscal 2002 emissions. Having worked now for five years towards the targets, Mitsubishi has taken all the easy steps, and the company still has to reduce emissions by a further 10%.

To deal with this, Mitsubishi Electric decided to use four strategies company-wide. It intends to achieve the following emissions reductions: 15,000 t-CO2 by installing highly energy efficient equipment (20,000 t-CO2 reduction), to reduce equipment promptly when it reaches service life and ensure that the new energy-efficient equipment. 2 Energy Loss Minimizing Project: (6,000 t-CO2 reduction) Measure and determine energy consumption, discover losses and make improvements. 3 Energy Conservation Systems (CES): (5,000 t-CO2 reduction) Use CES to use energy more efficiently and boost fuel efficiency. 4 Convert to alternative fuels: (4,000 t-CO2 reduction) Convert from large bunker oil burning boilers, to multiple small gas-burning boilers with controls on the number of boilers operating.

Monitoring Data from Production Line Reveals Clues

Our EM Project could actually be considered an EcoMonitor project, as the role of this product is huge. The EcoMonitor is a small box-like device that could fit into the palm of one’s hand. The device consists of a basic electrical distribution panel, for example, it is an excellent device to measure electrical consumption in minutes or seconds for such systems, and could be a piece of equipment or a production line.

"Of course, the main point of our EM Project is not only measuring, but also analyzing the data that has been collected. As a part of our team’s efforts, we looked at energy conservation in the production line for mounting devices on printed circuit boards, which consumes a huge amount of electricity. We installed an EcoMonitor, and when we took some measurements we found we couldn’t explain why the energy consumption was so high in some places," says Yuiko Kanaishim, Mitsubishi Electric’s Fukuymara Works.

"When we asked the workers at that station for the reason, we couldn’t get any answers—they said they didn’t have enough people, or that some trouble had occurred. They were quite defensive." At this point, the team leader dispelled the workers’ concerns by making it clear that the intention was not to put the blame on anyone for low energy efficiency. After that, everyone cooperated in the search for energy losses.

An Added Benefit of the EM Project: Higher Productivity

One example of boosting productivity, came from measuring the actual time-per-task of lines that had low production volume. After monitoring, we found that some tasks rated at 30 seconds actually took 40 seconds to complete. By accurately breaking down the time for each task, the team discovered reasons for losses. For example the equipment was idled when a worker could not keep up the assembly work. By conscientiously tracking work in the Production Plan and Production Line, we could understand the loss, which is an essential component for analysis of electrical consumption data, we were able to simultaneously reduce production losses.

As a result, the team reduced the energy intensity of the production of circuit boards by 41%, which led to reduction of annual electrical consumption of 70MW (29.51 t-CO2 equivalent). Kanoshima and her team were also awarded the Director’s Award of Chugoku Bureau of Economy, Trade and Industry at the FY2004 National Competition on Energy Efficiency Projects organized by the Energy Conservation Center Japan.

"Since this project has to be conducted while the factory is actually operating, it’s difficult to make progress if we’re just doing it to conserve energy. But after people realized that productivity would also increase, everyone was very willing to cooperate. Nevertheless, even if there was not a big boost in productivity, we were able to make people think about energy conservation. For example, in the case of the ruffle furnace, in the past if there was some trouble with the component mounting process, the workers would leave the furnace lit on because it takes time to reheat energy. So we turned it off. But through our project, once people realized that they could save energy by turning it off, they started to turn it off thoughtfully. Because everyone is a pro at manufacturing, they have a keen awareness about efficiency. They became more enthused about thinking how to eliminate losses."

Moving Toward the Post-Kyoto Regime

Kanoshima of Mitsubishi Electric has some thoughts for the future. “A large effort certainly needed to reduce emissions, but considering the fact that the world has to limit GHG emissions to half the 1990 level by about 2030, we don’t have the luxury of maintaining the current position.” In other words, if we don’t look at this needed paradigm shift will be to see it as a big business opportunity, and then use it to change the way things are. Developing the technologies and providing the solutions for this purpose will be essential for a manufacturer to survive, and at the same time they are a corporate duty to society.

"We were able to get people to think about energy intensity in terms of productivity," says Yuiko Kanaishima. "By introducing ‘can’t do’ indicators on the best practices chart, we showed the managers that we were able to improve procedures and make them easier for anyone to identify, reducing time losses.

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The Challenge: Reduce Energy Consumption by 25% (Per Unit of Sales)

What is Mitsubishi Electric doing to meet this challenge? Mitsubishi Electric has one of the most complete sets of goals  of any company in reducing energy consumption in its business operations. And the company’s post-2000 goals are even more aggressive. Mitsubishi Electric has set GHG emissions targets (assuming sales and production) of: (1) 8,000 t-CO2 by energy-loss minimization (EM) activities; (2) 46,000 t-CO2 by converting to alternative fuels; and (3) 4,000 t-CO2 by converting to alternative fuels.

Monitoring Data from Production Line Reveals Clues

Our EM Project could actually be considered an EcoMonitor project, as the role of this product is huge. The EcoMonitor is a small box-like device that could fit into the palm of one’s hand. It is an excellent device to measure electrical consumption in minutes or seconds for such systems, with the ability to be a piece of equipment or a production line.

“Of course, the main point of our EM Project is not only measuring, but also analyzing the data that has been collected. As a part of our team’s efforts, we looked at energy conservation in the production line for mounting devices on printed board circuit boards, which consumes a huge amount of electricity. We installed an EcoMonitor, and when we took some measurements we found we couldn’t explain why the energy consumption was so high in some places,” says Yuko Kaneshima of Mitsubishi Electric’s Fukuyama Works. “When we asked the workers at that station for the reason, we couldn’t get any answers—they said they didn’t have enough people, or that some trouble had occurred. They were quite defensive.” At this point, the team leader dispelled the workers’ concerns by making it clear that the intention was not to put the blame on anyone for low energy efficiency. After that, everyone cooperated in the search for energy losses.

![Chart: Energy Consumption Per Unit of Printed Circuit Boards (Before and After)](chart)

An Added Benefit of the EM Project: Higher Productivity

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ately breaking down the time for each task, the team discovered reasons for low productivity. For example, the equipment was idled when a worker could not keep up with the work load. By conscientiously tracking work in the Production Line and Pattern Setting, an essential component for analysis of electrical consumption data, we were able to simultaneously reduce both procedural losses.

As a result, the team reduced the energy intensity of the production circuit boards by 41%, which led to reduction of annual electrical consumption of 70MN (29.5 t-CO2 equivalent). Kaneshima and her team were also awarded the Director’s Award of Chugoku Bureau of Economic, Trade and Industry at the FY2004 National Competition on Energy Efficiency Projects organized by the Energy Conservation Center Japan. “Since this project has to be conducted while the factory is actually operating, it’s difficult to make progress if we’re just doing it to conserve energy. But after people realized that productivity would also increase, everyone was very willing to cooperate. Nevertheless, even if there was not a big boost in productivity, we were able to make people think about energy conservation. For example, in the case of the reflow furnace, in the past if there was some trouble with the compo-
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Moving Toward the Post-Kyoto Regime

Kanji Otta of Mitsubishi Electric has some thoughts on the future. “A large effort is certainly needed to reduce emissions, but considering the fact that the world has to limit GHG emissions to halve the 1990 level by 2030, we don’t have the luxury of maintaining the current practices.” In this regard, he commented that the Kyoto Protocol is a needed paradigm shift to be effective. “We must look at this needed paradigm shift will be to see it as a big business opportunity, and then use it to change the way things are. Developing the technologies and provid-
ing the solutions for this purpose will be essential for a manufacturer to survive, and at the same time they are a corporate duty to society.”
Our Goal: Good for Both—The global environment and the quality of life.

“Uni & Eco” is a new concept of Mitsubishi Electric. “Uni” stands for “universal design” and “Eco” for “ecology.” As environmental protection became a bigger issue in society, Mitsubishi Electric started promoting the idea of a good “Eco-Life” with its home appliances. What exactly is “Uni & Eco,” which claims to be “Good for the planet, Good for the people.” Here, we have a look at these concepts in the context of the refrigerator, a typical home appliance.

The Feel: “Uni” (Products Easy to Use, for Everyone.)

How does the concept of “Uni” or “universal design” differ from simply being “easy-to-use”? Sayuri Fukano, of our Industrial Design Center, has a few words to say about this. “Generally, easy-to-use refers to the ability of a user to use the product. For example, in the case of a refrigerator, this would mean having it designed to be easy to put things in and get them out—for a housewife of the average height. But “Uni” would mean designing it to be easy for anyone to use, regardless of their physical characteristics. To make this possible, you have to look at several things, for example: (1) Is it pleasing to use? (2) Is it easy to figure out how to use it? (3) How heavy is it? and (4) Does it minimize strain on the body? And (5) Does it consider safety and conveniences?” Team member Kobay Nagumo adds, “This is theMSN Electric model that best demonstrates the Uni concept. It has all the handles lined up vertically, and the doors open from the center. You can open the doors by pulling from any height, and you can close them with the slightest push. To avoid having doors stay partly open, we designed a double auto-closer. For home appliances, the goal is a simple design that includes many features. In the past, the main style of Mitsubishi Electric’s large refrigerators was drawn in the showroom of the Shizuoka Works refrigerator production department, and Shinobu Ogasawara of the Recycling Promotion Group at the Head Office. They succeeded in making all refrigerator doors open from the center. The models can be recycled if needed, in a very low energy-wasting process with no carbon dioxide emission of carbon, and a very low global warming factor.

In Use: “Eco” (Good Sense and Design for the Environment)

One big design issue was placing the compartments for each temperature zone in the middle section. But a new design involves new features for creating the production molds, so there’s no point in going ahead unless you bring this product to market before other companies. We wanted to be first in the world with the Uni-Closer, so the development phase was a race against time,” says Yoshikazu Kojima, who was in charge of design. So, what about the “Uni-Closer” feature? There are a lot of factors that contribute to the “Uni” factor—the resource conservation, improved packaging, use of alternative refrigerants, for example—but whatever you say, if you’re talking about a refrigerator, it has to have an energy-efficient design. Thanks to improved insulation materials and a new type of heat transfer, we have reduced electrical consumption significantly compared to products of 10 years ago. The next issue is how much can recycled materials be used. We cannot use recycled plastics in any section that comes into contact with food, but we use them for structural parts in the back, and for attaching the control circuit board, etc. Meanwhile, we do recover plastics of vegetable compartments of refrigerators taken back and re-use them for parts in new air conditioners.

End-of-Life: “Eco” (Hyper-Cycle Technology)

The Mitsubishi Electric Group established a recycling plant before Japan’s Home Appliance Recycling Law went into effect, and had it up and running in May 1993. Shiroo Ogasawara of the Recycling Promotion Group says, “In general, recycled-plastic contents of home appliances from the production process, being turned back into raw materials. The technologies and infrastructure for the recycling of end-of-life home appliances are not yet adequate, and we see these as urgent issues to address.” Home appliances contain a lot of metals and plastics, but besides the things that are easy to recycle, there are a lot of other things like additives and impurities, and insulation that cannot be reused without being melted down. There is a big need for technologies for the automatic separation of materials that can be recycled from products that have gone through mechanical crushing, and Mitsubishi Electric calls these “Hyper-Cycle” technologies. During fiscal 2005, Mitsubishi Electric will be investing in a newly-completed plant that can automatically separate polypropylene from mixed molded plastics. This is another step in a steady progress along the “Uni & Eco” road.
“Uni & Eco” is a concept that Mitsubishi Electric has developed to promote environmental sustainability in the context of home appliances. The goal is to create products that are energy-efficient, easy to use, and environmentally friendly. Mitsubishi Electric has established three main concepts: "Eco-Life," "Uni," and "Eco." These concepts are integrated into the design of its home appliances to ensure sustainability.

### Eco-Life
This concept focuses on minimizing environmental impact. Mitsubishi Electric uses isobutene R600a, a non-CFC refrigerant, in its models to reduce the warming coefficient. The company also takes steps to ensure that refrigerants are not released into the atmosphere, which contributes to climate change.

### Uni
The "Uni" concept emphasizes user-friendliness. Sayuri Fukano, a member of Mitsubishi Electric’s Universal Design Committee, emphasizes the importance of designing products that are easy to use for everyone, including those with disabilities. She suggests features like adding a handle to the refrigerator door to make it easier to open.

### Eco
The "Eco" concept centers on energy efficiency. Mitsubishi Electric has developed the Auto-closer feature, which automatically closes the refrigerator door if it is not fully closed. This feature helps to reduce energy consumption.

### In Use: "Eco" (Good Sense and Design for the Environment)
"Eco" focuses on energy efficiency and user-friendliness. For example, in Mitsubishi Electric’s large refrigerators, a door with center-opening doors is adopted to simplify the design. This design reduces the number of parts and makes it easier to use. The door is designed with easy-to-use handles, and the indicators are easy to read. The door minimizes strain on the body and is considered safe and convenient.

### In Use: "Uni" (Universal Design)
"Uni" focuses on universal design, ensuring that products are accessible to everyone, regardless of age, physical condition, or lifestyle. Mitsubishi Electric has set up a recycling plant to collect used products and re-use them for parts, contributing to the circular economy.

The Mitsubishi Electric Group maintains a recycling promotion group that is working to restrict the use of harmful substances in its products, develop new air conditioners, and promote the responsible use of resources. The group is committed to promoting environmental sustainability and ensuring that its products contribute to a sustainable future.
The Shift from “Waste Disposal” to “Production of Recycled Materials”

Hyper Cycle Systems Co., Ltd., in the city of Ichikawa (Chiba Prefecture) was established by Mitsubishi Electric in 1998. It was the first recycling factory in the home-appliance industry in Japan. Today, four years after the nation’s Home Appliance Recycling Law went into effect, this is a growth industry, and the company, a pioneer in its field, is going through a transformation. How do the people working at the front lines see things, and where is the management headed next? Here we visit the factory to see the current state of home appliance recycling.

7 Years of Evolution

Atsuko-Alice Uda is a talented worker already in her sixth year at this center. When she first came to this factory in November 1999, Japan’s Home Appliance Recycling Law had not yet entered into effect. Looking back on those early days, she says, “Even managers were still trying to figure things out, and the dismantling line wasn’t yet organized. We just did our best. We were even still trying to figure out what tools we needed. The only way was to learn as we went along.”

Today, Hyper Cycle Systems has 95 workers on the “dismantling line,” taking apart home appliances. At the busiest time, during the summer, there are 200 workers here. When Uda first arrived there were only 11 workers at this site. In the course of just a few years the factory has changed dramatically.

Used appliances that arrive at the center are covered in grime from years of use. Clouds of dust would rise not only from the automatic crushing process, but also from the manual dismantling line. Since early on, the company tried various approaches to keep the dust down, but they were hardly adequate.

In the past few years, however, the work environment has improved dramatically, with the installation of efficient dual-collection systems. Examples can be seen on the dismantling line for televisions at the company’s branch factory in Ichikawa. In 1999, the dismantling lines for air conditioners and refrigerators, completed in the spring of 2003, and the newest, a dismantling line for washing machines, the effect of reducing the amount of particles in the air was dramatic. In parts of the Kyoko factory, workers no longer need to wear masks. By mid-2005, the company’s largest plant—at the headquarters in Ichikawa—planned to go without masks in the main work area of each line.

The Goal: Closed-Loop Recycling

Takashi Hishi, president and CEO of Hyper Cycle Systems, has a few things to say about all this. “We had been making changes to the line since we started operating, but at a certain point we had done as much as we could. Ultimately, the only way to significantly reduce the suspended dust in the work area was to rebuild the actual work lines.”

“The basic guiding principles for this company, soon in its seventh year, are compliance, safety, and environment,” says Hishi. “What we are trying to create here is a new type of factory—factory that produces recycled materials. Since the beginning, I have aimed for the same standards as any factory that manufactures products, whether we’re talking about equipment and facilities or environment, or whatever.

He says that the business done here is not “waste treatment” but the “production of recycled materials.” Hyper Cycle Systems is working on closed-loop recycling together with Mitsubishi Electric. Information about dismantling and separation gleaned from the dismantling/recycling process is fed back to the design department, which then makes changes to designs so that they are easier to dismantle, recycling in mind, and the materials used in production are easier to recover.

The goal is closed-loop recycling.

Quality Itself is the Fruit of Efforts

Because this is “a factory that produces recycled materials,” every effort is made to ensure that it is done as efficiently as possible with any manufacturing plant. Any serious effort at recycling has to do so at an appropriate cost. The company has no intention to do business unless it can do so at a profit. If the aim is for real recycling, it’s not acceptable to have any losses. A growing number of customers agree with these ideals. More than anything else, this is giving Hyper Cycle Systems encouragement. “A basic part of envi-

ronmental management is to achieve your goals at the lowest possible environmental cost, and this means simultaneously minimizing the release of pollutants and maximizing the recovery of resources. That is the purpose of this company.”

This conviction of Hishi is what is driving the company, which continues every effort to improve its technologies and the quality of the “products” it produces. And the fruit of that effort is revealed in the numbers: improved recycled re-

source ratios.

These efforts for more sophisticated recycling and to achieve zero emissions are changing the mentality of the people involved—even everyone from the manufacturing plant to the recycling site. “Buzy garbage items that people normally consider to be disposable are really like treasures. Work I’m dismantling things and separat-

ing parts, but even after I return home I find myself doing the same thing,” laughs Uda. For her and the others at the leading edge of this industry, each one of those used home appliances can no longer be considered as waste. Hyper Cycle Systems and the people who work at the front lines are making steady pro-

gress toward a circular economy—or, in other words, a sustainable society.

The Kyoto branch factory of Hyper Cycle Systems Co., Ltd., started operations in February 2004. The plant uses multiple strategies to eliminate dust, among them a dual-level monitor developed by the Production Technology Research Center of Mitsubishi Electric, and dual re-

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This conviction of Hishi is what is driving the company, which continues every effort to improve its technologies and the quality of the “products” it produces. And the fruit of that effort is revealed in the numbers: improved recycled resource ratios.

These efforts for more sophisticated recycling and to achieve zero emissions are changing the mentality of the people involved—everyone from the manufacturing plant to the recycling site.” Bulky garbage items that people normally consider to be disposable are really treasure—is something I work on. It is the purpose of this company. Every effort to improve its technologies and the quality of the “products” it produces. And the fruit of that effort is revealed in the numbers: improved recycled resource ratios.

Table: Home Appliance Recycling (FY2004)

<table>
<thead>
<tr>
<th>Product</th>
<th>FY2003</th>
<th>FY2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerators</td>
<td>235,000</td>
<td>283,000</td>
</tr>
<tr>
<td>Air conditioners</td>
<td>236,000</td>
<td>334,000</td>
</tr>
<tr>
<td>Washing machines</td>
<td>205,000</td>
<td>246,000</td>
</tr>
<tr>
<td>Notebooks</td>
<td>10,094</td>
<td>12,378</td>
</tr>
<tr>
<td>Desktops</td>
<td>8,458</td>
<td>12,378</td>
</tr>
<tr>
<td>Printers</td>
<td>5,384</td>
<td>8,458</td>
</tr>
<tr>
<td>Televisions</td>
<td>7,486</td>
<td>12,378</td>
</tr>
<tr>
<td>Freezers</td>
<td>6,456</td>
<td>12,378</td>
</tr>
<tr>
<td>Display</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>PCs</td>
<td>57</td>
<td>66</td>
</tr>
<tr>
<td>LCD equipment</td>
<td>80</td>
<td>100</td>
</tr>
</tbody>
</table>

Note: The Kyoto branch factory of Hyper Cycle Systems Co., Ltd. started operations in February 2003. The plant uses multiple strategies to achieve dust reduction from the collection systems. Dust sensor checks dust levels in the work area. The Kyoto branch factory uses a dual-level monitor developed by the Production Technology Center of Mitsubishi Electric, and dust removal equipment.
4th Environmental Plan: Progress Report

The 4th Environmental Plan contains targets to be achieved over three years starting fiscal 2003. Fiscal 2004 is thus the middle year of the Environmental Plan. Here we report on our achievements to date.

Eco-Factories Initiatives at the Manufacturing Level

<table>
<thead>
<tr>
<th>Target for FY2005</th>
<th>Achievements to End of FY2004</th>
<th>Evaluation</th>
<th>See Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Promote &quot;zero emissions&quot;</td>
<td>Promote the &quot;zero emissions&quot; in the factory</td>
<td>Almost there</td>
<td>P31</td>
</tr>
<tr>
<td>● Control final disposal volume to below 1% of total waste emissions.</td>
<td>Final disposal has decreased from 0.75% to 0.37% of total waste emissions.</td>
<td>Almost there</td>
<td>P31</td>
</tr>
<tr>
<td>● Reduce volume of waste generated</td>
<td>Reduce total volume per net sales by 6% from FY2002.</td>
<td>Almost there</td>
<td>P31</td>
</tr>
<tr>
<td>堡垒 (Eco-logistics) Initiatives at the Transport/Logistics Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target for FY2005</td>
<td>Achievements to End of FY2004</td>
<td>Evaluation</td>
<td>See Page</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------</td>
<td>------------</td>
<td>----------</td>
</tr>
<tr>
<td>● Reduce CO₂ emissions</td>
<td>CO₂ emissions were reduced by 15% from FY2002.</td>
<td>Almost there</td>
<td>P34</td>
</tr>
<tr>
<td>● Reduce use of wood in packaging of major products.</td>
<td>Usage volume was 11,300 t, a 30% decrease from FY2001.</td>
<td>Almost there</td>
<td>P34</td>
</tr>
<tr>
<td>● Reduce the volume of packaging materials used.</td>
<td>Packaging material volume was 48,000 t, a 2% decrease from FY2001.</td>
<td>Almost there</td>
<td>P34</td>
</tr>
</tbody>
</table>

Eco-Products Initiatives at the Procurement/Product Use/Recycling Level

<table>
<thead>
<tr>
<th>Target for FY2005</th>
<th>Achievements to End of FY2004</th>
<th>Evaluation</th>
<th>See Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Continue promoting green procurement in partnership with suppliers.</td>
<td>Continue promoting green procurement in partnership with suppliers.</td>
<td>Almost there</td>
<td>P24</td>
</tr>
<tr>
<td>● Raise ratio of Eco-Products to at least 70% of production value.</td>
<td>Raise ratio of Eco-Products to at least 70% of production value.</td>
<td>Almost there</td>
<td>P25–27, P30</td>
</tr>
<tr>
<td>● Create advanced environmentally efficient products (Hyper Eco-Products).</td>
<td>Create advanced environmentally efficient products (Hyper Eco-Products).</td>
<td>Almost there</td>
<td>P25–27, P30</td>
</tr>
<tr>
<td>● Continue promoting the 3R’s (reduce, reuse, recycle) for products (for all aspects, including product packaging).</td>
<td>Continue promoting the 3R’s (reduce, reuse, recycle) for products (for all aspects, including product packaging).</td>
<td>Almost there</td>
<td>P16–19, P26, 34</td>
</tr>
<tr>
<td>● Improve energy efficiency of products.</td>
<td>Improve energy efficiency of products.</td>
<td>Almost there</td>
<td>P29</td>
</tr>
<tr>
<td>● Create recycling systems that comply with the European WEEE Directive.</td>
<td>Create recycling systems that comply with the European WEEE Directive.</td>
<td>Almost there</td>
<td>P11, P18–19</td>
</tr>
<tr>
<td>● Eliminate the use in Mitsubishi Electric products of six substances suspected of being environmental hazards (lead, mercury, cadmium, hexavalent chromium, two types of regulated brominated fire retardants[6]) by December 31, 2005.</td>
<td>Eliminate the use in Mitsubishi Electric products of six substances suspected of being environmental hazards (lead, mercury, cadmium, hexavalent chromium, two types of regulated brominated fire retardants[6]) by December 31, 2005.</td>
<td>Almost there</td>
<td>P24</td>
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Management, Environmental Business, Communications Other initiatives

<table>
<thead>
<tr>
<th>Target for FY2005</th>
<th>Achievements to End of FY2004</th>
<th>Evaluation</th>
<th>See Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Strengthen the basis for globally-integrated environmental management.</td>
<td>Strengthen the basis for globally-integrated environmental management.</td>
<td>Well done</td>
<td>P22–23</td>
</tr>
<tr>
<td>● Promote environmental awareness and enhance capabilities.</td>
<td>Promote environmental awareness and enhance capabilities.</td>
<td>Almost there</td>
<td>P35</td>
</tr>
<tr>
<td>● Contribute through environmental business activities.</td>
<td>Contribute through environmental business activities.</td>
<td>Almost there</td>
<td>P13–17, P30</td>
</tr>
<tr>
<td>● Communications with stakeholders</td>
<td>Communications with stakeholders</td>
<td>Almost there</td>
<td>P35</td>
</tr>
</tbody>
</table>

Note:
[1] Mitsubishi Electric only
[3] Hydrofluorocarbons
[4] Hydrofluorocarbons
[5] Hydrofluorocarbons
[6] This annual business cycle is for air-conditioner industry-wide in October. The FY2001 season was from October 2000 through September 2001.
The 4th Environmental Plan contains targets to be achieved over three years starting fiscal 2003. Fiscal 2004 is thus the middle year of the Environmental Plan. Here we report on our achievements to date.

### Eco-Factories Initiatives at the Manufacturing Level

#### Target for FY2005

- Promote “zero emissions”
- Control final disposal volume to below 1% of total waste emissions.
- Reduce total volume per net sales by 6% from FY2002.
- Reduce CO₂ emissions (carbon-equivalent energy consumption per net sales).
- Reduce total emissions by more than 18% from FY2002.
- Close down information on production facilities.
- Reduce emissions of ozone-depleting substances and greenhouse gases.
- Limit atmospheric emissions from factories to maximum 0.2% of total volume handled on-site.
- Reduced total emissions by 1.0% from FY2003, 18.8% from FY2002.
- Total HCFC and HFC emissions were 0.2% of amount handled. Target achieved.
- Total 3F’s emissions down 43.7% from FY2003. Percentage compared to purchase volume decreased from FY2002 to 10.9%, but 3% target not achieved.

#### Target for FY2004

- Achievements to End of FY2004 Evaluation See Page
  - Promote “zero emissions” three years in a row.
  - Final disposal has decreased from 0.75% to 0.37% of total waste volume. [a]
  - Wholesome companies in Japan are at 4.2%.
  - Total waste generation up 9.8% from FY2003, up 8% per net sales. Further improvement needed. [a]

#### Effectiveness Evaluation

- Wholesome companies in Japan are at 4.2%.
- Improve by over 1.5% per year. Affiliated companies in Japan: Improve by over 1.0% per year.

#### Energy conservation

- Carbon-equivalent emissions intensity was down 36% from FY1990, but 2 percentage points higher than in FY2002.
- Non-voluntary standards have been set by deducing the impacts of changes in the Electronic Devices Business Unit. Efforts are now under way implementing four strategies to achieve emissions reductions targets.

### Eco-Logistics Initiatives at the Transport/Logistics Level

#### Target for FY2005

- Reduce CO₂ emissions
  - Reduce by 20% from FY2002.
  - Distribution sector emissions were 98,000 tCO₂, same level as in FY2002.
- Eliminate use of wood in packaging of major products.
- Reduce the volume of packaging materials used.
  - Reduce by 10% from FY2001.

#### Target for FY2004

- Achievements to End of FY2004 Evaluation See Page
  - Distribution sector emissions were 98,000 tCO₂, same level as in FY2002.
  - Usage volume was 11,300 t, a 30% decrease from FY2001.
  - Packaging material volume was 46,000 t, a 2% decrease from FY2001.

### Management, Environmental Business, Communications

#### Target for FY2005

- Achievements to End of FY2004 Evaluation See Page
  - Promote environmental awareness and enhance capabilities.
  - We published the in house “Eco News” regularly, in an effort to raise environmental awareness of all employees.
  - We created education programs for each field of work (engineering, administration, sales, management, overseas employees).
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#### Other initiatives

- Strengthen the basis for globally-integrated environmental management.
  - We held regular meetings of environmental committees in every company region (Europe, Americas, Asia, China).
  - To train successors of current plant heads in key positions, we conducted “next-generation environmental key-person training,” and graduated 20 people in the first term of training.
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### Eco-Products Initiatives at the Procurement/Product Use/Recycling Level

#### Target for FY2005

- Achievements to End of FY2004 Evaluation See Page
  - Continue promoting green procurement in partnership with suppliers.
  - Among the 156 product groups ranging from mass-produced home appliances to energy efficient systems, items in 33 product groups (production value was ¥365.5 billion yen) fall within the scope of the targeted products. Among these product groups, about 85% were accomplished as Eco-Products. [b]
  - Create advanced environmentally efficient products (Hyco-Eco-Products).
  - Created a total of 33 Hyper Eco-Products in a wide range of business areas, including energy and environmental systems, industrial automation systems, information and communication systems, and home appliances.
  - Continue promoting the 3Rs (reduce, recycle, reuse) for products (for all aspects, including product packaging).
  - Currently promoting “close-loop recycling” by using recycled plastic (recycled from used home appliances in new home appliances. For example, we are already recycling cross-flow fans from air conditioners into the same parts, and have developed technologies to use washing machines from decommissioned parts in new washing machines. Such applications will be expanded in the future. [c]
  - Improve energy efficiency of products.
  - Currently targeting home appliance product category for which energy-efficient designs of each unit will affect the energy efficiency of society overall. For air conditioners, a new energy-saving model is expected to be available by the equivalent of 1,250 kWh per year compared to 10 years ago.
  - Eliminate the use of HCFCs [d] as a foaming agent by the end of FY2010, eliminate the use of HCFCs as a refrigerant by the end of FY2010.
  - Continuing the switch from HCFC refrigerants to HFCs for major models (efforts started in the FY2002 season). For refrigerators for the Japanese market, before the end of FY2004 we completed the conversion from HCFCs to substitutes (CFC-free) refrigerants.
  - Create recycling systems that comply with the European WEEE Directive.
  - We are in the process of creating a system to comply with the WEEE Directive at optimal cost, making use of our experience with home appliance recycling in Japan.
  - Eliminate the use in Mitsubishi Electric products of six substances suspected of being environmental hazards (lead, mercury, cadmium, hexavalent chromium, two types of regulated brominated fire retardants) [e] by December 31, 2005.
  - We are taking steps to eliminate the related substances from our products before the deadline, and also taking preventive actions to deal with guarantees and quality concerns. [f]

#### Management, Environmental Business, Communications

- We held regular meetings of environmental committees in every company region (Europe, Americas, Asia, China).
  - To train successors of current plant heads in key positions, we conducted “next-generation environmental key-person training,” and graduated 20 people in the first term of training.
  - Strengthen the basis for globally-integrated environmental management.
  - We held regular meetings of environmental committees in every company region (Europe, Americas, Asia, China).
  - To train successors of current plant heads in key positions, we conducted “next-generation environmental key-person training,” and graduated 20 people in the first term of training.

#### Other initiatives

- Strengthen the basis for globally-integrated environmental management.
  - We held regular meetings of environmental committees in every company region (Europe, Americas, Asia, China).
  - To train successors of current plant heads in key positions, we conducted “next-generation environmental key-person training,” and graduated 20 people in the first term of training.
  - Strengthen the basis for globally-integrated environmental management.
  - We held regular meetings of environmental committees in every company region (Europe, Americas, Asia, China).
  - To train successors of current plant heads in key positions, we conducted “next-generation environmental key-person training,” and graduated 20 people in the first term of training.
Institutional Arrangements to Achieve Objectives

We are strengthening the infrastructure for Mitsubishi Electric’s environmental management in Japan and overseas—human resources, management functions, and group-wide communication.

Three Challenges to Achieve Targets

As Mitsubishi Electric sees its contributions on environmental concerns as a management issue, it is implementing a Medium-Term Plan that incorporates both the environment and management. The 4th Environmental Plan, which started in April 2003, includes four objectives (improve eco-efficiency, enhance risk management, integrate environmental aspects into corporate management, and contribute to business performance and brand value). It also identifies three core challenges that are critical for achievement of the objectives:

1. Strengthen the global foundations for environmental management of the Group.
2. Use environmental best practices to fully incorporate environmental consideration into production facilities, products, and logistics.
3. Promote stakeholder involvement and create new environmental-related businesses.

In order successfully tackle these three basic challenges, we are undertaking various initiatives until the end of the target fiscal year of 2005, such as creating Regional Environmental Committees in five regions. The objectives of these committees are to develop a common understanding of the Mitsubishi Electric Group’s environmental policies; to improve the level of environmental management (i.e., compliance, institutional arrangements, operations); and to promote communication.

Strengthening the Global Foundations for Environmental Management

In order to strengthen the foundations for environmental management at a global level, in fiscal 2004 the Mitsubishi Electric Group started Regional Environmental Committees in five regions. The objectives of these committees are to develop a common understanding of the Mitsubishi Electric Group’s environmental policies; to improve the level of environmental management (i.e., compliance, institutional arrangements, operations); and to promote communication.

During fiscal 2004, we held these meetings in Europe (Czech Republic, September), Asia (Thailand, October, China (Shanghai, November) and the Americas (United States, March, 2005).

Ongoing Efforts to Reduce Environmental Risk

We are continuing activities such as early identification of risks through environmental assessments, as well as installation of fail-safe equipment, etc. We are making efforts to assess, verify and rectify (if problems are found) regulatory compliance and environmental performance, through rigorous auditing by auditors.

Preventing Pollution Incidents, Conducting Clean-Ups

Dealing with Soil and Groundwater Contamination

Between 1998 and 2000, voluntary groundwater studies and environmental assessments based on company regulations identified soil or groundwater contamination on 12 Mitsubishi Electric Group sites. We are conducting clean-up operations in compliance with guidance from the relevant local authorities, in areas where any contamination was confirmed.

Subsequently, contamination was discovered at two more locations—one on the grounds of an affiliate company in Tokyo where contamination was discovered during a study relating to constructing on the property, and the other at an affiliate in Gunma Prefecture where contamination was discovered in a study at a former factory site. We notified each local authority, held explanatory meetings locally, and clean-up measures are now being taken. We will continue to conduct environmental assessments, and if contamination is discovered, will promptly notify the local authorities and take the appropriate measures, including clean-up operations.

Measures to Prevent Discharge of Pollutants

In fiscal 2004, there were seven incidents involving the discharge of pollutants at Mitsubishi Electric production facilities (one case of discharge exceeding BOD limits, two cases of wastewater exceeding acidity limits, two cases of leakage of surfactants, and two cases of poor treatment of the wastewater treatment plants). In two of these incidents the discharge exceeded thresholds that require notification to the authorities (the BOD index, and one of acidity incidents). For all of these incidents, including those that did not cross the notification thresholds, we reported to the local authorities. We also took steps to recover the discharged substances, and monitored for trouble, etc. In all facilities concerned, we conducted emergency inspections to prevent leaks, took corrective actions, and took steps to prevent any recurrence. We will strengthen routine inspections and make an effort to prevent future incidents.

Independent Auditing System by the Corporate Environmental Sustainability Group

The Mitsubishi Electric Group is using three levels of auditing to promote environmental management. The first is compliance audits of our environmental management systems, done by ISO 14001 certification bodies. The second is independent internal audits by factories and affiliate companies to verify regulatory compliance and ISO compliance. The third is environmental audits conducted by Mitsubishi Electric’s Corporate Environmental Sustainability Group, targeting production facilities in 24 regions in Japan, as well as at Japanese affiliates. The latter are conducted once every two years at our own production facilities, and annually at affiliate companies.

The criteria for these audits include the relevant governmental regulations and our own 4th Environment Plan. We inspect for regulatory compliance, identify environmental risks, identify and verify environmental performance, and also conduct checks and rectify problems by going through the PDCA cycle. The person in the position of the Executive Officer reports the results of the audits to the company president.

Expertise and Communication are the Keys

The public has a high level of concern about environmental accidents and legal violations by corporations, and any incident that occurs could have major implications for a company’s future. Our group’s mission is to report the up-to-date situation on environmental management to the corporate management, in order to prevent accidents. Ultimately, I prefer it when I can report that the audits have found no problems. We are proud to have a group of auditors who are very competent and pay good attention to detail. In the course of auditing processes, we often get calls from our affiliate companies expressing concerns or seeking advice. Our work is to deal with issues so that both the auditors and the audited parties end up satisfied with the process. If they can’t count on us there’s no point in being here. We’re happy if people feel they can contact us about any matter, big or small.
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1. Strengthen the global foundations for environmental management of the Group.
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In order successfully tackle these three basic challenges, we are undertaking various initiatives until the end of the target fiscal year of 2005, such as creating Regional Environmental Committees in each of our corporate businesses.

**Two Layers of Environmental Management**

Based on the measures needed to address the basic challenges and achieve objectives set by the Corporate Environmental Managers Meeting, each Business Group develops an implementation plan and has the responsibility to carry it out.

The environmental management of the Mitsubishi Electric Group consists of two layers: the management of the overall Group, and the management of production facilities (including affiliated companies). These two layers (like inner and outer rings of a circle) promote the environmental activities of the entire Group. Each has its own management cycle but stays linked with the other, as it goes through its own PDCA (plan, do, check, act) cycle.

**Strengthening the Global Foundations for Environmental Management**

In order to strengthen the foundations for environmental management at a global level, in fiscal 2004 the Mitsubishi Electric Group started Regional Environmental Committees in five regions. The objectives of these committees are to develop a common understanding of the Mitsubishi Electric Group’s environmental policies; to improve the level of environmental management (i.e., compliance, institutional arrangements, operations) through mutual examination of activities; and to promote communication.

During fiscal 2004, we held these meetings in Europe (Czech Republic, September), Asia (Thailand, October), China (Shanghai, November), and the Americas (United States, March, 2005).

**Ongoing Efforts to Reduce Environmental Risk**

We are continuing activities such as early identification of risks through environmental assessments, as well as installation of fail-safe equipment, etc. We are making efforts to assess, verify and rectify (if problems are found) regulatory compliance and environmental performance, through rigorous auditing by auditors.

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**Three Types of Audits to Support Environmental Management**

- **Environmental Management Cycle**
  - Draft new Implementation Plan based on these results
  - An Implementation Plan is drafted by each factory based on the Mitsubishi Electric Group Environmental Plan

- **Organization Chart for Environmental Management**
  - Under each of 9 Business Groups in the Mitsubishi Electric Group, environmental management reflects the specific characteristics of the business.

- **Environmental Committee**
  - Corporate Environmental Sustainability Group
  - Environmental Technologies Committee
  - Environmental Auditing System

- **President**
  - General Manager, Corporate Environmental
  - General Manager, Group-wide environmental management

- **Environmental Audits**
  - Interal audits by factories and affiliated companies
  - Management system audits by ISO 14001 certification bodies

**Expertise and Communication are the Keys**

The public has a high level of concern about environmental accidents and legal violations by corporations, and any incident that occurs could have major implications for a company’s future. My group’s mission is to report the up-to-date situation about environmental management to the corporate management, in order to prevent accidents. Ultimately, I prefer it when I can report that the audits have found no problems. We are proud to have a group of auditors who are very competent and pay great attention to detail. In the course of auditing processes, we often get calls from our affiliate companies expressing concerns or seeking advice. Our work is to deal with issues so that both the auditors and the audited parties end up satisfied with the process. If they can’t count on us there’s no point in being here. We’re happy if they feel they can contact us about any matter, big or small.
Determining Total Environmental Costs and Benefits

We report the Mitsubishi Electric Group’s environmental accounting information to stakeholders and are actively encouraging the use of environmental accounting internally at each production facility and affiliated company.

Aggressive Investments and Their Economic Benefits for Customers

We are reporting to stakeholders the environmental accounting results of Mitsubishi Electric Corp. and Mitsubishi Electric Group, based on environmental reporting guidelines issued by Japan’s Ministry of the Environment. In fiscal 2004, the Mitsubishi Electric Group reduced environmental impacts by investing aggressively, at a level of 4.46 billion yen (an increase of 1.64 billion over the previous year). Examples of the investments include installation of equipment to support lead-free soldering processes at multiple production facilities and affiliated companies including those overseas; capital investments, particularly to improve workplace environments (for example, dust-control measures in home appliance recycling plants); and eco-logistics activities (for example, replacement of vehicles to reduce vehicle emissions). Expenditures for environmental activities amounted to 10.83 billion yen (an increase of 80 million yen over the previous fiscal year).

We generated estimated economic benefits of 113.47 billion yen in reduced electrical costs for customers, thanks to various efforts to consider energy efficiency and global warming prevention (e.g., in products such as heat-exchanging ventilation equipment (Losnay), household and commercial air conditioners, refrigerators, and energy-efficient elevator and escalators, etc.). Meanwhile, the actual economic benefits associated with environmental protection activities amounted to 3.51 billion yen.

Orientation for the Use of Environmental Accounting

After Mitsubishi Electric first introduced environmental accounting, besides the "real benefits" generated (such as the profits from the sales of valuable resources arising from recycling), starting in fiscal 2003 we added "estimated benefits," in order to evaluate the environmental benefits of products and business activities. The estimated benefits we report are the "economic benefits of environmental-conscious products/services," such as the electricity consumption saved by customers who purchase our environmentally-conscious products. At the same time, we are continuing to consider ways to determine monetary values of overall benefits of environmental protection activities, including risk-prevention effects, cost-suppression effects, and future cost-suppression effects. It is worth noting that the Mitsubishi Electric Group determines the environmental protection costs and benefits for each production facility and affiliated company, and is making use of this information for internal management purposes such as for increasing motivation for environmental protection.

http://www.mitsubishielectric.co.jp/corporate/en/ Please click on "Vision" and then "accounting standards."
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### Outline of Environmental Accounting (Mitsubishi Electric Group)

<table>
<thead>
<tr>
<th>Environment</th>
<th>Protection Costs</th>
<th>Benefits</th>
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<td>Estimated Benefits</td>
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<tr>
<td>Effective use of resources (M)</td>
<td>Economic benefits of environmentally-conscious products/services</td>
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<tr>
<td>Efficient use of energy (E)</td>
<td>Economic benefits for customers</td>
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<tr>
<td>Reduced use of substances potentially harmful to the environment (T)</td>
<td>Environmental improvement effects</td>
<td></td>
</tr>
<tr>
<td>Economic benefits of environmental protection activities</td>
<td>Risk-prevention effects</td>
<td></td>
</tr>
<tr>
<td>Earnings &amp; savings effects</td>
<td>Future cost-suppression effects</td>
<td></td>
</tr>
</tbody>
</table>

### Costs and Benefits of Environmental Protection Activities (FY1999 – 2004)

(Economic benefits here do not include estimated benefits.)

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>Environmental protection costs</th>
<th>Earnings &amp; savings effects</th>
<th>Future cost-suppression effects</th>
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<tbody>
<tr>
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<td>100 million yen</td>
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<tr>
<td>2003</td>
<td>100 million yen</td>
<td>43</td>
<td>36</td>
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</table>

### Design for the Environment Contributes to the Economy—An Example

Of the products the Mitsubishi Electric Group shipped in 2004, the market-based electrical consumption of the 93 product groups that comply with the Group’s Design for Environment criteria amounts to about 13,000 GWh per year (calculated by Mitsubishi Electric). About 90% of this is consumed by home appliance, which is characterized by a long product life and large number of units. We estimate that starting from the base year of 1994 and making use of 2004 data for the 93 product groups in this category, these products account for one-quarter of household electrical consumption in Japan.13 If we could cut 1,235 GWh per year (a possible estimate) to products of ten years ago,14 this is equivalent to the annual electrical consumption of 300,000 typical households.15 Because large benefits accrue if we can improve energy efficiency per unit in the home appliance category, we are paying special attention to improvement in design in this category, and use this as a contribution to society.
Environmental Sustainability Report 2005

Promoting Green Procurement and Reducing Environmental Impacts of Products

Mitsubishi Electric is reducing the environmental impacts of products by further improving its green procurement system—including an expanded number of categories investigated, and faster confirmation of information from suppliers.

Better Information Management on Chemical Content—Another Step Closer to Eliminating Regulated Chemicals

The European Union’s RoHS Directive on chemicals contained in products will soon enter into force. In response to concerns about soil and groundwater contamination from lead and other substances in products that contain lead, Mitsubishi Electric has developed a system to address these concerns. It is worth noting that, in contrast to the European approach of regulating the use of substances, Japan's approach (under the Waste Management Law) is to encourage proper control and treatment in order to prevent the discharge of lead and other substances at the waste disposal stage.

Mitsubishi Electric plans to completely eliminate lead and other substances targeted by the RoHS Directive before it enters into effect on December 31, 2005, and will be offering environmentally-compatible products that can be accepted even in Europe.

For these reasons, we are taking various steps, such as obtaining information about the chemical content of the parts and materials we use, obtaining declarations guaranteeing certain substances are not being used, and conducting verification through analysis (using Single-Drop Extraction Analysis Technology).

By the end of March 2005, well before the RoHS deadline, we had eliminated the use of lead and converted to lead-free solder in the circuit boards of home appliances. To ensure quality we have been sending our technical personnel around the country to hold explanation sessions with our production facilities, affiliated companies, and business partners. We have also taken steps to distinguish between lead-free and lead-containing principle parts and components by adopting unique markings that indicate “lead-free solder,” in an effort to provide information that will help ensure proper handling and resource recovery at the time of disposal or recycling.

Using RoHS and WEEE Directives

The European Union’s “Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.” Six targeted substances include lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE). Mitsubishi Electric is reducing the environmental impacts of products by further improving its green procurement system—including an expanded number of categories investigated, and faster confirmation of information from suppliers.

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Using Green Procurement to Reduce the Use of Substances Potentially Harmful to the Environment

If manufacturers are to offer customers products and services that are better for the environment, they must procure materials that have lower environmental impacts. The Mitsubishi Electric Group counts green procurement as an important element of its Environmental Plan. In September 2000, we adopted the Mitsubishi Electric Group Green Procurement Standards Guide and have been promoting environmentally-conscious procurement activities.

In order to gather the information needed to implement green procurement, we are utilizing our Green Procurement Support System. Starting in fiscal 2004, we have been entering a variety of data into the system, including data from an “Evaluation of Environmental Initiatives Including Suppliers’ Efforts” (Trading Companies, Manufacturers, etc.). By using this system, we are now evaluating our suppliers from the environmental perspective as part of our procurement activities.

In addition, we made efforts to boost the efficiency of green procurement tasks, by introducing a New Green Procurement Search System for Chemical Content in Products, which allows users to search based on various criteria for information relating to chemical contained in materials purchased for manufacturing purposes (e.g., manufacturer name, product identification numbers, chemical names, compliance with the European Union’s RoHS Directive, etc.). In an effort to enhance our green procurement, we have created a database using the above system for use within the Mitsubishi Electric Group, and users can now access information on about 20,000 items including purchasing materials and devices.

Eco-Products Overview

Eco-Products have been created in the design stage of Mitsubishi Electric’s products. Through post-market evaluation, we are also able to verify the eco-efficiency of Eco-Products. Eco-Products were first evaluated in 1991, and in fiscal 2004 certified Hyper Eco-Products in 32 product groups in a wide range of business areas—including energy and electric systems, industrial automation systems, information and communication systems, and home appliances. In the future we will aim to expand the selection of products that fulfill the Hyper Eco-Products criteria, with a focus on “Uni & Eco” products (see pages 16-17).

Creating “Hyper Eco-Products”

Mitsubishi Electric defines its “Eco-Products” as “products that offer enhanced usability and functionality and throughout the life cycle have lower environmental impacts”—in short, products with higher “eco-efficiency.” Hyper Eco-Products are products that have higher eco-efficiency than Eco-Products, and that in addition to the products’ core functions also offer environmental benefits when used.

In fiscal 2003, we established criteria for Hyper Eco-Products, and in fiscal 2004 certified Hyper Eco-Products in 32 product groups in a wide range of business areas—including energy and electric systems, industrial automation systems, information and communication systems, and home appliances. In the future we will aim to expand the selection of products that fulfill the Hyper Eco-Products criteria, with a focus on “Uni & Eco” products (see pages 16-17).

Making Eco-Products with Better Eco-Efficiency

We are creating Eco-Products that fully consider Materials, Energy, and Toxicity (MET)—the key concepts of our Core Environmental Philosophy—in the product life cycle. And we are challenging ourselves to create Hyper Eco-Products using even higher standards.
Promoting Green Procurement and Reducing Environmental Impacts of Products

Mitsubishi Electric is reducing the environmental impacts of products by further improving its green procurement system—including an expanded number of categories investigated, and faster confirmation of information from suppliers.

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In addition, we made efforts to boost the efficiency of green procurement tasks, by introducing a new Green Procurement Search System for Chemical Content in Products, which allows users to search based on various criteria for information relating to chemical contained in materials purchased for manufacturing purposes (e.g., manufacturer name, product identification numbers, chemical names, compliance with the European Union’s RoHS Directive, etc.).

In an effort to enhance our green procurement, we have created a database using the above system for use within the Mitsubishi Electric Group, and users can now access information on about 20,000 items including purchasing materials and devices.

Better Information Management on Chemical Content—Another Step Closer to Eliminating Regulated Chemicals

The European Union’s RoHS Directive on chemicals contained in products will soon enter into force, in response to concerns about soil and groundwater contamination from lead and other substances in products disposed of as waste. It is worth noting that, in contrast to the European approach of regulating the use of substances, Japan’s approach (under the Waste Management Law) is to encourage proper control and treatment in order to prevent the discharge of lead and other substances at the waste disposal stage.

Mitsubishi Electric plans to completely eliminate lead and other substances targeted by the RoHS Directive before it enters into effect on December 31, 2005, and will be offering environmentally-compatible products that can be accepted even in Europe.

For these reasons, we are taking various steps, such as obtaining information about the chemical content of the parts and materials we use, obtaining declarations guaranteeing certain substances are not being used, and conducting verification through analysis (using Single-Drop Extraction Analysis Technology).

By the end of March 2005, well before the RoHS deadline, we had eliminated the use of lead and converted to lead-free solder in the circuit boards of home appliances. To ensure quality we have been sending our technical personnel around the country to hold explanation sessions with our production facilities, affiliated companies, and business partners. We have also taken steps to distinguish between leaded and lead-free printed circuit boards and components by adopting unique markings that indicate “lead-free solder,” in an effort to provide information that will help ensure proper handling and resource recovery at the time of disposal or recycling.

Determining Chemical Content with the Single-Drop Extraction Analysis Method

By using this rapid-analysis technology developed by Mitsubishi Electric, it is now possible to detect substances such as hexavalent chromium and brominated flame retardants much more quickly than was previously possible. We developed the method in 2003, starting using it in 2004, and are now analyzing content information and testing the validity of alternative substances.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Standard Method</th>
<th>Conventional Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexavalent chromium</td>
<td>30 to 60 minutes (50 hours)</td>
<td>15 hours</td>
</tr>
<tr>
<td>Brominated flame retardants</td>
<td>30 to 60 minutes</td>
<td>50 hours</td>
</tr>
</tbody>
</table>

The new method is 600 times faster than the former method involving single-drop extraction, and 1000 times for PBB and PBDE.

Lead-free solder” markings for components and printed circuit boards, Mitsubishi Electric standards

Eco-Products Created from the MET Approach

Mitsubishi Electric has been using Design for the Environment since 1991. We verify the compliance with Design for Environment criteria using “3R Product Assessments” (“3R” for Reduce, Reuse, Reincorporate) consisting of 14 major and 51 intermediate evaluation categories determined from the MET approach, and evaluate them subsequently using Life-Cycle Assessments (LCA) (see page 28) and Factor X (see page 29).

After completing company procedures, we certify as “Eco-Products” those products that we determine through this process to be environmentally efficient and environmentally effective.

In our 4th Environmental Plan we set a target of having Eco-Products account for at least 70% of our production volume by the end of fiscal 2005. In fiscal 2004 we achieved a ratio of 80% of Eco-Products in the 93 applicable product groups.

Making Products with Better Eco-Efficiency

We are creating Eco-Products that fully consider Materials, Energy, and Toxicity (MET)—the key concepts of our Core Environmental Philosophy—in the product life cycle. And we are challenging ourselves to create Hyper Eco-Products using even higher standards.

Eco-Products Share of Mitsubishi Electric’s Total Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Eco-Products Share</th>
<th>Eco-Products’ share of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>29.4 (10,145)</td>
<td>74.2</td>
</tr>
<tr>
<td>2003</td>
<td>35.0 (15,827)</td>
<td>70.1</td>
</tr>
<tr>
<td>2004</td>
<td>49.7 (25,038)</td>
<td>60.0</td>
</tr>
<tr>
<td>2005</td>
<td>60.0 (49,019)</td>
<td>58.1</td>
</tr>
</tbody>
</table>

Introduction of a new concept or innovative technology that contributes to sustainability.

Achieve a factor rating higher than 2. (Our “Factor X” allows simultaneous assessment of Environmental/Energy/Toxicity and product performance).

Achieve a prestige environmental-related award of excellence.
Evaluation and Design Methods for Life-Cycle Thinking

Mitsubishi Electric is promoting Design for Environment by paying attention to the effects of product improvements over the entire product life cycle—using methods such as life cycle assessments (LCA) and designs that optimize total costs, etc.

LCA Methods Support Design for Environment

Life-cycle assessments are a methodology to quantitatively and comprehensively evaluate the environmental impacts of a product through its entire life cycle—including resource extraction, design, manufacturing, transport, use, and disposal. This methodology is essential for the design of Eco-Products. The LCA approach is one of the initiatives we are implementing to evaluate items for product assessments in the 4th Environmental Plan of the Mitsubishi Electric Group. In order to steadily promote Design for Environment and support the designers, we have standardized the implementation steps for LCA. A special feature is that we implemented LCA using our own database that integrates key data on devices manufactured by Mitsubishi Electric with data relating to recycling and processing accumulated by Hyper Cycle Systems, Co., (see pages 18–19), and public data such as that published by the LCA Project of Japan’s Ministry of Economy, Trade and Industry (METI). We have created a database of 796 items in total, and are currently making use of it group-wide by intranet.

Building a Reliable Database, Providing Information

The key to life-cycle assessments is the robustness and accuracy of the database, which is the basis for assessments. In 1999 when I first got involved in the issue, there was little information in Japan that we could use, so the key issue was to improve the situation. We collected data from all types of literature. And then, we added accountings from factories on Mitsubishi Electric semiconductors and other products, which are key devices in industry. Thanks to improvements in both data quality and volume in the database, the LCA approach has spread to all of our production facilities. LCA is becoming increasingly important during the development and design phase of a product, just as performance and quality have always been important. We will continue our efforts to release highly reliable assessment results.

An LCA Example: The Intelligent Power Module

A life-cycle assessment clearly reveals changes in environmental impact. In the Intelligent Power Module, a semiconductor that contributes to energy management in vehicles, the environmental impacts were all reduced, by reducing size and eliminating the heat coil.

Design Methods to Optimize Total Cost

In order to promote product recycling, it is important to know the dismantling costs—the same way it is important to know the costs at the time of manufacture. If a product is built too sturdily it will take longer to dismantle, and it is painted too elaborately, it might be more difficult to recycle and end up as garbage. A design that someone thought was attractive may actually become a hindrance when it comes time for recycling. Being easy to make, and also easy to dismantle are important criteria for Design for Environment.

With this in mind, we have developed unique tools to support product design with consideration given to easy dismantling and recycling. Representing data accumulated by Hyper Cycle Systems, Co., these tools create graphs visually by computer simulation of the total cost (including profits from sale of recovered valuable materials, disposal costs for waste and personal costs) and dismantling time. This visual approach enables us to discover problem points, promote trade-offs, and optimize the total costs.

Calculation of Total Cost at Recycling Time

![Graph showing total cost and dismantling time at recycling time](Image)

- **Total cost during recycling**: Total cost (the sum of the costs of materials recovered and materials to be recycled) at the time of recycling.
- **Dismantling time per part**: Time taken to dismantle a part of the product.
- **Dismantling completion point**: Dismantling completion point (the point where the product can be dismantled completely).
- **Total cost during recycling**: Total cost (the sum of the costs of materials recovered and materials to be recycled) at the time of recycling.

- **Total time to dismantle**

  Calculation:

\[
\text{Total time to dismantle} = \sum_{i=1}^{n} (\text{Dismantling time per part}_i \times \text{Quantity}_i)
\]

= Total cost during recycling / (Profit per part + Disposal cost per part + Personal cost per part)

= Total dismantling time / Total number of parts

= Total cost during recycling / (Profit per part + Disposal cost per part + Personal cost per part)

Special Indicators to Evaluate MET (Material/Energy/Toxicity) of Products

If we are to realize a sustainable society, we need new lifestyles based on products that offer higher value-added and better eco-efficiency.

In December 2001, Mitsubishi Electric was the first in its industry in Japan to apply the concept of Factor X, as an indicator of the eco-efficiency of products. The conventional approach to calculate the factor value emphasized the size of contribution of environmental impact factors, and treated improvements in product performance as a constant value (i.e., its numerator in the equation was 1). In fiscal 2004, however, we started to include improvements in product performance in the calculation. We evaluate the factor by multiplying the environmental impact factor (which compares the environmental impact index of old and new products as a vector sum of three components under MET) by a performance factor (which is the arithmetic average of performance indicators of old and new products). Since improvements in the product’s functions (i.e., performance), go into the numerator and reductions in environmental impacts go into the denominator, a product’s eco-efficiency can be raised by making the denominator smaller.

A feature of this evaluation method is that in order to dramatically increase a factor, it is necessary to have a balanced approach to improving each of the components of MET (i.e., the total value will not become much larger only by improving energy efficiency).

- **Basic Concepts to Calculate Factor Rating**

  \[\text{Factor} = \text{Degree of performance improvement (life style value)} \times \text{Degree of environmental impact reduction}^2\]

  **Factor =** Degree of performance improvement x Degree of environmental impact reduction

  \[\text{Factor} = \frac{\text{MET value of new product}}{\text{MET value of baseline product}} \times \left(\frac{\text{baseline product}}{\text{new product}}\right)^2\]

- **Example: Commercial-use ceiling concealed Lossnay**

  - **Product A**
    - MET value of new product: 1.400
    - MET value of baseline product: 2.800
    - Factor = 1.400
    - Improvement in environmental impact: 50.0%
  - **Product B**
    - MET value of new product: 1.363
    - MET value of baseline product: 2.726
    - Factor = 1.363
    - Improvement in environmental impact: 51.0%

  **Conclusions:** Factor B is superior to Factor A in terms of environmental impact.

Our Challenge to Achieve Factor 4

To help realize sustainable society, we develop and offer Eco-Products that incorporate the Factor X approach into product design.

Driving Force that Creates Eco-Products

When consumers see a product’s factor rating, they can intuitively appreciate how much a company has been working on technological development, or how far they have come in creating products for the environment in mind. Mitsubishi Electric is already providing this information, as one of the “Type 2 environmental labels” on its website. "Factor X is a future-oriented, “optimistic” index that fairly evaluates design and technologies, and functions as an incentive to designers and technical personnel. It also helps to clarify future targets to be achieved, and can be a driving force for the creation of Eco-Products.

In order to increase the value in the market of the factor evaluation methods, Mitsubishi Electric participatates in the Environmental Efficiency Forum in Japan, and works to promote further developments in and awareness about indicators. Mitsubishi Electric will continue to work towards its target of Factor X, as another step towards sustainable society.
Mitsubishi Electric is promoting Design for Environment by paying attention to the effects of product improvements over the entire product life cycle—using methods such as life cycle assessments (LCA) and designs that optimize total costs, etc.

**Approaches to Create Eco-Products**

**Building a Reliable Database, Providing Information**

The key to life-cycle assessments is the robustness and accuracy of the database, which is the basis for assessments. In 1990 when I first got involved in the field, there was little information in Japan that we could use, so the key issue was to improve the situation. We collected data from all types of literature. And then, we added accumulated data from factories on Mitsubishi Electric’s semiconductors and motors, which are key devices in industry. Thanks to improvements in both data quality and volume in the database, the LCA approach has spread to all of our production facilities. LCA is becoming increasingly important during the development and design phase of a product, just as performance and quality have always been important. We will continue our efforts to release highly reliable assessment results.

**LCA Methods Support Design for Environment**

Life-cycle assessments are a methodology to quantitatively and comprehensively evaluate the environmental impacts of a product throughout its entire life cycle—including resource extraction, design, manufacturing, transport, use, and disposal. This methodology is essential for the design of Eco-Products. The LCA approach is one of the initiatives we are implementing to evaluate items for product assessments in the 4th Environmental Plan of the Mitsubishi Electric Group. In order to steadily promote Design for Environment and support the designers, we have standardized the implementation steps for LCA. A special feature of this methodology is that we implemented LCA using our own database that integrates key data on devices manufactured by Mitsubishi Electric with data relating to recycling and processing accumulated by Hyper Cycle Systems, Co., (see pages 18–19), and public data such as that published by the LCA Project of Japan’s Ministry of Economy, Trade and Industry (METI). We have created a database of 776 items in total, and are currently making use of it Group-wide by intranet.

**Design Methods to Optimize Total Cost**

In order to promote product recycling, it is important to know the dismantling costs—such as labor and parts replacement costs. If a product is built too sturdily it will be more difficult to recycle and end up as garbage. A design that someone thought was attractive may actually become a hindrance when it comes time for recycling. Being easy to make, and also easy to dismantle are important criteria for Design for Environment.

**Our Challenge to Achieve Factor 4**

To help realize sustainable society, we develop and offer Eco-Products that incorporate the Factor X approach into product design.

**Evaluation and Design Methods for Life-Cycle Thinking**

**Special Indicators to Evaluate MET (Material/Energy/Toxicity) of Products**

If we are to realize a sustainable society, we need new lifestyles based on products that offer higher value-added and better eco-efficiency. In December 2001, Mitsubishi Electric was the first in its industry in Japan to apply the concept of Factor X, as an indicator of the eco-efficiency of products. The conventional approach to calculate the factor value emphasized the size of contribution of environmental impact factors, and treated improvements in product performance as a constant value (i.e., its numerator in the equation was 1). In fiscal 2004, however, we started to include improvements in product performance in the calculation. We evaluate the factor by multiplying the environmental impact factor (which compares the environmental impact index of old and new products as a vector sum of the three components under MET) by a performance factor (which is the arithmetic average of performance indicators of old and new products). Since improvements in the product’s functions (i.e., convenience) go into the numerator and reductions in environmental impact go into the denominator, a product’s eco-efficiency can be raised by making the denominator smaller.

A feature of this evaluation method is that in order to dramatically increase a factor value it is necessary to have a balanced approach to improving each of the components of MET (i.e., the total value will not become much larger only by improving energy efficiency).

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In order to increase the value in the market of the factor evaluation methods, Mitsubishi Electric participates in the Environmental Efficiency Forum® in Japan, and works to promote further developments in and awareness about indicators. Mitsubishi Electric will continue to work towards its target of Factor X, as another step towards sustainable society.
Environmental Sustainability Report 2005

Contributing to the Environment and Society through a Range of Business Activities

We are contributing to the environment and society through our Eco Solutions Business, which utilizes satellite and information technologies and develops Eco-Products and Hyper Eco-Products for a range of uses—from households, to infrastructure, to industry.

Hyper Eco-Products & Eco-Products

By energy efficient design, reduced energy consumption by 72% as compared to 1991 models.

Room Air Conditioner msz-24vors

- Compressor using the Piki Piki Motor increased energy efficiency by 70%.
- Efficiency of the entire product was improved by about 50%.
- High efficiency motors account for about 50% of electrical consumption in Japan. The Piki Piki Motor is being used in many products.

Screened condenser allows about 60% reduction in the amount of space required. New insulation package technology with high heat dissipation allows about 60% reduction in the amount of space required. A new connection method between the front and rear is being applied, reducing the need for labor.

High Employee Awareness Helps to Eliminate Waste

We are committed to reduce total waste emissions by strengthening the 3Rs and by creative efforts at the factory level.

Achieved: A Factory with 100% of Waste Recycled into Resources

The Fukuyma Works obtained ISO 14001 certification in 1997, and after working towards 100% recycling of resources, and starting in April 2004 has achieved its target for all waste, including general waste (i.e., industrial waste as well as office-related general waste).

There are two points worth noting in this factory’s success. The first is the direct link between the product design process and production technologies that promotes reducing, reusing, and recycling. The factory succeeded in improving the yield rate (i.e., reducing waste) by using thinner resins in products and reusing molding materials, as well as by making parts smaller and making improvements to die assemblies.

The second is awareness-raising activities, with the participation of all employees. The factory worked to suppress the generation of general waste, and at the same time conducted routine checks to ensure that waste was being properly separated into recyclable categories. A display showing the properly waste separation (bottom left photo), was a major factor in the success of raising awareness about the 3Rs.

COCO-DATES

Example: Industrial Waste Disposal

The COCO-DATES code (left of display) shows the amount of industrial waste disposed. This code can be verified by Internet whether or not the waste has been properly disposed.

In addition, this factory has introduced a system whereby employees at the Fukuyma Works set up displays and conduct the 3Rs to facilitate recycling. After separating waste to analyze and measure, we discovered that more than 40% of it consisted of resources such as paper and PET bottles. To reduce the amount of waste, we re-allocated our waste management budget to all departments, and the quantity of waste was greatly reduced.
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Hyper Eco-Products & Eco-Products

Poki Poki Motor, v2

Motors account for about 50% of electrical consumption in Japan. The Poki Poki Motor is based on a production technology that was developed in 1995 to boost both performance and manufacturing productivity. This motor is produced by a unique method developed by Mitsubishi Electric of winding the coils around the stator core and then bending it into a round shape, allowing for high-speed winding during production. The higher coil density makes these motors more compact. They are being used in many products today, from air-conditioners and other home appliances to elevators.

COCO-DATES

COCO-DATES stands for “correct coordinate and date stamp,” and is a new service that provides location and time information via smartphones and other mobile devices. COCO-DATES allows the user to capture and record photographic images and video at a specific location and time. This system combines GPS with a weather satellite to determine the location of images taken by special cameras that have been registered. The location is determined by a weather satellite that includes visual images. These applications under consideration include tracking industrial waste to ensure proper disposal, “untraceability” for food products, management of factory operations, evidence of security inspection routes, photographic evidence for newspapers, and documentation evidences.

Example: Industrial Waste Disposal

In the example of the COCO-DATES case (left of reduction-transport: lime, glass, waste material), a waste visitor can verify by Internet whether or not the waste has been properly disposed.

High Employee Awareness Helps to Eliminate Waste

We are committed to reduce total waste emissions by strengthening the 3Rs and by creative efforts at the factory level.

Zero Emissions Achieved for Past 3 Years

To create a society based on sound material cycles, the Mitsubishi Electric Group has since fiscal 2002 made a sustained effort to keep the amount of waste sent to the landfill below a certain ratio of total waste emissions (our working definition of zero emissions). Mitsubishi Electric Corporation has achieved zero emissions three years in a row. For affiliated companies, after investigating the waste management situation, we started an intensive measures at waste separation and provided information on effective use of waste materials. In fiscal 2004, the ratio of waste going to the landfill improved to 4.3%.

Total emissions of the Mitsubishi Electric Group in fiscal 2004 were 129,000 tons, an increase of 9.8% over fiscal 2003. In terms of waste per unit of sales, the ratio worsened by 8%. We will make further efforts to improve the situation, including company-wide expansion of a pay-per-waste-category system that has proven results for waste reduction in the Kobe area, as well as sharing of waste-related information in local areas.

Achieved: A Factory with 100% of Waste Recycled into Resources

The Fukuyama Works obtained ISO 14001 certification in 1997, and after working towards 100% recycling of resources, and starting in April 2004 has achieved its target for all waste, including general waste (i.e., industrial waste as well as office-related general waste). There are two points worth noting in this factory’s success. The first is the direct link between the product design process and production technologies that promote reducing, reusing, and recycling. The factory succeeded in improving the yield ratio (i.e., reducing waste) by using thinner resins in products and reusing molding materials, as well as by making parts smaller and making improvements to die assemblies.

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After separating waste to analyze and measure, we discovered that more than 40% of it consisted of resources such as paper and PET bottles. To reduce the amount of waste, we re-allocated our waste management budget to all departments, although it was previously budgeted in one “basket” in my department for the entire factory. We also introduced a system whereby each department pays for its own waste handling costs—i.e., using the same budget to cut costs, everyone was forced to think about what they could do to avoid throwing out waste. Then each department started its own efforts—for example, one created a more detailed list of categories for waste separation, one had the manager checking on garbage disposal, and another worked to avoid excess packaging—and as a result waste disposal was cut in half. I was chastised because we could not recover the budget that we had distributed to each department. But what made me the happiest was that everyone’s attitude toward waste has changed.
Environmental Sustainability Report 2005

New Targets, Four Strategies for 2010

Under our 4th Environmental Plan, we are aiming to reduce CO₂ emissions by 1.5% per year. We have also decided on tough new targets and strategies to achieve them.

Higher Voluntary Targets

Under its 4th Environmental Plan, the Mitsubishi Electric Group has established voluntary action targets to reduce CO₂ emissions from energy use during manufacturing (measured as “emissions intensity,” based on carbon-equivalent energy consumption per unit of net sales) by at least 25% by fiscal 2010 compared to fiscal 1990 levels. In order to reduce its emissions by 1.5% per year per unit of net sales, each factory is tackling emissions reductions according to a plan.

In fiscal 2004, Mitsubishi Electric Corporation’s CO₂ emissions amounted to 430,000 t-CO₂, which is an increase of 3% over fiscal 2003. Emissions increased due to the large impact of higher energy consumption for air conditioning increased due to hot weather, and for manufacturing due to favorable business conditions in the Industrial Automation Systems division. The emissions intensity was 36% lower than in fiscal 1990 (a 2 point increase compared to fiscal 2003).

CO₂ emissions and emissions intensity based on net sales were both down considerably in fiscal 2003. This is due in particular to having divested a part of our Electronic Devices Business Unit (Renesas Technology Corp.). To exclude its effects, we recalculated the fiscal 1990 base year value of emissions per net sales for our voluntary targets, by removing the equivalent of Renesas’ emissions from the actual figures for fiscal 1990. By fiscal 2010, we will reduce our CO₂ emissions by an additional 46,000 tons from fiscal 2002 levels, which is a relatively high target, in order to fulfill our corporate responsibilities (see pages 13–15).

Results of Our Four Strategies in FY2004

In order to reduce our CO₂ emissions by 46,000 tons during the seven years leading up to fiscal 2010, we launched four strategies in fiscal 2004: installing highly energy-efficient equipment, conducting energy-loss minimization (EM) activities, installing cogeneration systems (CSS), and shifting to alternative fuels (see page 14).

As shown in the graph below, during fiscal 2004 we reduced emissions by a total of 6,184 t-CO₂, and invested a total of 1.532 billion yen (including government assistance of about 15 million yen) for the four strategies.

For installation of highly energy-efficient equipment we exceeded our target of a 3,600 t-CO₂ reduction by 114%. This we accomplished by replacing air conditioners, by controlled operation by installing multiple small boilers, and by the installation of electric air conditioners, high-efficiency lighting equipment, and transformers. Regarding the EM activities, our successes have been limited to just a few factories, as the activities began in the middle of the year. As for the cogeneration strategy, the advantages of cogeneration declined after the strategy had been decided, due to a drop in electricity process, so we are now reconsidering the situation. Regarding the conversion to alternative fuels, emissions have dropped considerably thanks to our having converted boilers from heavy fuel oil to natural gas.

Controlling Chemical Substance Use and Emissions to the Environment

We are taking steps to properly control and reduce our largest category of releases—volatile organic compounds (VOCs).

Reducing VOC Emissions by Cutting Wastage, Using Alternatives, Using Removal Equipment, etc.

The Mitsubishi Electric Group has been conducting voluntary controls of chemical substances since 1997. We have entered information on the parts and materials procured into our chemical substance management system, and have prioritized which substances to reduce based on calculated substance usage and releases. We are now taking action to reduce releases, with the aim of an 18% reduction in fiscal 2005 compared to fiscal 2002.

To achieve our reduction targets, we are focusing on VOCs (toluene, xylene, styrene), the largest category of gases emitted by Mitsubishi Electric and taking a number of steps: (1) reducing wastage caused by over-purchasing, excess use, etc., (2) changing processes to reduce the frequency of use, (3) using alternative substances that are low in VOC content, and (4) introducing equipment to remove VOCs.

Releases and Transfers Down 1.0% from FY2003

In fiscal 2004 the Mitsubishi Electric Group used 5,944 tons (110 types) of chemical substances (Mitsubishi Electric Corp. used 96 types). Releases and transfers amounted to 1,033 tons, a 1% decrease from fiscal 2003. The decrease was 18% in 2003, indicating that the rate of decrease has slowed. One reason for this is that there was no major factor to cause a reduction, such as selling-off a business unit. Besides this, decreases in chemical releases and transfers from ongoing efforts—such as opting for shifting to utilizing lower-VOC coating paints and reducing the surface area of sheet metal to be coated—were not enough to offset increases due to higher production of factory automation equipment and electrical automotive equipment.

In the future, in order to steadily reduce our releases and transfers, we must introduce new strategies that will not affect productivity, and for that we aim to install VOC removal equipment. In this regard, Mitsubishi Electric is now independently working to develop VOC removal equipment that works through plasma decomposition.

Material Balance of Chemical Substances Subject to Regulation

Released to atmosphere 705 t

Released to water 61 t

Recycled in-house 244 t

Recycled on-site 69 t

Treatment as waste 313 t

There were no releases to soil.

We are taking steps to properly control and reduce our largest category of releases—volatile organic compounds (VOCs).
Under our 4th Environmental Plan, we are aiming to reduce CO₂ emissions by 1.5% per year. We have also decided on tough new targets and strategies to achieve them.

Higher Voluntary Targets

Under its 4th Environmental Plan, the Mitsubishi Electric Group has established voluntary action targets to reduce CO₂ emissions from energy use during manufacturing (measured as “emissions intensity,” based on carbon-equivalent energy consumption per unit of net sales) by at least 25% by fiscal 2010 compared to fiscal 1990 levels. In order to reduce its emissions by 1.5% per year per unit of net sales, each factory is tackling emissions reductions according to a plan.

In fiscal 2004, Mitsubishi Electric Corporation’s CO₂ emissions amounted to 430,000 t-CO₂ (an increase of 3% over fiscal 2003). Emissions increased due to the large impact of higher energy consumption for air conditioning increased due to hot weather, and for manufacturing due to favorable business conditions in the Industrial Automation Systems division. The emissions intensity was 36% lower than in fiscal 1990 (a 2 point increase compared to fiscal 2003).

CO₂ emissions and emissions intensity based on net sales were both down considerably in fiscal 2003. This is due in particular to having divested a part of our Electronic Devices Business Unit (Renesas Technology Corp.). To exclude its effects, we recalculated the fiscal 1990 base year value of emissions per net sales for our voluntary targets, by removing the equivalent of Renesas’ emissions from the actual figures for fiscal 1990. By fiscal 2010, we will reduce our CO₂ emissions by an additional 46,000 tons from fiscal 2002 levels, which is a relatively high target, in order to fulfill our corporate responsibilities (see pages 13–15).

Results of Our Four Strategies in FY2004

In order to reduce our CO₂ emissions by 46,000 tons during the seven years leading up to fiscal 2010, we launched four strategies in fiscal 2004: installing highly energy-efficient equipment, conducting energy-loss minimization (EM) activities, installing cogeneration systems (CGS), and shifting to alternative fuels (see page 14).

As shown in the graph below, during fiscal 2004 we reduced emissions by a total of 6,184 t-CO₂, and invested a total of 1.532 billion yen (including government assistance of about 15 million yen) for the four strategies.

For installation of highly energy-efficient equipment we exceeded our target of a 3,600 t-CO₂ reduction by 114%. This we accomplished by replacing air conditioners, by controlled operation by installing multiple small boilers, and by the installation of exterior air exchangers, high-efficiency lighting equipment, and transformers. Regarding the EM activities, our successes have been limited to just a few factories, as the activities began in the middle of the year. For the cogeneration strategy, the advantages of cogeneration declined after the strategy had been decided, due to a drop in electricity process, so we are now reconsidering the situation. Regarding the conversion to alternative fuels, emissions have dropped considerably thanks to our having converted boilers from heavy fuel oil to natural gas.

Chemical Management & Reduction

We are taking steps to properly control and reduce our largest category of releases—volatile organic compounds (VOCs).

Results of 4 Energy Conservation Strategies (FY2004)

1. Install highly energy-efficient equipment
2. Energy-loss minimization project
3. Cogeneration
4. Convert to alternative fuels

Reduction Target for FY2010 (t-CO₂)

Reduction in FY2004 (t-CO₂) Investment in FY2004 (million yen)

25,000 4,031 1,438
8,000 214 45
9,900
4,000 1,872 48
46,000 6,184 1,532

Releases and Transfers Down 1.0% from FY2003

In fiscal 2004 the Mitsubishi Electric Group used 5,944 tons (110 types) of chemical substances (Mitsubishi Electric Corp. used 96 types). Releases and transfers amounted to 1,003 tons, a 1% decrease from fiscal 2003. The decrease was 18% in 2003, indicating that the rate of decrease has slowed. One reason for this is that there was no major factor to cause a reduction, such as selling-off a business unit. Besides this, decreases in chemical releases and transfers from ongoing efforts—such as opting for shifting to using lower-VOC coating paints and reducing the surface area of sheet metal to be coated—were not enough to offset increases due to higher production of factory automation equipment and electrical automotive equipment.

In the future, in order to steadily reduce our releases and transfers, we must introduce new strategies that will not affect productivity, and for that we aim to develop VOC removal equipment that works through plasma decomposition.

New Targets, Four Strategies for 2010

Under our 4th Environmental Plan, we are aiming to reduce CO₂ emissions by 1.5% per year. We have also decided on tough new targets and strategies to achieve them.

Breakdown of Energy Use

- Electricity
- City gas
- Kerosene
- Diesel
- Heavy fuel oil
- LPG

New Targets, Four Strategies for 2010

1. Install highly energy-efficient equipment
2. Energy-loss minimization project
3. Cogeneration
4. Convert to alternative fuels

Reducing VOC Emissions by Cutting Wastage, Using Alternatives, Using Removal Equipment, etc.

The Mitsubishi Electric Group has been conducting voluntary controls of chemical substances since 1997. We have entered information on the parts and materials procured into our chemical substance management system, and have prioritized which substances to reduce based on calculated substance usage and releases. We are now taking action to reduce releases, with the aim of an 18% reduction in fiscal 2006 compared to fiscal 2002.

Regarding the EM activities, our successes have been limited to just a few factories, as the activities began in the middle of the year. As for the cogeneration strategy, the advantages of cogeneration declined after the strategy had been decided, due to a drop in electricity process, so we are now reconsidering the situation. Regarding the conversion to alternative fuels, emissions have dropped considerably thanks to our having converted boilers from heavy fuel oil to natural gas.

Material Balance of Chemical Substances Subject to Regulation

Released to atmosphere 705 t

Released as product 4,462 t

Shipped as gas 475 t

Material Balance of Chemical Substances Subject to Regulation

Released to atmosphere 705 t

Chemical substances handled 5,944 t

Affiliates in Japan 1,276
Mitsubishi Electric 475

Recycled 244 t

Treated in-house 209 t

Recycled 244 t

Treated in-house 209 t

Released into public waters 511 t

Releases and Transfers

Released into sewerage system 91 t

Affiliates in Japan 1,521
Mitsubishi Electric 2,977

Affiliates in Japan 1,521
Mitsubishi Electric 2,977

There were no releases to soil.
Creating an Eco-Friendly Logistics System

We are reducing CO2 emissions by promoting “eco-logistics” (economy and ecology logistics), considering the reduce/reuse/recycle in packaging, and expanding our efforts to promote modal shifting.

Reducing CO2 Emissions by Modal Shifting

Products manufactured in the Kansai region and shipped to the Tokyo region account for Mitsubishi Electric's heaviest transport volume in Japan. We are in the process of switching from 10-ton trucks to 12-foot rail containers for this segment, and estimate that we can reduce CO2 emissions here by 83%.

As for imports from overseas, marine shipments from Shanghai in China to Kitakyushu in Japan, we are using special flat racks that can carry three JF Cargo 12-foot containers. From there the containers are separated for rail transport, and carried to distribution centers in western Japan. In the past we were shipping from China in 40-foot containers to Tokyo, where the containers were off-loaded and carried by truck to Mitsubishi Electric Home Appliances Co. in Saitama Prefecture. Today we are reducing CO2 emissions by shifting to rail transport. At the same time, we have been able to rapidly realize a new “integrated logistics system” for cargo between Japan and the rest of the world.

The CO2 emissions from logistics activities of the Mitsubishi Electric Group in fiscal 2004 amounted to 98,000 tons. We are aggressively working to reduce these emissions through our modal shift to rail and marine transport.

Rail and marine transport attributable to modal shifting in fiscal 2004 amounted to 10.7% of total transport volume, an increase of 10% compared to the same figure in fiscal 2003.

Expanding Activities to Reduce Wood Usage

In fiscal 2004, we used 48,000 tons of packaging, a 2% decrease from fiscal 2001 (used volume in fiscal 2004 rose by 5 points from fiscal 2003). Because product shipments increased, we will be reviewing our arrangements in fiscal 2005 and making further efforts to decrease the amount used.

The use of wood in fiscal 2004 amounted to 11,900 tons, a decrease of 5,000 tons (30%) compared to fiscal 2001. We made progress with non-wood alternatives for packaging of our main products, with a few exceptions, and are making a concentrated effort to find non-wood alternatives for those remaining products.

Wooden containers and packaging are still being used due to common business customs for both exports and domestic shipments, but for these products, we are working with customers to develop plans to shift away from wood. We are moving ahead with plans to achieve the complete elimination of wood for shipping our major products in Japan and overseas during fiscal 2005.

We are also working to replace wooden pallets (the second largest item for wood consumption after product packing) with pallets made of plastic and steel.

Reducing CO2 emissions from Logistics (FY2004)

<table>
<thead>
<tr>
<th>Mode</th>
<th>CO2 Emissions from Logistics (FY2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>1%</td>
</tr>
<tr>
<td>Ship</td>
<td>2%</td>
</tr>
<tr>
<td>Air</td>
<td>2%</td>
</tr>
<tr>
<td>Truck</td>
<td>95%</td>
</tr>
</tbody>
</table>

Share of Transport, by Mode (FY2004)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Amount used (10,000 t)</th>
<th>Index (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>0.2%</td>
<td>98.0</td>
</tr>
<tr>
<td>Ship</td>
<td>5.5%</td>
<td>98.0</td>
</tr>
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</tr>
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<td>98.0</td>
</tr>
</tbody>
</table>

Environmental Communication

We are continuing our activities to expand mutual understanding with our stakeholders—from various perspectives, including environmental efforts and our relationship with society.

Raising Interest in the Environment

In December 2004, we presented an exhibit at the Eco-Products 2004 Exhibition in Japan. The theme of our booth was “Mitsubishi Electric Group Eco-Products—Products that Expand Your World.” We announced the launch of our new business model “Un & Eco” in home appliances aiming at realizing sustainable society, introduced our energy-saving strategies and solutions to combat global warming, and displayed our Eco-Products for the home and the broader market. Visitors showed interest in many of our unique environmental technology advances, such as VOC treatment equipment and micro-bubble cleaning technology.

Advertising Promotes Environmental Initiatives

From January through March 2005, we ran an Asia-wide advertising campaign under the theme of “Comfort meets Ecology.” The ad campaign takes the approach that we are thinking about the environment together with our customers, while offering examples of how Mitsubishi Electric’s environmental technologies are making a difference every day in ways people might not have noticed. In the future, we plan to run similar series of ads introducing other devices and systems, and hope that people around the world will support our environmental initiatives.

Information on Our Global Website

This website uses Flash animation technology to help people understand our stance about contributing to society through products, business and technology, by illustrating the life-cycle concept to help understand environmental consideration.

http://global.mitsubishielectric.com/company/environment/
Creating an Eco-Friendly Logistics System

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Reaching More People through Reports and Other Publications

In our Environmental Sustainability Report 2004, the priority we give to our Corporate Philosophy and initiatives on the social and environmental dimension, and presented our vision as a corporation aware of its corporate social responsibility. Using the words of designers and engineers involved in actual product development, we included special feature pages describing the creation of Eco-Products. Many readers sent us valuable comments, and we are making use this feedback to improve our activities. Examples: “You’re doing well with the environmental aspects, but you need to improve your economic and social dimensions (for example by increasing the amount of objective data).” “The messages from employees on the features pages, with the insiders’ perspective on product development, were very interesting.” “The report should explain things with a more global perspective.”

Besides that report, each production facility and affiliated company also issues an environmental report, in order to promote communication with local communities.

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"Electricity powers the world today, and cannot be separated from the environment. I think Mitsubishi Electric can contribute to sustainable society through energy—in technology, R&D, products and business. I think it’s important to spread this kind of message to the world. We will continue to make use of the latest web technology to spread information in a timely and effective way about Mitsubishi Electric’s environmental activities."

Kevin Hamilton, Overseas Advertising Group, Communications Department
For Our Stakeholders

As a company with committees, we are working for ever more dynamic management and transparency. We make an effort to respond to the expectations of our stakeholders, including but not limited to customers, shareholders, suppliers, and employees, etc.

Separation of the Executive Function from the Supervisory Function

Under the governance structure of Mitsubishi Electric, we have applied the Company with Committees system and separated the roles of President (who serves as the Chief Executive Officer), and the Chairman of the Board, and have strengthened management supervisory function of the Board of Directors.

In addition, by limiting the number of board members who also serve as executive officers, we are running the company now in such a way that the majority of members of the Board of Directors do not serve simultaneously as executive officers. Persons who are to serve in both roles are selected based on their actual function as executive officers. In particular, in addition to the President/CEO, we are limiting number the executive officers to a few persons whose functions relate closely to the issues discussed by the Board of Directors (i.e., related to human resources, accounting, etc.).

Ensuring Synergies and Effectiveness of Committees

The Auditing Committee will work to increase the sharing of information with the internal audit organization and external auditing bodies (financial auditors), with the aim of strengthening the synergies and effectiveness of the management auditing function. In order to ensure greater effectiveness of management supervision, neither the Chairman of the Board nor the President/CEO will sit on the Nomination Committee (which decides on candidates for the board) or the Compensation Committee (which decides on compensation policies and actual compensation for board and executive members).

Also, we are conducting deliberations regarding corporate ethics, social contributions, and corporate information, by establishing committees including the Corporate Compliance Committee, the Philanthropy Committee, and the Corporate Information Committee.

Corporate Governance Structure of Mitsubishi Electric

Executive Officers’ Meeting

President & CEO

Executive Officers

Corporate Governance Committee

Philanthropy Committee

Corporate Information Committee

General Shareholders’ Meeting

Secretariat (Law Department)

Legal Compliance Office

Ethics and Legal Compliance Hotline

Legal Compliance Manager

Key Personnel for Legal Compliance

Corporate Governance Committee

Appointing

Chairperson

Auditing Committee*

Nomination Committee*

Compensation Committee*

Supervision

Board of Directors

Reporting to

Execution

Corporate Ethics, Legal Compliance, and Information Security

Mitsubishi Electric is taking two approaches to promote full legal compliance: good institutional design of the organization system and good employee awareness. Our approach with all confidential corporate and personal information has the goal of ensuring secure management of such information.

Complying with Laws and Regulations, Establishing a Keen Sense of Ethics

The Mitsubishi Electric Group has established its own Corporate Ethics and Legal Compliance Statement (hereinafter referred to as the “Corporate Ethics, Legal Compliance Statement”), which consists of six basic principles: Compliance with the Law, Respect for Human Rights, Contribution to Society, Collaboration and Harmony with the Community, Consideration of Environmental Issues, and Awareness of Personal Integrity. Besides providing all personnel with cards carrying this statement, we also aim to foster and spread legal compliance in various other ways, such as by displaying posters and distributing booklets with the same messages.

In 1991, we created a systematic legal compliance structure in the Group by establishing the Corporate Compliance Committee, which is responsible for promoting legal compliance activities and creating codes of conduct. The current structure reflects the revisions based on lessons from violations of Japan’s Antimonopoly Law in 1995.

In addition, when necessary, personnel from the relevant divisions are called together to deal in a timely manner with risk management issues.

Statement of Six Principles, Institutional Design for Compliance

In 2003, Mitsubishi Electric conducted a major revision of the “Company Regulations on the Protection of Personal Information”, which entered into effect in 2001, and during fiscal 2004 established an organizational structure to implement the regulations. The Chief Officer for Protection of Personal Information (the Executive Officer for General Affairs) administers the overall management of the company, the Manager for Protection of Personal Information (General Manager of the General Affairs Department of Head Office) and his Secretariat are to plan and implement policies. The General Manager of the Information Systems Technical Center is responsible for promoting information systems security.

At the Business Groups, which actually use and manage personal information, it is the protection officer (the Group President of each Business Group) and the implementation managers (factory General Managers who are responsible for information control, and they develop policies in cooperation with the Secretariat). In addition, Mitsubishi Electric makes its policies known to affiliated companies in Japan in an effort to achieve common awareness throughout the Group.

The proper management of confidential corporate information is not only a responsibility under Japan’s Law on the Protection of Personal Information, which recently entered into force, and under Japan’s amended unfair competition prevention law, but is also strongly expected to be a part of corporate social responsibility. It is in this context that Mitsubishi Electric decided to apply information security measures—which until now have been applied from the organizational, personal, physical and technical perspectives—to cover confidential corporate information as a whole, including confidential business and technical information, and Intellectual property, etc. It is for these reasons that on February 16, 2004, the company declared its Statement on the Management of Confidentia

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Corporate Governance Structure of Mitsubishi Electric

General Shareholders' Meeting
Reporting to
Appointment

Executive Officers' Meeting
Appointment, Dismissal, Supervision

Board of Directors
Chairperson
Auditing Committee*
Nomination Committee*
Compensation Committee*

Corporate Compliance Committee
Philanthropy Committee
Corporate Information Committee

Corporate Ethics, Legal Compliance, and Information Security

Complying with Laws and Regulations, Establishing a Keen Sense of Ethics

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Corporate Ethics, Legal Compliance, and Information Security

Promoting Full Legal Compliance Everywhere

We are making an effort to ensure that each affiliated company outside of Japan—in the Americas, Europe, and Asia—establishes its own corporate code of ethics that reflects the local laws and regulations, culture and customs, and through compliance committees and other means is promoting full implementation of that code. The Mitsubishi Electric Corporate Ethics and Compliance Statement is at the core of those efforts.

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Management of Confidential Corporate Information

System for Protection of Personal Information

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Our Goal: To Be the Most Competitive Everywhere We Operate

Mitsubishi Electric creates a corporate culture where employees can work as professionals and achieve challenging goals. We promote positive action to help women realize their full potential, and aim to be a company that people value highly as a place to work.

New Personnel System Emphasizes Work Performance and Optimal Utilization of the Workforce

Under our new compensation system, revised in March 2004, we place an emphasis on creating an environment where each employee is aware of the organization’s objectives and his or her own role, an organization where people can enhance their own value, and can challenged to strive for higher goals. In order for this system to function effectively, it is important that three key components work synergistically: evaluation/compensation, skills development, and effective workforce utilization. Also, in order to ensure that the roles and achievements of each employee can be directly reflected in their compensation and recognition, it is important to offer opportunities for job transfers and advancement depending on each person’s own capabilities. In this respect, we have made changes to better support our compensation system, including the Career Challenge Program,1) the Grievance Resolution System,2) and the Survey Program.3)

For employees interested in starting a new life after leaving the company, we have established a multi-track personnel system that supports various work styles for people fifty and over.

1) A system that aims to generate potential transfer opportunities and to re-employ wishes. A job transfer program based on declaration made by participants, it helps to make career plans of participants more realistic and concrete.
2) A system that facilitates efforts to resolve the concerns or grievances of individuals in a fair and transparent way, in order to ensure that personnel are satisfied with their compensation and evaluations.
3) A program to understand the personnel compensation system is being implemented properly, and to reflect any changes necessary to improve the personnel system. It is based on surveys of all employees.

Promoting Positive Action and Employment for Persons with Disabilities

To grow as a global corporation, it is important to foster a corporate environment that accepts diversity, regardless of gender, nationality or age.

Under this effort, we have a proactive approach to help women realize their full potential at work. We offer a series of training programs, and work to create an environment where women can fairly demonstrate their capabilities. For example, we support employees who desire to have both a career and a family by offering childcare leave4) and shorter working hours for parents who are caring for their children.5) Our conditions are more generous than the legally required standards. Japan is experiencing shortages in the future workforce due to the country’s declining birthrates. In this context, from the perspective of utilizing valuable human resources, it is important for an organization to make the greatest possible use of the capabilities of its employees, whether they be male or female. It is worth noting that many Mitsubishi Electric products reflect female tastes due to the fact that women are important influence of purchase decisions, and we recognize the importance of designing products and develop new markets with the women’s perspective in mind.

Moreover, we are also working to encourage employment for persons with disabilities, and are proactive in creating work environments that make it easy for these individuals to live with disabili- ties account for 1.96% of our workforce (2004), which is above the legally stipulated rate of 1.8 percent.

4) Childcare leave: Maximum leave is until the end of September after the child reaches the age of one.
5) Shorter working hours for parents providing childcare: Maximum is until child reaches end of first grade of primary school.

New Integrated Personnel System

Employment of Disabled Persons

<table>
<thead>
<tr>
<th>(%)</th>
<th>Legislated hiring rate</th>
<th>Mitsubishi Electric average rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
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<tr>
<td>2003</td>
<td>2.0</td>
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</tr>
<tr>
<td>2004</td>
<td>2.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

(a) Manufacturing industry
(b) Electrical and electronic product manufacturers
(c) Mitsubishi Electric
(figure per million work hours)

“Second Life” Support System

- Family leave, including parental leave
- Caregiver leave for the head of the household

“Life Design 50” and “Career Plan Option”

Multi-Track Personnel System Branches from the Core Career Track

For employees in their fifties who can choose one of three styles of work lives.

“Second Life” (for persons with disabilities)

One can choose between working an additional ten years or leaving the company.

Multi-Track Personnel Systems

- Employment of Disabled Persons
- Promotion and Development of Personnel with Disabilities
- Multi-Track Personnel Systems
- “Second Life” Support System
- “Life Design 50” and “Career Plan Option”

Society

Energy

Sustainability

Safety, Hygiene, and Education

Our Workplace: Healthy! Comfortable! Safe!”

Under this slogan, we are promoting the creation of a workplace environment where each and every employee can work in safety and comfort. We provide a broad range of programs and support for employees, who aim to reach challenging goals, and are promoting human rights awareness, as well as corporate ethics, compliance, and environmental education.

“Zero Danger!” by Eliminating Potential Risks

Mitsubishi Electric aims to create a new culture of safety by shifting from the phrase “Do not let accidents to “Zero danger.” We address employee safety and health in four categories: “safety management,” “construction and work safety management,” and “traffic safety management.” Also, we are promoting activities to eliminate the potential causes of danger by our risk management and improvement of our safety and hygiene management system based on Mitsubishi Electric’s own Labor Safety and Health Management System.

In addition, we have created our own independent standards that surpass regulatory requirements, in order to provide a good working environment. Our approach includes every aspect—the air, visual, and sound environments as well as the facilities where people work, etc. Also, we work to create comfortable workspaces that consider the older workers and people with disabilities. We have also been creating separate smoking areas in an effort to prevent exposure to second-hand smoke.

Care for Mental and Physical Health Based on Improved Targets

The Mitsubishi Electric Group Health Plan 21 serves about 100 employees and includes a range of activities. Under the slogan of “Change your Lifestyle Habits, Extend Your Healthy Years,” these activities offer tools to maintain and improve health, by encouraging employees to set ten-year health improvement goals in five areas: maintaining proper body weight, creating an active lifestyle, stopping smoking, managing proper dental care, and improving stress management skills.

To promote not only physical health but also mental health maintenance, we also work to take care of mental concerns such as day-to-day work and family issues, by providing counselors at the head office as well as each factory. In addition, we offer seminars on mental health and other topics for managers, as well as personal stress management techniques for employees (for example, on ways to manage stress).

Creating an Environment for Personal Competency Development

Personal awareness is the foundation of competency development. Whether one wishes to be better able to handle current and future duties, or to develop one’s career, competency development requires a person’s self-motivation and enthusiasm. At Mitsubishi Electric, we are systematically offering a variety of trainings and educational programs, and work to create the environment where employees can take the initiative to develop their abilities. We provide venues for group trainings at centers in the cities of Kamakura, Mita and Kobe, and are also creating the infrastructure for learning-on-demand through an extensive e-learning program.

Human Rights Awareness, Corporate Ethics, Compliance, and Environmental Education

Mitsubishi Electric fosters and puts into practice the spirit of respect for human rights, including in-house human rights awareness trainings and the hiring of persons with disabilities, as well as human rights awareness-raising activities outside the company. We are serious about addressing issues of sexual harassment, personal information, and privacy, etc.

We provide trainings for new employees on corporate ethics and compliance soon after their arrival, and in a regular manner. As the importance of conducting themselves in ways that comply with social standards and the demands of corporate social responsibility, and to make them aware of the linkage of these standards to their own duties in the company. We also aim for a high level of awareness by distributing the “Code of Conduct for Corporate Ethics and Compliance” in booklet form.

Timely Response is the Key

Mayumi Kaneko
Counselor

“When you come to this room on the ninth floor of the head office once a week to offer counseling services, the most common concerns are about work, the workplace, and personal relations at work. In most cases, this starts out with a person coming to talk alone, but in some cases to address concerns properly, we end up with the boss and colleagues also joining in the discussions. I also give advice, particularly to managers, if it appears that there is some problem with their co-workers and subordinates. We try to notice problems and address them before they become more serious.”

Figures as of March 2005

Economy

Society

Safety, Hygiene, and Education
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New Integrated Personnel System

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2. A system that facilitates employees to realize the concerns or grievances of individuals in a fair and transparent way, in order to ensure that personnel are satisfied with their compensation and evaluations.

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Promoting Positive Action and Employment for Persons with Disabilities

To grow as a global corporation, it is important to foster a corporate environment that accepts diversity, regardless of gender, nationality or age. In order to achieve this, we have a proactive approach to help women realize their full potential at work. We offer a series of training programs, and work to create an environment where they can fully demonstrate their capabilities. For example, we support employees who desire to have both a career and a family by offering childcare leaves9 and shorter working hours for parents who are caring for their children.10,11 Our conditions are more generous than the legally required standards.

Japan is experiencing shortages in the future workforce due to the country’s declining birthrates. In this context, from the perspective of utilizing valuable human resources, it is important for an organization to make the greatest possible use of the capabilities of its employees, whether they are male or female. It is worth noting that many Mitsubishi Electric products reflect female tastes due to the fact that women are important users and influencers of purchase decisions, and we recognize the importance of designing products and developing new markets with the woman’s perspective in mind.

Meanwhile, we are also working to encourage employment for persons with disabilities, and are proactive in creating work environments that make it easy for them to work. Mitsubishi Electric accounts for 1.9% of our workforce (2004), which is above the legally stipulated rate of 1.8 percent.

1. Children leave: Maximum leave is until the end of September after the child reaches the age of one.

2. Shorter working hours for parents providing childcare: Maximum is until child reaches end of first grade of primary school.

Employment of Disabled Persons

<table>
<thead>
<tr>
<th>Year</th>
<th>Discharged (in-1 system)</th>
<th>Retirement (in-1 system)</th>
<th>Retirement (re-hired workers)</th>
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</thead>
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<tr>
<td>2000</td>
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<td>2.0</td>
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<tr>
<td>2001</td>
<td>1.0</td>
<td>2.0</td>
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<tr>
<td>2002</td>
<td>1.0</td>
<td>2.0</td>
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<tr>
<td>2003</td>
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</tr>
<tr>
<td>2004</td>
<td>1.0</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>

“Zero Danger!” by Eliminating Potential Risks

Mitsubishi Electric aims to create a new culture of safety by shifting from the philosophy of “zero accidents” to “zero danger.” We address employee safety and health in four categories: “safety management,” “construction and work safety management,” and “traffic safety management.” Also, we are promoting activities to eliminate the potential causes of danger by our risk management and improvement of our safety and hygiene management system based on Mitsubishi Electric’s own Labor Safety and Health Management System.

In addition, we have created our own independent standards that surpass legislated requirements, in order to provide a good working environment. Our approach includes every aspect—the air, visual, and sound environments as well as the facilities where people work. Also, we work to create comfortable workspaces that consider the older workers and people with disabilities. We have also been creating separate smoking areas in an effort to prevent exposure to second-hand smoke.

Care for Mental and Physical Health Based on Improved Targets

The Mitsubishi Electric Group Health Plan 21 serves about 100,000 employees and includes a range of activities. Under the slogan of “Change your Lifestyle Habits, Extend Your Healthy Years,” these activities offer tools to maintain and improve health, by encouraging employees to set ten-year health improvement goals in five areas: maintaining proper body weight, creating an active lifestyle, stopping smoking, maintaining proper dental care, and improving stress management skills.

To promote not only physical health but also mental health maintenance, we also work to take care of mental concerns such as day-to-day work and family issues, by providing counselors at the head office as well as each factory. In addition, we offer seminars on mental health and other topics for managers, as well as personal environment techniques for employees (for example, on ways to manage stress).

Results assessment

- Evaluation/compensation
- Career plan
- Grievance resolution system
- Survey system

New Personnel System Emphasizes Work Performance and Optimal Utilization of the Workforce

- New Integrated Personnel System
- Promoting Positive Action and Employment for Persons with Disabilities
- Employment of Disabled Persons

“Zero Danger!” by Eliminating Potential Risks

- Care for Mental and Physical Health Based on Improved Targets

Our Workplace: Healthy! Comfortable! Safe!”

Under this slogan, we are promoting the creation of a workplace environment where each and every employee can work in safety and comfort. We provide a broad range of programs and support for employees, who aim to reach challenging goals, and are promoting human rights awareness, as well as corporate ethics, compliance, and environmental education.

Creating an Environment for Personal Competency Development

Personal awareness is the foundation of competency development. Whether one wishes to be better able to handle current and future duties, or to develop one’s career, competency development requires a person’s self-motivation and enthusiasm. At Mitsubishi Electric, we are systematic in offering a variety of trainings and educational programs, and work to create the environment where employees can take the initiative to develop their abilities. We provide venues for group trainings at centers in the cities of Kamakura, Mita and Kobe, and are also creating the infrastructure for learning on demand through an extensive e-learning program.

Human Rights Awareness, Corporate Ethics, Compliance, and Environmental Education

Mitsubishi Electric fosters and puts into practice the spirit of respect that recognizes important values and initiatives, including in-house human rights awareness trainings and the hiring of persons with disabilities, as well as human rights awareness-raising activities outside the company. We are serious about addressing issues of sexual harassment, personal information, and privacy, etc.

We provide trainings for new employees on corporate ethics and compliance soon after their order to take our “Zero Danger! by Eliminating Potential Risks” and the awareness of the importance of conducting themselves in ways that comply with social standards and the demands of corporate social responsibility, and to make them aware of the linkage of these standards to their own duties in the company. We also aim for a high level of awareness by distributing the “Code of Conduct for Corporate Ethics and Compliance” in booklet form.

Timely Response is the Key

Mayumi Kameko
Counselor

“I come to this room on the ninth floor of the head office once a week to offer counseling services. The most common concerns are about work, the workplace, and personal relations at work. Most cases, this starts out with a person coming to talk alone, but in some cases to address concerns properly, we end up with the boss and colleagues also joining the discussions. I also give advice, particularly to managers, if it appears that there is some problem with their co-workers and subordinates. We try to notice problems and address them before they become more serious.”

Life Design 50

(revised option)

“Second Life” support system

(revised retirement procedures)

Retirement (at retirement age)

Retirement (at retirement age)
**Product Quality, the Top Priority**

Mitsubishi Electric is implementing its "Changes for the Better" concept, which looks at things from the customer perspective, and is expanding quality assurance and quality improvement initiatives throughout the company. Our goal is high customer satisfaction, and we aim to offer a level of service that will impress our customers.

"Changes for the Better" is the Mitsubishi Electric Group’s corporate statement; it means that we continually innovate for the better.

We will act with the determination for each and every person to innovate, with a global perspective. [http://global.mitsubishelectric.com/changes/changes.html](http://global.mitsubishelectric.com/changes/changes.html)

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**Mitsubishi Electric’s Basic Philosophy: “Service Through Quality”**

In 1952, Mitsubishi Electric made “Service Through Quality” its corporate motto, and a decade later expanded this to make product quality the top priority by setting the “Memorandum on Product Quality” into the company constitution. To this day, this spirit has been maintained through four basic philosophies.

Mitsubishi Electric’s four basic philosophies about product quality are as follows: “Product quality is our top priority. It comes before price and on-time delivery.” “Whatever the sacrifice, our commitment to good quality does not waver.” “Products must be safe to use, have a long usage life, and have consistent performance.” “Every manager and employee involved in manufacturing a product shares equal responsibility for the product quality.”

Under this basic philosophy, we are enhancing quality assurance and quality improvement by setting company-wide regulations relating to quality assurance, and by respecting laws and standards relating to product quality. For every product, each factory inside and outside Japan takes responsibility for guaranteeing and takes concrete actions to improve quality.

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**Customer Response Center Operates 365 Days a Year**

For our Living Environment & Digital Media Equipment business group, we have created a customer satisfaction system that is integrated with each company in the Mitsubishi Electric Group. For home appliances, we have created a Customer Response Center and Service Center that operate 365 days a year, 24 hours a day. We also operate an on-line Technical Support Center, a telephone-based call system that is open seven days a week to provide advice on technical issues. For installation of air conditioners we have created a technical support service with our Air Conditioning “One-Call” System at our Air Conditioner Support Center. We have introduced an integrated computer-based call system that facilitates accurate responses to inquiries, effective in-house sharing of information, and rapid feedback to the relevant departments.

- Quality Assurance and Improvement System

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**Quality Built In from the Design Stage**

We have created a company-wide system of quality assurance and quality improvement activities, and are implementing them consistently. We implement timely responses and strategies for risk management, and share their results simultaneously throughout the company, using them as feedback into risk-prevention activities. In addition, we are spreading information company-wide on product quality, improvements and strategies, from the design and manufacturing stages until after the product is shipped to the customer. In terms of quality improvement activities, we are conducting concrete activities at the company-wide level, such as by building in quality at the development and design stage, improving the quality of produced products, and improving quality at the manufacturing stage.

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**A Long-Term Commitment to People-to-People Involvement and Support**

In philanthropic activities in Japan and overseas, Mitsubishi Electric is committed to five areas—social welfare, local communities, global environmental protection, science and technology, and sports and culture. We emphasize continuity and systematic approaches to these activities.

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**Global Activities through Our Foundations**

Mitsubishi Electric has established the Philanthropy Committee and through close cooperation with foundations in the United States and Thailand as well as the SOCIO-ROOTS Fund is working to contribute to society as an entire corporate group. The Mitsubishi Electric America Foundation (MEAF) was established in 1991, to provide support for persons with physical disabilities in the United States. In 2000, the foundation’s support for the AFBI Internship Program received high recognition when Mitsubishi Electric became the first Japanese corporation ever to receive the well-respected Helen Keller Achievement Award. In Thailand, the Mitsubishi Electric Thai Foundation provides scholarships to university students and runs a lunch support program for elementary schools. At all overseas operations including those in Europe, Mitsubishi Electric is involved in a range of activities, including support for people with disabilities, care for hospitalized children, and the sharing of Japanese culture.

In response to the Sumatran earthquake and Indian Ocean tsunami disaster in 2004, the Mitsubishi Electric Group supported relief efforts through donations such as to the Royal Thai Foundation.

- Five Key Areas of Philanthropy
- Social Welfare
- Local Communities
- Global Environment
- Science and Technology
- Institutional Arrangements for Philanthropic Activities

**Matching Gift Program Also Targets Disaster Relief**

The SOCIO-ROOTS Fund started in 1992, and is a matching gift program through which this company matches donations from employees. The Fund accepts donations from employees at factories and branches in Japan year-round, and has been accepted for more than 13 years since it was established accepted 863 donations amounting to over 400 million yen (about U.S.$360 million). In the past the funds were given to social welfare facilities and their supporting organizations, but in recent years the criteria have been widened to include disaster-related causes. In fiscal 2004, 51 million yen (about U.S.$46 million) were donated to social welfare facilities as well as relief efforts to a major earthquake in the Chuetsu region of Niigata Prefecture in Japan. Because individuals donating more than 50,000 yen can designate how those funds are to be used, they have the opportunity to express their volunteer spirit in a way that suits them.

1: American Foundation for the Blind

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**Philanthropy**

- Mitsubishi Electric co-sponsors a musical competition that opens doors for aspiring classical musicians in Spain. Winners were presented with awards and gave a concert at the Palau de les Arts Reina Sofia, an historic concert hall in Barcelona.

- Mitsubishi Electric’s CSR web site offers a range of pages including information about the company, examples of corporate social responsibility, and pages on its global initiatives. [http://www.mitsubishelectric.com](http://www.mitsubishelectric.com)

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**Business Group**

- Executive Officer in Charge of Quality Assurance
- Corporate Secretary

**Business Group**

- President
- Executive Officer in Charge of Quality Assurance
- Business Group

**Business Group**

- Head of Business Group
- Head of Business Group

**Business Group**

- Quality Assurance Manager
- Quality Assurance Manager

**Business Group**

- Quality Assurance Manager
- Quality Assurance Manager

**Business Group**

- Technical Committee on Product Quality
- Technical Committee on Product Quality

**Business Group**

- General Meeting of Shareholders
- General Meeting of Shareholders

**Business Group**

- Mitsubishi Electric Thai Foundation
- Mitsubishi Electric Thai Foundation

**Business Group**

- Japan
- Japan

**Business Group**

- International Operations
- International Operations

**Business Group**

- Factory/Office
- Factory/Office

**Business Group**

- Mitsubishi Electric America Foundation
- Mitsubishi Electric America Foundation

**Business Group**

- President
- President

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“I think this Customer Response Center will become increasingly important in the future.”

Hironi Takeda, Customer Service Group, Mitsubishi Electric Life-Network Co., Ltd.
**Product Quality, the Top Priority**

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―Hiromi Takeda, Customer Service Group, Mitsubishi Electric Life-Network Co., Ltd.

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3. Quality Assurance and Improvement System

4. We opened a Customer Response Center in 1987 that can answer customer questions from 9 a.m. to 5 p.m. We also operate an on-line Technical Support Center, a telephone-based call system that is open seven days a week to provide advice on technical issues. For installation of air conditioners we have created a technical support service with our Air Conditioning “One-Call” System at our “Air Conditioner Support Center.” We have introduced an integrated computer-based call system that facilitates accurate responses to inquiries, effective in-house sharing of information, and rapid feedback to the relevant departments.

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―Hiromi Takeda, Customer Service Group, Mitsubishi Electric Life-Network Co., Ltd.
Corporate Profile and Business Overview

Sales

Name: Mitsubishi Electric Corporation
Head Office: Mitsubishi Denki Building, 2-2-3 Marunouchi, Chiyoda-ku, Tokyo 100-8310, Japan
Established: January 15, 1921
Paid-in Capital: 175.8 billion yen
Employees: 97,661 (consolidated) 27,319 (non-consolidated)
Sales: 3,4106 trillion yen (consolidated) 2,0220 trillion yen (non-consolidated)

Sales by Division

Energy and Electric System
- Standard Elevator, Minus the Machine Room "AXIEZ"
  - Turbine generators
  - Water-wheel generators
  - Nuclear-power equipment
  - Electric motors
  - Transformers
  - Power electronics equipment
  - Circuit breakers
  - Gas insulated switchgears
  - Supervisory control and protection systems
  - Transportation equipment
  - Elevators and escalators
  - Others

Industrial Automation Systems
- Programmable logic controllers
- Inverters
- AC servos
- Factory automation systems
- Induction motors
- Hosts
- Molded-case circuit breakers
- No-fuse breakers
- Earth leakage circuit breakers
- Distribution transformers
- Electric meters
- Industrial sewing machines
- Computerized numerical controllers
- Electrical-discharge equipment
- Laser processing equipment
- Industrial robots
- Clutches
- Car audio products
- Car navigation systems
- Electrical automotive equipment
- Car electronics equipment
- Others

Information and Communication Systems
- Wireless communications equipment
- Mobile handsets
- Wire communication equipment
- Satellites
- Radar equipment
- Antennas
- Guided projectiles
- Fire control systems
- Waveguides
- Rocket electronics equipment
- Aircraft electronics
- Medical electronic equipment
- Broadcasting equipment
- Data transmission equipment
- Mainframe computers
- Servers
- Office computers
- Personal and mobile computers
- Peripheral devices
- Others

Electronic Devices
- Power devices, power modules
- RF elements
- Optical elements
- Optical devices
- Display monitors
- Cathode-ray tubes
- LCD displays
- Printed circuit boards
- Others

Home Appliances
- Air Conditioning Systems
  - "Replace" model air conditioner allows quick installation to replace old units. Mitsubishi Electric leads the industry with the "Precision" system, reducing wait and riding times and alleviating user stress.
- Energy and Electric System
- Industrial Automation Systems
- Information and Communication Systems
- Electronic Devices
- Home Appliances

Number of Affiliated Companies by Region

Europe: 32 companies
China: 24 companies
North America: 22 companies
Japan: 128 companies
Taiwan: 5 companies
Asia (except Japan, China and Taiwan): 26 companies

Mitsubishi Electric Group's CSR
Corporate Profile and Business Overview

Sales

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
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<tbody>
<tr>
<td>Sales</td>
<td>23,192</td>
<td>18,953</td>
<td>20,220</td>
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<td>(million yen)</td>
<td>38,393</td>
<td>33,865</td>
<td>34,106</td>
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Company Profile (March 31, 2006)

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Energy and Electric Systems

- **Standard Elevator, Minus the Machine Room “AXEIZ”**
  - The first complete model redesign in four years, incorporating efficient use of space, control, and universal design features. Standardization of equipment and control system, reducing wait and riding times and alleviating user stress.

Industrial Automation Systems

- **MELSEC Series—Programmable logic controllers**
  - The MELSEC Series of programmable logic controllers (PLCs) play a supporting role in the control of production facilities and information management. Owing to its range of functions, strong performance, broad model lines, and high reliability, the MELSEC Series is especially suited to the construction of cutting-edge production facilities and is Japan’s top brand name in the field.

Information and Communication Systems

- **Mobile Phones**
  - Mitsubishi Electric offers value-added, innovative new uses and other compatible with 3G (third-generation) services, terrestrial digital broadcasting and other mobile phone advances.

Electronic Devices

- **DIP-IPM® Super-Small Package, Version 4 Series**
  - High-reliability insulated-gate bi-polar transistor (IGBT) package size by 80% (154/854V), helping to realize the size of inverters in home appliances. Completely lead-free design is good for the environment.

Home Appliances

- **Air Conditioning Systems**
  - “Replace” model air conditioner allows quick installation to replace old units. Mitsubishi Electric leads the industry with the “Comfort” sample, which replaces old units without changing room temperature. Future product development trends will be "environment, health, communication."

Number of Affiliated Companies by Region

- **Europe:** 32 companies
- **China:** 24 companies
- **Taiwan:** 5 companies
- **Japan:** 128 companies
- **Asia (except Japan, China and Taiwan):** 26 companies

Sales by Division

- **Home Appliances** 17.3%
- **Energy and Electric System** 34.2%
- **Electronics Devices** 4.3%
- **Information and Communication Systems** 18.8%
- **Industrial Automation Systems** 22.8%
- **Molded-case circuit breakers** 20.0%
- **Factory automation systems**
- **Other** 15.3%

Sales by Region

- **Japan** 69.8%
- **Asia** 12.2%
- **North America** 9.3%
- **Europe** 7.7%
- **Oceania** 4.0%
- **Others** 10.0%

Number of Affiliated Companies by Region

- **Europe:** 32 companies
- **China:** 24 companies
- **Taiwan:** 5 companies
- **Japan:** 128 companies
- **Asia (except Japan, China and Taiwan):** 26 companies

Affiliates in Japan

- Telecommunications service companies
- Engineering service companies
- Manufacturing companies
- Trading companies, etc.
- Marketing companies

Overseas Affiliates

- Sales company
- Research Center
- Manufacturing company
- Others

Affiliates counted include companies in which Mitsubishi Electric Corporation holds 20% or more of equity.

Environmental Sustainability Report 2005

Fiscal year 2004

Company Pr

Information and

Wireless communications equipment

Wire communication equipment

Molded-case circuit breakers

Emergency new uses and other compatible with G3 (third-generation) services.

Factory automation systems

Electrical-discharge equipment

Lighting fixtures

Packaged air conditioners

Cathode-ray tubes

Laser processing equipment

Digital broadcasting and other mobile phone advances.

Color televisions

Projection televisions

Video projectors

VCRs

DVDs

Room air-conditioners

Package air conditioners

Refrigerators

Electric fans

Washing machines

Ventilators

Photovoltaic power generating systems

Electric water heaters

Fluorescent lamps

Lighting fixtures

Clean heaters

Compressors

Freezers

Humidifiers

Dehumidifiers

Air purifiers

Air-conditioning systems

Commercial refrigeration units

Showcases

Vacuum cleaners

Microwave ovens
For further information, please contact

Mitsubishi Electric Corporation, Corporate Environmental Sustainability Group, 2-2-3 Marunouchi, Chiyoda-ku, Tokyo, 100-8310, Japan
Tel: +81-3-3218-9024  Fax: +81-3-3218-2465
E-mail: eqd.eco@hq.melco.co.jp

Please note our new address, effective November 7, 2005 (telephone and fax will not change).

Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo, 100-8310, Japan
E-mail: eqd.eco@pj.MitsubishiElectric.co.jp