National/Panasonic

Environmental Sustainability Report 2002

Matsushita Electric Group

Environmental Sustainability Report 2002

Corporate Profile

Matsushita Electric Industrial Co., Ltd.

Address: 1006 Kadoma, Kadoma-city, Osaka 571-8501, Japan

Phone: +81-6-6908-1121 (main representative)

Incorporated on December 15,1935

Established on March 7,1918

President and Representative Director: Kunio Nakamura

Capital: ¥258.7 billion

Number of Employees: 267,196 (Japan) 124,212 (Overseas) 142,984

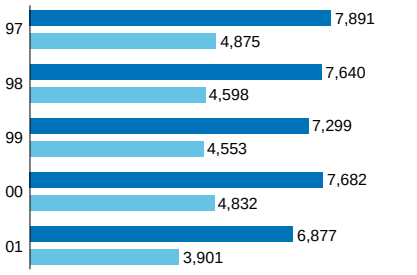
Stock Exchange Listings: Tokyo, Osaka, Nagoya, Fukuoka, Sapporo, New York, Pacific, Amsterdam, Frankfurt, Dusseldorf, Paris

Notes

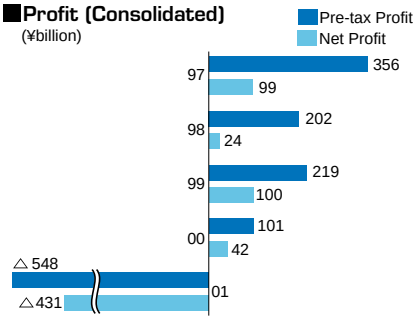
- Matsushita's consolidated settlements of accounts are based on U.S. accounting standards.
- Reductions in corporate taxation rates, in line with the revision of the taxation system, resulted in effects on net income (consolidated) of ¥27.5 billion for FY 1997 and ¥42.1 billion for FY 1998.
- As of March 31, 2002, companies included in the consolidated settlements of accounts (parent and subsidiaries) totaled 304 companies, and the affiliates (where the equity method applies) totaled 46 companies.

Corporate Outline and Financial Information
http://www.matsushita.co.jp/ir/en/

Net Sales (¥billion)

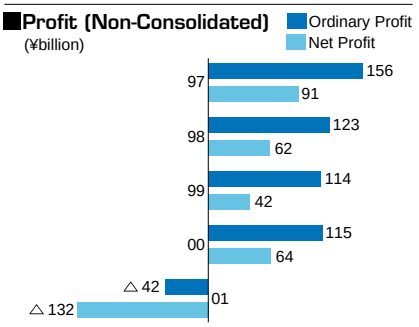


Profit (Consolidated) (¥billion)

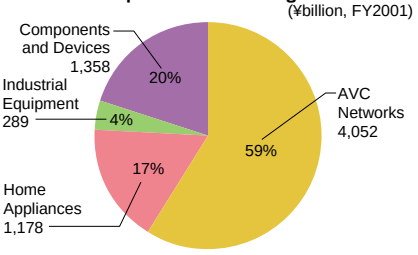


Number of Employees (at the end of fiscal year)

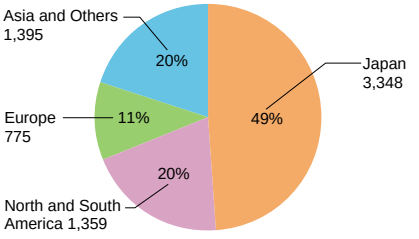
Profit (Non-Consolidated) (¥billion)



Net Sales per Business Segment (¥billion, FY2001)



Net Sales per Region (¥billion, FY2001)



Scope of Reporting

Reporting Period

Fiscal 2001 (April 2001 - March 2002)

Reporting Scope

This report covers the Matsushita Electric Industrial Co., Ltd. and the worldwide subsidiaries of its ten main affiliated companies.

- **Matsushita Electric Industrial Co., Ltd.**
  Major Division Companies:
  AVC Company, Home Appilance & Housing Electronics Company, Air-Conditioner Company, Packaged Air-Conditioner Company, Motor Company, Semiconductor Company, Display Devices Company, Lighting Company, Factory Automation Company
- **Matsushita Communication Industrial Co., Ltd.**
- **Matsushita Electronic Components Co., Ltd.**
- **Matsushita Industrial Equipment Co., Ltd.**
- **Matsushita Battery Industry Co., Ltd.**
- **Matsushita Refrigeration Company**
- **Kyushu Matsushita Electric Co., Ltd.**
- **Matsushita Seiko Co., Ltd.**
- **Matsushita Graphic Communication Systems, Inc.**
- **Matsushita Kotobuki Electronic Industries, Ltd.**
- **Victor Company of Japan, Ltd.**
  Included from fiscal 2001.

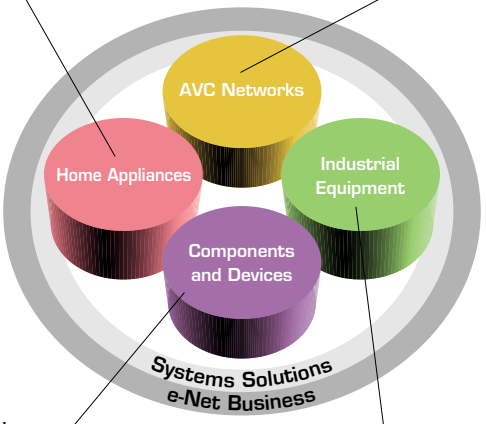
Environmental performance data covers all sites with environmental management systems (see pp.55-56).

Reporting Business Segments ● AVC Networks ● Home Appliances ● Industrial Equipment ● Components and Devices

Business Segments and its Main Products

Home Appliances

Washing machines, clothes dryers, vacuum cleaners, electric irons, microwave ovens, cooking appliances, dishwashers, refrigerators, room air conditioners, electric fans, air purifiers, heating equipment, kitchen fixture systems, electric, gas and kerosene hot water supply equipment, bath and sanitary equipment, healthcare equipment, electric lamps, bicycles, photographic equipment.



AVC Networks

Color TVs, LCD and PDP TVs, videocassette recorders (VCRs), camcorders, DVD players, compact disc (CD), Mini Disc (MD) and SD players, other personal and home audio equipment, AV and computer product devices, prerecorded AV software, broadcast- and business-use AV equipment and systems, PCs, CD-ROM, DVD-ROM/RAM and other optical disk drives, HDDs, other data storage devices, CRT and LCD displays, copiers, printers, telephones, cellular phones, Personal Handyphone System (PHS) terminals and other mobile communications equipment, facsimile equipment, car AVC equipment, traffic-related systems, communications network-related equipment, other information and communications equipment and systems.

Components and Devices

Semiconductors, electronic tubes, LCD panels, PDPs, general components (capacitors, resistors, coils, speakers, power supplies, mechanical components, high frequency components, printed circuit boards, etc.), magnetic recording heads, electric motors, compressors, dry batteries, storage batteries, non-ferrous metals.

Industrial Equipment

Electronic-parts-mounting machines, industrial robots, electronic measuring instruments, welding equipment, power distribution equipment, ventilation and air-conditioning equipment, car air conditioners, vending machines, other food industry-related equipment, medical equipment, elevators, escalators.

Editorial Policy

- The Environmental Sustainability Report is made up of five parts: Environmental Management, Environmental Sustainability, Economic Performance, Social Responsibility, and Third Party Comments. A data section is annexed to provide detailed performance information.
- The report is structured according to the GRI*1 *Sustainability Reporting Guidelines* on *Economic, Environmental, and Social Performance* (published in June 2000). The sections on Environmental Management and Environmental Sustainability conform to the *Environmental Reporting Guidelines* (FY2000 version) issued by Japan's Ministry of the Environment.
- The Economic Performance section introduces new R&D projects and new business activities relating to the environmental field. Financial and accounting information is shown on the Corporate Profile section and on our website.
- Information on the environmental load of each operation site shown in the Site Information (pp.60-68) is a newly added item to the report. Information pertaining to domestic operation sites representative of major division companies and affiliated companies is provided, one site for each company, in this report. Information on other sites will be posted on the website starting in August of 2002.
- This report ensures reliability by complying with the *Environmental Reporting Guidelines*. A Sustainability Analysis of our products was conducted by The Natural Step, an environmental NPO. The results of the analysis are reported in the Third Party Comments section.
- The performance data are from FY 2001. Some of the FY 2002 activities are also included.

*1 Global Reporting Initiative

Detailed Information

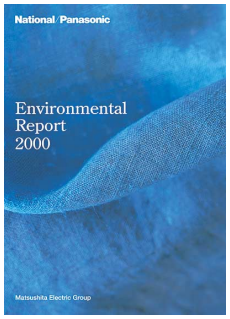
URL mark
Please see the website for further information.

Facts & Figures mark
Please refer to Facts & Figures for detailed performance information.

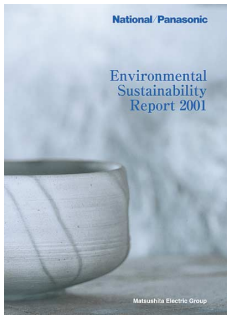
Publication History

Published annually since FY 1997

FY 2000 Edition



FY 2001 Edition



The next publication is scheduled for June 2003.

CONTENTS

TOPICS

Aiming for Coexistence with the Global Environment

It was during my business trip to China in April 2002. As our plane descended toward Beijing Airport, the sight of an ashen gray world outside the window left me awestruck. That day that had seen a massive fall of yellow sand. On the city of Beijing alone, 60,000 tons of yellow sand had fallen during the month of March. That was my first-hand experience of China's desertification.

Desertification is advancing in many areas of the world today. I always wonder why most places that are homes to the ruins of ancient civilizations, such as Egypt and Mesopotamia, have become deserts. The same question intrigued me when I visited Israel. I wondered why the Sinai Peninsula, "a land flowing with milk and honey" in the Old Testament, was now a desert. I learned that although these civilizations first flourished in a land blessed with luxuriant greenery, their rapid growth in population and increased energy consumption depleted the forests and caused ecological unbalance, thereby triggering desertification.

Japan is situated in a subtropical to temperate rainforest region, with most of its land covered by verdant forests. It may therefore be difficult for the Japanese people to fully understand that desertification is a problem faced by mankind throughout history. If we continue our present resource-intensive economic activities, the earth's fossil fuels will be depleted and global warming will impact the entire world ecosystem. From the history of great civilizations, which damaged the natural environment and went into decline after achieving great successes, we learned that coexistence with the global environment is certainly the most important challenge for all mankind. Companies too, must consider it a prerequisite for their survival.

President
Matsushita Electric Industrial Co., Ltd.

Kunio Nakamura

●Two Trends of the 21st Century

I believe that there will be two major social trends in the 21st century. The first is the trend towards a sustainable society. It will bring a halt to global-scale environmental damage and a transition to a recycling-based society with sustainable social and economic growth. The second will be the formation of a society built on "ubiquitous networks" that are made possible by advances in digital and information technologies. These networks will provide connectivity to everyone, everywhere, and all the time. These trends, made possible by enormous technological advancement, will profoundly change our lives and our society. It becomes ever more important for us, the industrial community that handles these sophisticated technologies, to maintain high ethical standards in order to ensure that technologies will not be used for anti-social purposes. I have deep faith that industries can coexist in harmony with the global environment. It is the most critical mission of the industrial community today to do our best to make that coexistence a reality.

●Environmental Vision and Environmental Forum

We formulated the Matsushita Environmental Charter on June 5, 1991 to show its commitment to global environmental conservation. Since then, we have conducted all our business activities with the idea of "coexistence with the global environment" as our first priority. The year 2001, the beginning of a new century, marked the 10th anniversary of our Environmental Charter. In this memorable year, we returned in spirit to the founding of our company to create our Environmental Vision for the "Century of the Environment" and with that vision we drew up the Green Plan 2010, an action plan that brings the next ten years into perspective. In order to communicate the specific approaches and results derived from our Environmental Vision and action plan and to obtain feedback on these efforts, we hosted the Environmental Forum 2001 in Tokyo in October and in Freiburg, Germany, known as the "environmental capital of the world," in December. Before the year 2000, the Environmental Forum was held as an in-house event. We decided to expand it into a public forum covering our environmental activities because we were keenly aware of the importance of exchanging opinions and working with all members of the society to make harmonious coexistence with the global environment a reality. Although our first public forum was a challenge that required courage, I am happy that it was favorably received in both Japan and Europe.

●Efforts in Recycling Electric Home Appliances

In April 2001, Japan took the lead in enforcing the Law for Recycling of Specified Home Appliances to work towards the realization of a recycling-based society. As a result, last year became a challenging one for us as we built a nationwide recycling system in order to establish a manufacturing approach contrary to the conventional one. Although some issues remain to be solved, thanks to the understanding and support of our customers and the all-out efforts of various companies, the collection and recycling of used appliances proved more successful than initially anticipated. In tandem with the enforcement of the above-mentioned Law, we opened the Matsushita Eco Technology Center, an advanced recycling plant located in a science park in Hyogo Prefecture. Based on the concept of "making new products from end-of-life products," the Center processed about 565,000 units of used products (TVs, refrigerators, air conditioners, and washing machines) in FY 2001. The recycled resources were used to make parts such as new CRTs and base frames for washing machines. This recycling plant also houses an R&D department that develops recycling technologies and conducts research into making products easier to recycle. This research is designed to enable employees involved in product development to apply the experience they obtained from the recycling plant to the development and manufacturing of products. Since the Center is a facility open to the public, about 1,000 visitors per month from Japan and foreign countries tour the plant and provide us with valuable comments and suggestions.

●Major Achievements in FY 2001

Based on the concept of a Super Manufacturing Company, Matsushita is presently undergoing a self-reformation in search of a new identity for the manufacturing industry–one that can continue contributing to society in the 21st century. One of the company's greatest missions is to work towards mankind's coexistence with the global environment. In FY 2001, we achieved immense results in the environmental field, for example, demonstrating the operation of a fuel cell powered household cogeneration system (a system providing heat and electricity at the same time) in our Environmental Forum. Thus, we became the first manufacturer to give a public demonstration of such a system, and received high recognition for this achievement. The system will be launched in the marketplace as an environmentally conscious energy source in 2004. We also began a demonstration study to connect electric home appliances with social services providers in preparation for its home energy management business. This system utilizes Echonet, a communications standard that uses the home electrical wiring as a network system. In the field of energy-saving products, both the triple-cooling refrigerator and the power devices for switching power supply were awarded the Minister of Economy, Trade and Industry Prize of the Energy Conservation Award. In the USA, we have received the Energy Star Partner of the Year Award from the Environmental Protection Agency for the fourth year in a row. Furthermore, we succeeded in commercializing a refrigerator using an entirely new product concept that has the potential to reorient future refrigerator development. It is the natural fluid (HC) refrigerator, which neither depletes the ozone layer nor has much global warming effect. The added environmental value of this 21st century refrigerator is the result of our environmental technologies. It has attracted immense interest following its recent introduction into the market.

●Creating a Truly Enriched Life for Everyone

Konosuke Matsushita, the founder of Matsushita Electric, left us with a universal corporate philosophy declaring, "As a public entity entrusted by the society, a business must contribute positively to society through its industrial activity." In the eighty-some years since the founding of our company, we have become a manufacturer with a global operation rooted in over 40 countries and regions around the world. Looking squarely at reality from a global perspective, we find that the condition of the earth today is grim, with forests in many areas of the world rapidly disappearing and many people in the world suffering from malnutrition. Those with little hope might see this as a chaotic era in which the whole world is going down the same path as the lost civilizations of the past. In order to avoid repeating the same mistakes that they made, we must gather all the wisdom in the world to find a solution, though this cannot be achieved by a single company or individual. It is, however, extremely important for every company and every individual to shoulder their own responsibilities and to take action scrupulously.

In order for Matsushita to become a sustainable company, we are taking the initiative in working towards coexistence with the global environment in all aspects of our business operations, working in accordance with the "ET^2!" concept (Environmental Technology & Ecological Thinking) stated in our Environmental Vision. At the same time, we will continue to contribute to the realization of a truly enriched life for all people in the world. To that end, we will devote its utmost efforts to fulfill the goals of the Green Plan 2010.

Finally, taking the opportunity provided by the publication of the Environmental Sustainability Report 2002, I would like to thank you for your interest in our environmental activities and ask for your continued support and understanding of our future endeavors.

Natural fluid (HC) refrigerator now on the market
(the NR-C32EP model)

Basic Policy for the Environment

Environmental Statement

Our corporate mission is “to devote ourselves to the progress and development of society and the well-being of people through our business activities, thereby enhancing the quality of life throughout the world.” Based on the management philosophy stated in the Basic Management Objective, we established the Matsushita Environmental Charter, which includes the Environmental Statement and the Code of Conduct, on June 5, 1991. In accordance with this Charter, operation sites throughout the world set up rules and standards to promote environmental conservation activities.

●The Responsibility of Humankind

The responsibility of humankind advocated in our Environmental Statement finds its origin in the thoughts on humanity expressed by the founder, Konosuke Matsushita. He believed that “humankind is the master of nature,” and for this very reason, humankind has the serious responsibility to make the best use of all things in accordance with the law of nature. This may seem contradictory to the common perception we have in addressing global environmental problems, which views human beings as only part of nature and their existence insignificant, dependent entirely on nature. However, when we look at the state of the earth’s environment today, we cannot help but admit that mankind indeed behaves like the “master” because its mass consumption of resources has caused climate change and disruption of ecosystems on a global scale. On the foundation of Konosuke Matsushita’s thoughts on humanity and our aspiration to be true masters, the Matsushita Environmental Statement represents our commitment to help restore the global environment into a healthy state through our business activities.

Basic Management Objective

Recognizing our responsibilities as industrialists, we will devote ourselves to the progress and development of society and the well being of people through our business activities, thereby enhancing the quality of life throughout the world.

The Basic Management Objective states the purpose and raison dêtre of our company, and serves as the basis of all our business activities. Since its establishment by Founder Konosuke Matsushita in 1929, we have continuously conducted business following this philosophy. Today, amid great transition in the global environment, society, and economy, we continue to base our activity on this management philosophy with the aim of contributing to the development of a sustainable society, thus opening paths to a new era.

Environmental Statement

Fully aware that humankind has a special responsibility to respect and preserve the delicate balance of nature, we at Matsushita acknowledge our obligation to maintain and nurture the ecology of this planet. Accordingly, we pledge ourselves to the prudent, sustainable use of the earth’s resources and the protection of the natural environment while we strive to fulfill our corporate mission of contributing to enhanced prosperity for all.

The Environmental Statement is based on two concepts:
1. The law of nature that genuine progress and prosperity cannot be achieved without co-prosperity of all beings on earth, and 2. The fulfillment of social responsibility based on the awareness that humankind has the obligation to make the most of everything in a caring and fair manner.

Environmental Vision

It provides our basic idea and direction for its environmental contribution to society in the 21st century (formulated in October 2001).

Green Plan 2010

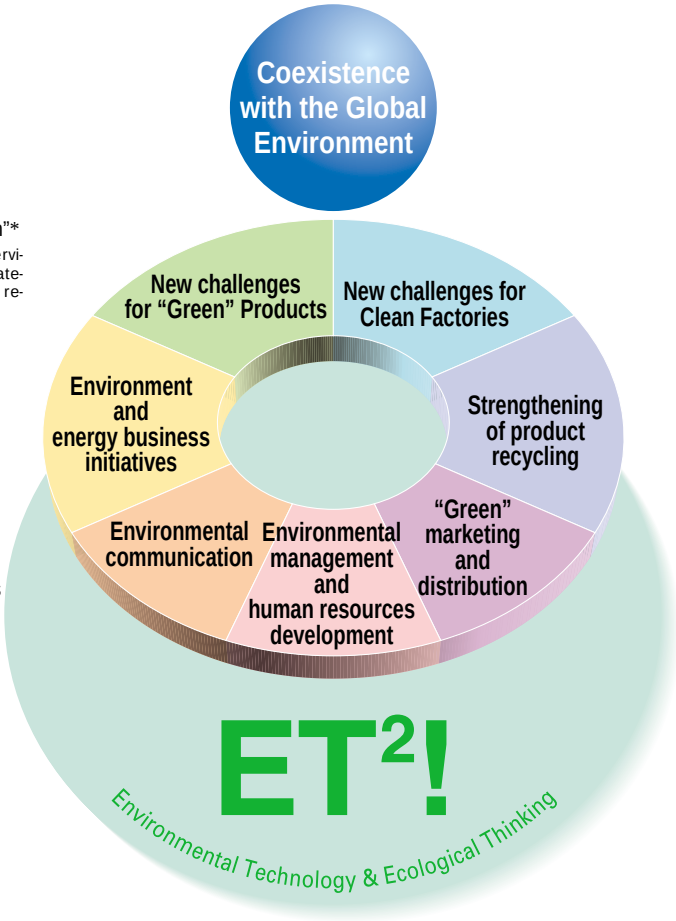
It is a concrete action plan targeting 2010 for the realization of the Environmental Vision. At present, it covers 48 items in seven areas (formulated in October 2001).

Environmental Vision

Environmental Statement

Environmental Vision

Matsushita Electric Group contributes to "Coexistence with the Global Environment" through Environmental Technology and Ecological Thinking (ET²!).



New challenges for "Green" Products

- Make all Matsushita products "Green"*

*Environmentally friendly products and services made with environment-conscious materials through efficient use of energy and resources.

Environment and energy business initiatives

- Make endeavors to develop sustainable energy such as fuel cells

Environmental communication

- Use various means to communicate Matsushita's environmental activities worldwide
- Take up future challenges by collaborating with internal members and external parties

New challenges for Clean Factories

- Strive to achieve Zero Emission*

*Minimize CO_2 emissions and waste generation

- Strive to develop environment-conscious production methods and systems

Strengthening of product recycling

- Expand product categories for recycling

"Green" marketing and distribution

- Make commitment to conserve energy and resources

Environmental management and human resources development

- Establish organizational structure to facilitate speedy and autonomous decision-making procedure
- Establish indicators and evaluation systems for environmental management
- Cultivate environmental awareness in employees

Green Plan 2010

In October 2001, Matsushita formulated the Environmental Vision and Green Plan 2010 after reviewing its existing action plans. These represent our vision to help build a sustainable society and the concrete action plan for taking steady steps toward its realization. As an electronics company, our mission is to keep developing environmental technologies to facilitate human's coexistence with the global environment. What guides this technological endeavor is an ecological thinking stemming from humankind's responsibility to seek coexistence with all things in the universe observing the law of nature. We at Matsushita will devote our utmost efforts to realizing the vision and the action plan in order to honor our pledge to the society.

Target and Performance

Green Plan 2010

(Base year: FY 2000, global targets)

Item		FY 2005 Target	FY 2010 Target
New challenges for Green Products	**Prevention of global warming**	Increase energy use index*1 by 30%	Increase by 50%
	Chemical substances	Discontinue use of lead, cadmium, mercury, hexavalent chromium, brominated and chlorinated flame retardants, and PVC	
	3Rs (Reduce,Reuse,Recycle)	Increase resource use index*2 by 50%	Increase by 70%
	Product development	Increase development of Green Products to more than 70%	More than 90%
New challenges for Clean Factories	**Prevention of global warming**	Reduce CO_2 emissions per unit of production by 5%	Reduce by 10%
		Maintain CO_2 emissions at the same level as FY 1990 (Japan)	Reduce by 7% (Japan)
	Chemical substances	Reduce the amounts of use, release and transfer by 40%	Reduce by 60%
	Waste and by-products with value	Reduce emissions per unit of sales by 10%	Reduce by 20%
	Water	Reduce consumption per unit of sales by 5% Promote effective use of water resources	Reduce by 10%
	Production methods and systems	Establish new production methods and systems to enhance the efficient use of energy and resources	
Strengthening of product recycling		Establish a system to increase the number of products for recycling Improve recycling rate	Establish recycling systems for all household electric appliances
Environment and energy business initiatives		Launch full-fledged marketing campaign for home-use fuel cells cogeneration system Strengthen energy management business	Conduct full marketing campaign for the system Expand the business
Green marketing and distribution	**Conservation of resources**	Conserve resources by making use of the Internet in marketing activities	
	Prevention of global warming	Promote modal shift in distribution	Introduce low-emission vehicles
Environmental communication	**Information disclosure**	Develop the Environment Report into a Sustainability Report Publish site reports Promote communication with a wide range of stakeholders	
	Green investment / contribution to local communities	Continue implementation of forest preservation activities Increase green area of factory sites and roof gardens Promote Green investment Establish Green Fund	
	Corporate citizenship	Expand Love the Earth Citizens' Campaign to outside the company Expand LE families to more than 50% of all employee households	Build an inter-company network for LE activities More than 80%
	Partnership	Strengthen partnership and form networks with environmental NPOs Actively cooperate with and contribute to environmental activities of international organizations, governments, and municipalities	
Environmental management and human resources development	**Organizational structure**	Strengthen the environmental promotion system of Group companies throughout the world Strengthen decision-making functions in each global region	
	Development of human resources	Prepare environmental training curriculums for each corporate level and division	
	Management evaluation system	Establish a comprehensive environmental accounting system Reflect the reductions in environmental impact of products and operations in the evaluation of business results	Reflect environmental accounting system in the evaluation of business results

*1 Energy use index = 1 / (CO_2 emissions throughout entire life cycle / product functions x product life)
*2 Resource use index = 1 / {2 x (mass of resource input throughout entire life cycle – mass of 3R materials – mass of 3R applicable materials) / product functions x product life}

FY 2002 Target

	FY 2002 Target
	Increase energy use index*1 by more than 12%
	Complete the introduction of lead-free solder in all products Investigate the amount of prohibited substance use and consider the use of substitutes
	Increase resource use index*2 by more than 20% Grasp the material balance of major products
	Increase the development of Green Products to more than 28%
	Reduce by 2%
	Retrain to 103% of FY 1990 level (Japan)
	Reduce by 22% overseas and 39% in Japan (compared to FY1998)
	Reduce by 4% Achieve zero emissions of waste (Japan)
	Reduce by 2% Investigate the current status of effective use of water resources
	Investigate the environmental impact of cell production system
	Tackle issues lying in expansion of product categories Enhance activities for reduction and reuse
	Promote environmental business creation conference and energy management business project Hold in-house Environmental Business Forum
	Increase the demand for Green Products through active promotion on the Web
	Develop a system to grasp the environmental impact of transportation
	Promote activities to enhance the credibility of Environmental Sustainability Reports and plan for early publication Hold stakeholder meetings
	Introduce in-house CO_2 emissions trading Expand green purchasing items (e.g. introduction of low-emission vehicles)
	Expand the model activities of Love the Earth Citizens' Campaign Expand LE families to 30,000 households
	Propose energy-saving measures for household emissions to the government in the "Conference for *'Wa-no-kuni'* Lifestyle"
	Strengthen environmental management system to carry out Green Plan 2010
	Prepare and carry out Matsushita's original environmental training curriculums
	Include progress of the Green Plan 2010 in evaluating the achievements of global business divisions

FY 2001 Performance

Green Products (GP): Promoting the Development of GP

Item	Target	Performance	Self-assessment
Energy conservation	Maintain our top-level performance in the industry	Increased the number of products from 3 to 8 in the No. 1 category of the Energy Conservation Performance Catalog*3 (p. 28)	○
Reduction in the use of chemical substances			
Lead-free solder	More than one model in every registered product category	Of the 119 registered product categories, all models used lead-free solder in 83 product categories (70%) and some models used lead-free solder in 26 product categories (22%) (p. 28)	△
Chemical substances	Clarify chemical substances to be abolished	Established targets and announced them in Green Plan 2010 (p. 7) Completed in-house standardization of environmentally conscious AC cord (p. 24)	○
3Rs (Reduce, Reuse, Recycle)	Apply study results obtained from the home appliance recycling plants to the design of new products	Succeeded in using recycled materials for the manufacturing of CRTs, cabinets and back covers of TV, and base frames for washing machines (p. 34)	○
Green procurement	Evaluate material suppliers Implement studies on chemical substances	Completed evaluation of 3,173 suppliers and continued studies on chemical substances (p. 24)	△
Product assessment	Establish criteria for GP	Completed establishment of criteria for GP (p. 27) Made decision to incorporate the results into the evaluation of business performance (from FY 2002) (p. 18)	○

*3 Published by the Energy Conservation Center, Japan

Clean Factory (CF): Promoting Zero Emissions

Item	Target		Performance	Self-assessment
Energy conservation	Formulate and implement a three-year energy conservation plan Control CO_2 emissions to 4% increase (compared to FY 1990 level)		Completed plans at all operation sites Controlled CO_2 emissions to 3% increase in Japan (p. 21)	○
Reduction in the use of chemical substances	Japan	Use of "Reduction" substances: 33% reduction (compared to FY 1998 level)	Achieved 57% reduction	○
		Releases and transfers of "Proper Management" substances: 33% reduction (compared to FY 1998 level)	Achieved 46% reduction	○
	Overseas	Implement the 33/50 Reduction Plan	Began implementation in Asia and Oceania region (p. 22)	△
Waste reduction (including by-products with values)	Establish targets for reduction Achieve 96% recycling rate		Established targets and announced them in Green Plan 2010 (p. 7) Achieved 97% recycling rate (p. 23)	○

Promotion of Love the Earth Citizens' Campaign (LE Activities)

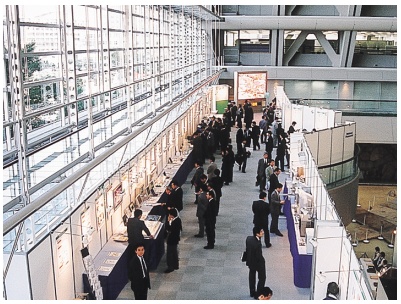
Item	Target	Performance	Self-assessment
Promotion of LE activities	Achieve 50% employee participation in FY 2005 Expand LE activities to outside the company	Participation by 21,000 families (p.45) Hosted the first public symposium and events (p.46)	○

Self-assessment levels:
○ Target accomplished △ More than 80% of targets accomplished
× Less than 80% of targets accomplished

The Green Plan 2010 was formulated in October 2001. Implementation of concrete activities began in April 2002. Consequently, the FY 2001 Performance shows targets as of April 2001 and corresponding results.

Environmental Forum 2001

President Kunio Nakamura announces the Matsushita Electric Group "Environmental Vision" and "Green Plan 2010" (Tokyo)



The exhibition hall – 300 items including about 120 panels and machine demonstrations (Tokyo)

The Mayor of Freiburg, Germany, cuts the ribbon at the opening ceremony (Europe)

Symposiums and seminars inviting eminent lecturers (Tokyo)

Former Minister of the Environment Kawaguchi reviews various displays on recycling technologies (Tokyo)

Household fuel cell cogeneration system and EV-related products attract attention (Europe)

We held the "Environmental Forum 2001" in October 2001 in Tokyo, and in December in Europe. The forum aimed to inform the public of our ideas about environmental activities and our achievements, and also to obtain feedback for use in planning our future activities.

Environmental Forum 2001 in Tokyo

This Forum held at our Multimedia Center (Shinagawa, Tokyo) on October 1-6, 2001 under the theme of "Exploring Sustainable Lifestyles and Community, " attracted about 3,500 visitors. Matsushita President, Kunio Nakamura made a commitment to the world by announcing Matsushita's Environmental Vision, which looks 10 years into the future, and the Green Plan 2010, the Vision's corresponding action plan. The forum was aimed at the gathering and sharing of the various knowledge and technology needed to guide a transition toward a sustainable society. To this end, it offered lectures and symposiums by leaders in the environmental field as well as technical seminars given by our engineers on lead-free solder and fuel cells, two technologies we are developing with particular emphasis.

The exhibition featured many demonstrations on achieving a more environmentally conscious lifestyle. For example, in the exhibition hall, we gave the first public demonstration of a "household fuel cell cogeneration system" that supplies both electricity and hot water. Other demonstrations included a home appliances control system, which operates through a home network that is based on the "Echonet" telecommunication standard and utilizes fuel cell generated electricity. There was also good feedback on the Parts Separator Systems temporarily set up in the exhibition hall that demonstrated the disassembly of discarded products. Many people enjoyed feeling as if they were inside a real recycling plant. Other events included an environmental education symposium for participants from industry, government, and academics, as well as wildlife film shows for the local elementary and junior high school children, and an introduction to the experience of volunteering at the Hitorizawa Citizens' Forest in Yokohama City (see p. 46).

Symposiums and Lectures

"Energy Trends and the Global Environment"
Mr. Katsuya Fukuoka, Chairman of the Foundation for Earth Environment

"Freiburg's Environmental Measures towards a Sustainable City"
Dr. Dieter Woerner, Director of the Environmental Department of the City of Freiburg

"Nurturing Eco-minded Citizens"
Prof. Hisatake Kato, President of Tottori University of Environmental Studies

"Environment, Living beings, and Humans"
Mr. Hiroya Kawanabe, Director General of Lake Biwa Museum

"Eco Design in Electronics"
Dr. Tadatomo Suga, Research Center for Advanced Science & Technology, The University of Tokyo

Global Environmental Forum 2001 in Europe

On December 5 and 6, 2001, the European Forum was held with the theme "Seeking Quality Life through Sustainable Development" in the German city of Freiburg, famous for being an environmental model city, with cooperation from the city itself. About 1200 visitors from local businesses, governments and universities/schools came to the exhibition. Particularly well received were the keynote speech on fuel cells, given by Dr. Hebling of the Fraunhofer Institute for Solar Energy Systems, and the panel discussion that followed. Active discussion followed on fuel cell technology and future energy policy. The full program also included exhibitions, a tour of environment-related facilities in Freiburg, as well as a concert by the EU Baroque Orchestra (see p. 44).

Global Environmental Forum 2001 on the Web

This website gives details of the symposiums and lectures and information on the exhibited panels and exhibition hall

URL **http://www.matsushita.co.jp/corp/vision/en/ecovision/**

Conference on the Creation of *"Wa-no-kuni"* in the 21st Century

In FY 2001, the "Conference on the Creation of *'Wa-no-kuni'* –an Eco-society through Partnership– in the 21st Century" was held with all members of the Japanese Cabinet in attendance. Matsushita Chairman Yoichi Morishita participated in the Conference as a member and proposed the "creation of the environmental model cities." In February 2002, the "Conference on *'Wa-no-kuni'* Lifestyle" was established calling for citizens to reform their lifestyles for a sustainable society, and Matsushita again was a member of the conference.

Conference on the Creation of *"Wa-no-kuni"* in the 21st Century

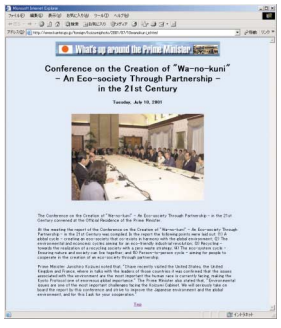
In March 2001, the "Conference on the Creation of *'Wa-no-kuni'* in the 21st Century" that looks 100 years into the future was inaugurated to realize a *'Wa-no-kuni'* Japan that lives in symbiosis with the Earth. One of its major goals is to review basic policies and environmental measures with participation from industry, government, and academia.

The term *"Wa-no-kuni"* is intended to convey the image of a "recycling-based society that emphasizes simplicity, quality and sustainability" rather than a society of "mass production, mass consumerism, and mass disposal" which characterized the 20th century. The Japanese word *"Wa"* has origins in the historical and traditional culture of the Japanese that lived symbiotically with nature but also includes the meaning of cycles: "environmental cycle," and "cycles of a recycling-based society" that effectively uses resources with little or no waste. The word also means harmony: "harmonious relationship" among ecosystems including humans and other living things. Furthermore, it means links: "links" of human cooperative efforts to preserve the environment, and "links" of international cooperation among developed and developing nations to conserve the global environment. The word *"Wa"* carries within itself a hope to create cycles, links, partnerships, and harmony among humanity, civilization and earth.

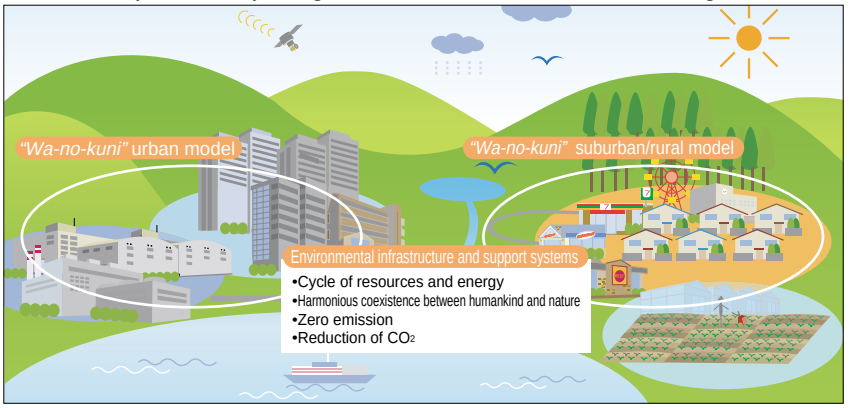
Each member expressed their opinions and held lively discussion on various topics in all five meetings.

Outline of the Conference on the Creation of "Wa-no-kuni" of the Japanese Government

Term: March 1, 2001 – July 10, 2001
(Total of 5 meetings)
Chairman: Prime Minister
Attendees: All Cabinet Ministers and 10 Experts



Creation of the Environmental Model Cities of *"Wa-no-kuni,"* as a Foundation for a Recycling-based Society with the Keys being the Environment and Information Technologies



Proposal for "Creation of an Environmental Model City"

At the third meeting on May 28, 2001, Matsushita Chairman Yoichi Morishita introduced Matsushita's efforts, and illuminated our thoughts on the goal of *"Wa-no-kuni"*, with a concrete proposal.

He proposed the "Creation of an Environmental Model Cities," taking "Cities" to mean the place to live and to foster values and dreams. This proposal is based on the following three ideas: 1) In addressing the environment, an approach should be based on daily life; 2) It is necessary to go beyond the passive concept of being responsible for the protection of the environment, to efforts to inject value and dreams into life; and 3) It is important to create a "100 Year Vision for the 21st Century," and make steady efforts to achieve that vision.

This proposal, in conjunction with "Urban Regeneration," an important issue for the nation, aims to prepare for a recycling-based city. The "Urban Model" should be developed along with the "Suburban/rural Model." For the Model Cities, there will be concrete long-term environmental targets. These include zero waste emissions and CO_2 emissions reduction as well as the realization of a harmonious coexistence between humankind and nature.

For transportation, both urban and suburban/rural areas will employ the most appropriate infrastructure and support systems: the urban model will build a more efficient transport system using IT, and the suburban/rural model will use an on-demand bus system as the optimum transport. For housing, systems will be developed to provide support from both the technology and service aspects, with the "Renewable Energy Housing" using hydrogen as an energy source and Household Energy Management Systems using IT being just a few examples.

The following three concrete initiatives were declared for the realization of this vision.

1. Working out a clear Wa-no-kuni vision for the next 100 years and a direction for the nation
2. Development and implementation of the "Environmental Model Cities" throughout Japan with the keys being the environment and information technologies
3. Construction of a long-term energy supply master plan that includes hydrogen energy

Opening of the "Conference on *'Wa-no-kuni'* Lifestyle" that PromotesReform in Lifestyles

In February of 2002, the "Conference on *Wa-no-kuni* Lifestyle" was established following the "Conference on the Creation of" *Wa-no-kuni'*. Consisting of 16 opinion leaders, the Conference promotes the voluntary participation of the public and seeks ways to further promote effective participation, in order to realize the reformation of lifestyles on all levels in support of the fulfillment of the goals of the Kyoto Protocol. Matsushita Chairman Yoichi Morishita participated as one of the members and expressed his opinion that "We should raise consumers' awareness to carry out wise activities. I, myself, am concerned about wasting energy." The Conference has set up four subcommittees and carried out various activities, including seminars at which opinion leaders lectured.

The First "Conference on *'Wa-no-kuni'* Lifestyle" held on February 16, 2002.

URL Conference on the Creation of *"Wa-no-kuni"* in the 21st Century
http://www.kantei.go.jp/foreign/moritoku_e/2001/03/01wanokuni_e.html

URL Conference on *"Wa-no-kuni"* Lifestyle (Japanese only)
http://www.wanokurashi.ne.jp/

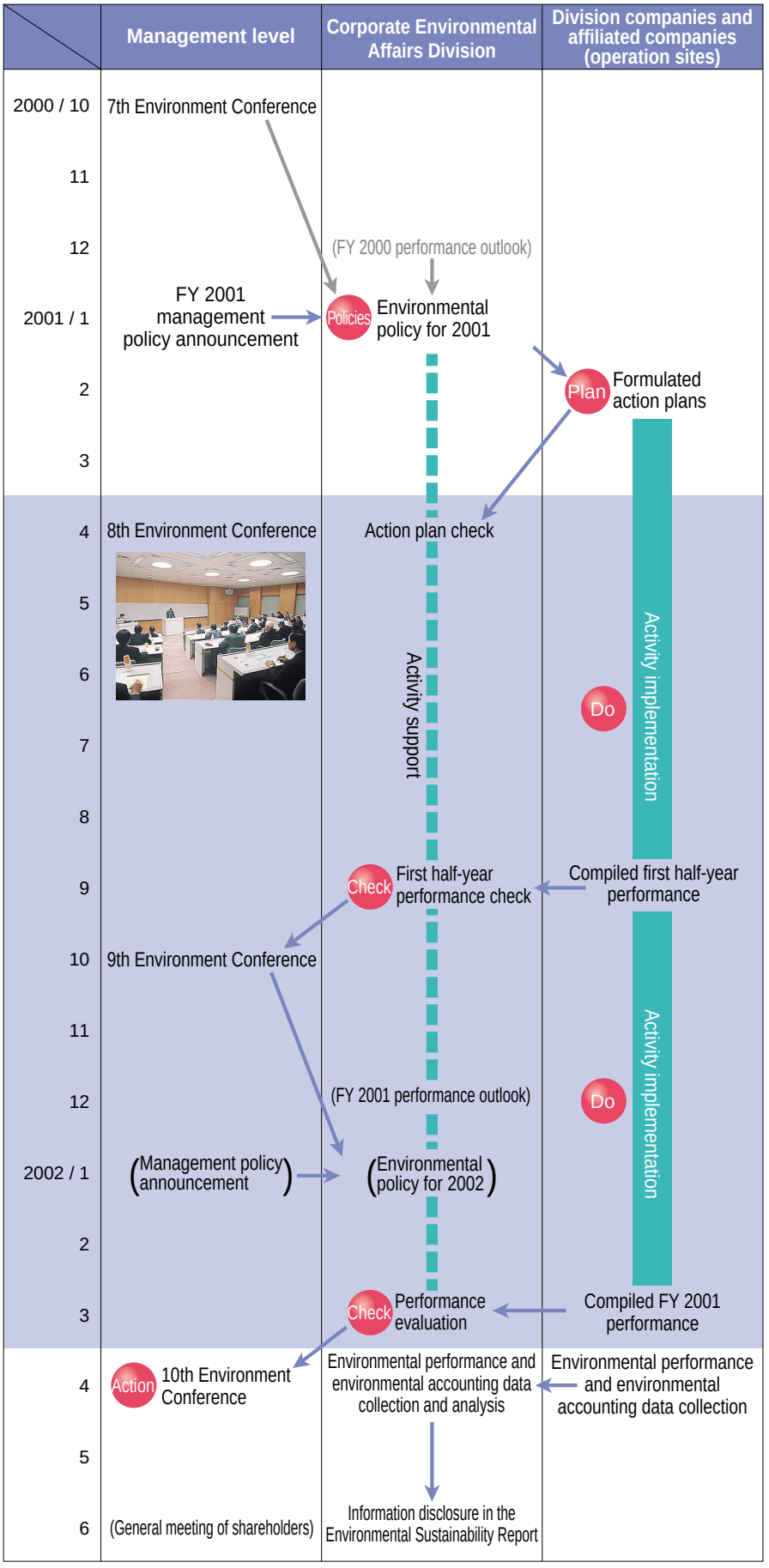
Environmental Management and Promotion System

We are making our best effort to realize the Environmental Vision and Green Plan 2010 with the corporate promotion organization, where Environmental Conference is the top decision-making organ for environmental affairs. The operation is particularly strengthened by committees set up by theme to formulate policies, which manufacturing and functional divisions at division companies and affiliated companies are responsible for the implementation.

Environmental Management Promotion

Based on the Corporate Management Policies announced in January every year, and also on decisions made at the Environment Conference (see p.12), the Corporate Environmental Affairs Division (CEAD) announces the environmental policies to Environmental Officers in charge of the policy implementation at manufacturing and functional divisions. In addition to these officers attending CEAD's policy meeting, in-house satellite broadcasting is used to disseminate information to each operation site, where approximately 1,100 environmental specialist watched in FY 2001. The summary of the policies were also announced to all Matsushita employees through the intranet. Taking into consideration of the businesse nature, division companies and affiliated companies set up their own action plans to turn the policies into activities. The results of these environmental activities are evaluated as part of their business performance on a company-by-company basis (see p.18). Furthermore, worldwide environmental performance data and environmental accounting data are collected, analyzed and disclosed in the Environmental Sustainability Reports.

■Environmental Management in FY 2001



Environmental Management Promotion System

The Environment Conference, chaired by the president of Matsushita Electric Industrial Co., Ltd. (MEI), consists of all the presidents of division companies and affiliated companies which determine Matsushita's most important policies and worldwide activities for environmental management.

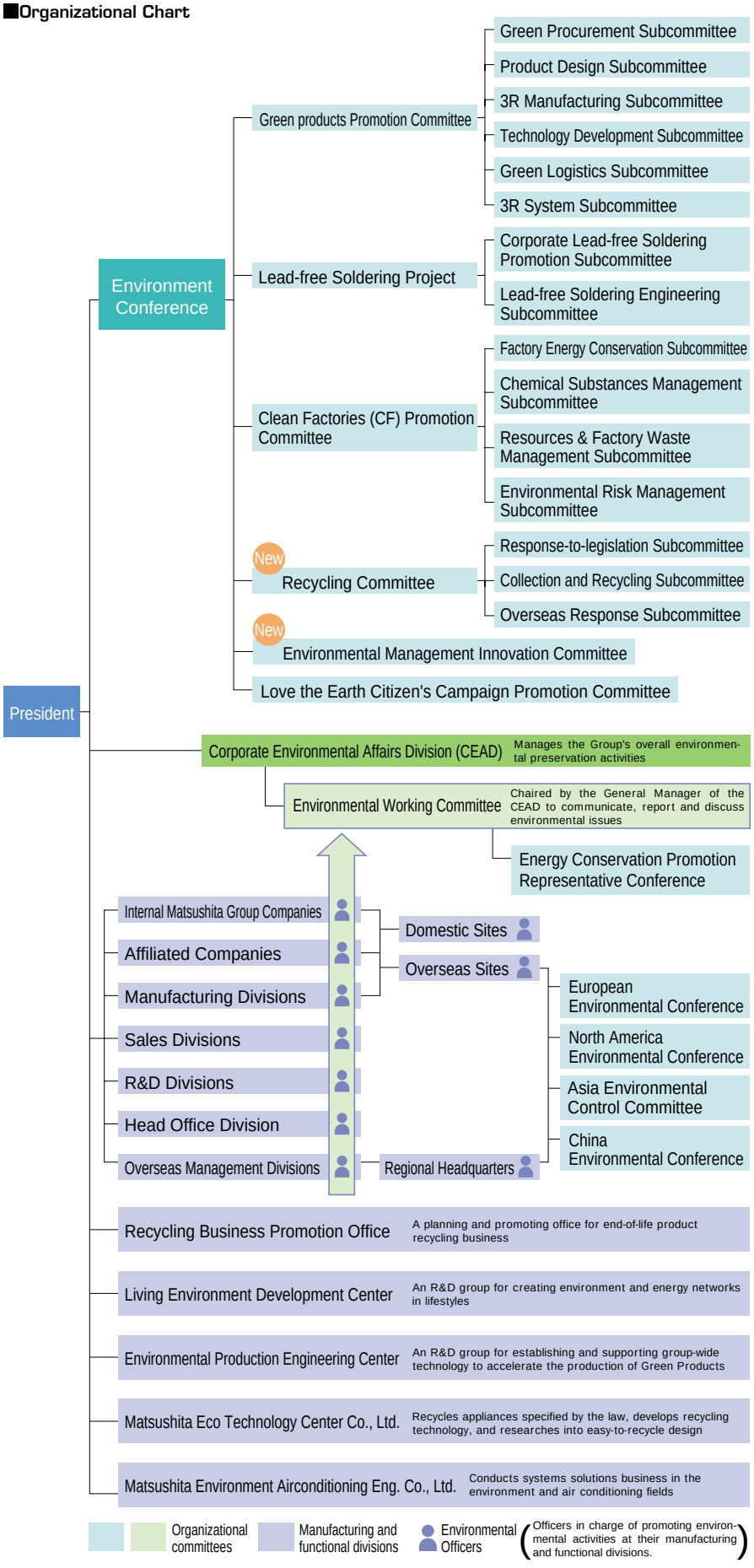
Environment Conference

Function:
Top decision-making organ for environmental affairs
Deliberating and determining environmental policies
Composition:
Chairman: President of MEI
Members: Presidents of division companies and affiliated companies
Executive directors and directors of related functional divisions
(Total: 38 members)
Secretariat: Corporate Environmental Affairs Division
Meetings:
Biannually, in first half and second half of the year
10 meetings held since 1997

The Environmental Vision and Green Plan 2010 were decided upon during the 9th Environment Conference held in the second half of FY 2001. Committees and projects were set up by theme to tackle important issues. Subcommittees comprised of members from related functional divisions, major division companies and affiliated companies were set up to plan and carry out their mission. In FY 2001, two new committees were established. One is the Recycling Committee, which deals with the extended producer responsibility to recycle end-of-life products. The other is the Environmental Management Innovation Committee, which constructs an environmental information system to support effective environmental management.

CEAD manages the entirety of the Group's environmental activities. It is responsible for drafting environmental strategies, supporting their implementation, and reviewing their performance. All the matters and policies decided at the Environment Conference for the year's activities are confirmed to division companies and affiliated companies throughout the world in the form of Environmental Notices issued by the Director of CEAD. Environmental Officers are appointed by the presidents of their division companies and affiliated companies or by the head of functional divisions to promote concrete activities at their respective workplaces.

Organizational Chart



Environmental Management Systems

Our drive to establish environmental management systems has culminated in the acquisition of ISO14001 certification by all our manufacturing sites worldwide and was completed by the end of FY 1998.

It is vital that employees have full awareness of global environment issues and how manufacturing impacts environment, in order to make continuous efforts toward improvement. To this end, we offer a wide variety of education and development programs for employees.

Acquisition of ISO14001 Certification

In November 1995, the Kadoma Site of AVC Company became the first to obtain ISO14001 certification. In FY 1996, Matsushita adopted a policy of pursuing ISO14001 certification company-wide. Accordingly, all of our manufacturing sites worldwide had obtained certification by the end of FY 1998. We are currently pursuing certification acquisition by non-manufacturing sites as well. In the case of newly opened manufacturing sites, we set a goal of obtaining certification for these facilities within three years.

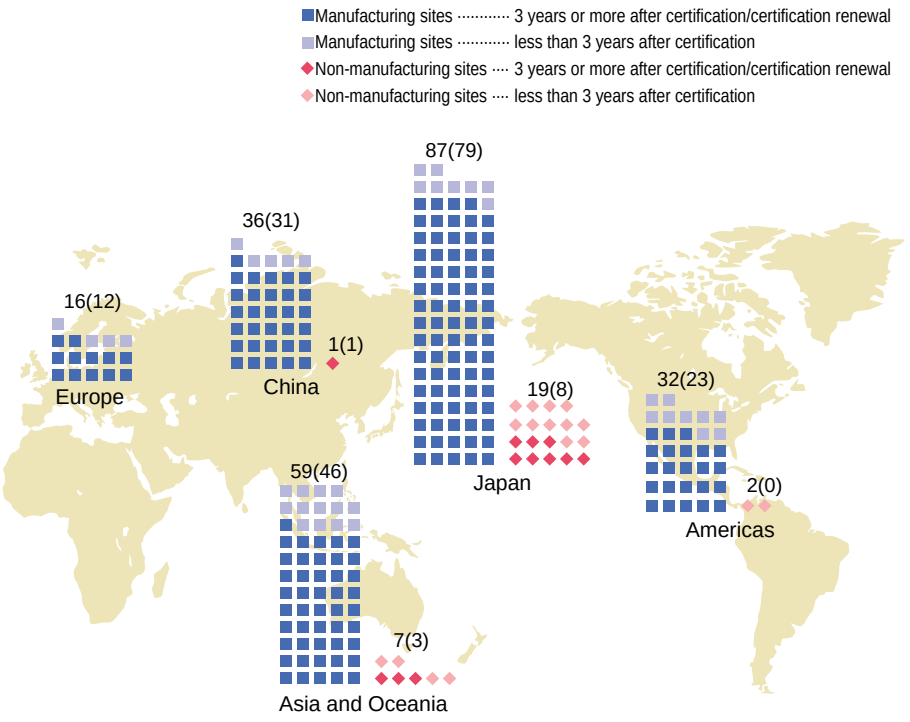
Of our manufacturing sites, 83 percent have already completed certification renewal, a process conducted every three years. This provides an indication that environmental management systems gain a significant foothold. The number of ISO14001-certified sites increased, adding 15 sites of Victor Company of Japan, Ltd. in FY 2000. Business restructuring, which involved consolidation of sites, and an increase in joint certification acquisitions by two or more sites during FY 2001 brought the number of certified sites to 259 as of March 2002.

Acquisition of ISO14001 Certification

FY	Number of certified sites
End of FY 1999	245
End of FY 2000	280
End of FY 2001	259

DATA ISO14001 Certification Status ➡ P.55–56

Number of ISO 14001-certified Sites by Region



Figures in parentheses denote the number of sites for which the certification has been renewed.

Environmental Audits

To verify the effectiveness of environmental management systems and the results of environmental performance, we annually conduct internal audits as well as external audits by independent auditing firms. We have created a common internal audit check sheet for use by the entire Matsushita Group, with the aim of upgrading the systems at each operation site and promoting the sharing of expertise. Based on environmental performance data (an achievements report) collected from the operation sites at year-end, we compile quantitative data, which help us identify problems, and formulate policies and measures accordingly.

An Internal Auditing Check Sheet Shared Group-wide

Compliance with Laws and Regulations

We obtain information on newly enforced laws and regulations from our regional headquarters and reliable news sources around the world and share them throughout the Group. Based on ISO14001, each site compiles applicable laws and regulations, taking into account the type of its operation and located regions. For daily business operations, the sites establish voluntary standards that are more stringent than those required by laws. In Japan during FY 2001, we had one case of wastewater standard violation and 12 cases of noise violation. In all cases, remedial measures have been implemented. Levels of exhaust gases, odors and vibrations were within standards. There were no accidents or fines paid.

Environmental Education and Awareness-Raising

At Matsushita, we offer two types of environmental education programs for employees: position-specific training aimed to help employees acquire the knowledge of the company's environmental philosophy and policies needed to carry out their job; and function training that help promote specific environmental activities corresponding to employees' function. In addition, each operation site conducts general and professional as well as emergency training, in accordance with ISO14001 requirements.

■Environmental Education System

Group-wide

Position	
New employees	Introductory education (environmental training)
Promoted employees	Training for supervising staff(environmental training)
Managers in overseas	Pre-assignment training (environmental training)
Function	
Environmental auditors	Seminars for internal auditors and managerial internal auditors
Technical specialists	Lead-free Soldering Techno-school
	Recyclable design training
	Highly recyclable products

Offered by individual sites

All employees	General education
Specified workers	Professional and emergency training

●Training for Environmental Auditors

We periodically conduct in-house environmental auditing seminars designed to help employees deepen their understanding of environmental management systems as well as to train environmental auditors. In addition to this course, we host seminars targeted primarily at non-manufacturing sites currently pursuing ISO14001 certification, opening the classes to our major domestic business partners as well, with the aim of upgrading our environmental activities.

■Number of Participants at Environmental Auditor Training Seminars (unit: number of people)

	FY 2000	FY 2001
Internal auditors seminars	434	414
Managerial internal auditors seminars	66	52
Total	500	466

■Number of Seminar Attendees from Major Business Partners (unit: number of people)

	FY 2000	FY 2001
Internal auditors seminars	96	55

●Lead-free Soldering Techno-School

Toward the goal of abolishing the use of lead solders on a global scale by the end of FY 2002, "Lead-free Soldering Techno-school" was launched for employees working in the production technology, design, product quality, environment and material divisions with the support of Environmental Production Engineering Laboratory. With two locations in Japan and one in Singapore equipped with demonstration facilities, the school offers a curriculum that consists of two courses – the basic to practical application course and the selective technical support course to meet specific needs. In consideration of the fact that we use externally supplied printed circuit boards using soldering, we offer these training courses to our major domestic business partners.

■An Outline of Lead-free Soldering Techno-school

Curriculum

Course	Number of days	Description
Basic-to-practical-application course	3days	Seminar, Training, Demonstration using specific cases
Technical support course	1day	Demonstration
	Special support (Technical consultation, Use of facilities, etc.)	

Techno-schools Opened

Location	Opened in	Number of participants	Primary target
Osaka (Kadoma)	June 2000	246 people from 65 operation sites	Western Japan
Kanagawa (Fujisawa)	December 2001	27 people from 5 operation sites	Eastern Japan
Singapore	April 2001	55 people from 16 companies	Overseas


Hands-on training (left) and quality inspection (right) at Techno-school

●Emergency Training

Each site is identifying procedures that may have significant impact on the environment.


Training to prevent oil spills during fuel oil receiving (left) and training to prevent chemicals from flowing into rainwater ditches during receiving (right) at the Lighting Company.

●Awareness-Raising Activities

As part of an educational program among employees to promote environmental management, we issue Environmental Notices during Environment Month (June), Recycling Month (October) and Energy Saving Month (February). Matsushita's division companies and affiliated companies implement their own education programs that take into consideration the nature of their business as well as regional characteristics.

■Education Activities by Matsushita Division Companies and Affiliated Companies

AVC Company (Environment Month)

Environmental exhibition

Display of panels showcasing environmental efforts at its operation sites

Environmental seminar

A lecturer was invited from Toyota Motor Corp.

Lighting Company (Environment Month)

Engineers conducted training in recyclable design.

Held at the Matsushita Eco Technology Center

LCD Group, Display Devices Company (Energy Saving Month)

An appeal through *Environmental News*.

The energy consumption status was reported and actions were called for.

Matsushita Communication Industrial Co., Ltd. (Environment Month)

Environmental Convention

Hosting of the Global Conference

Environmental Exhibition

Display of panels showcasing environmental efforts at its operation sites

●Employee Suggestion Activities

To realize "participative management with collective wisdom," we have been promoting suggestion activities of employees since 1950. On the environmental conservation front, we designate Environmental Suggestion Promotion Months (every June, October and February) to support the effort. We receive some 40,000 suggestions (about 3% of a total of 1.37 million suggestions received annually), which have concerned energy conservation, resource conservation and recycling methods in production processes and other solutions to environment-related problems frequently encountered in daily operations. We post outstanding suggestions on Matsushita's intranet to ensure that employee knowledge is shared by all.

■Outstanding suggestions (FY 2000)

- Improvement to toilet cleaning methods utilizing microorganisms
- Waste reduction through improvement in the quality of lead-free soldering process
- Utilization of exhaust heat from a drying furnace for cathode ray tubes
- Reuse of packaging materials for solder-free jointing equipment

Environmental Accounting

Environmental accounting was introduced in FY 1998 for better understanding of environmental management. Through active disclosure of environmental accounting, we aim at achieving transparency in business management. Matsushita's environmental accounting follows the *Environmental Accounting Guidelines* (2002) announced by the Ministry of the Environment of Japan, and is calculated on a global scale including overseas operation sites. We will grasp the environmental conservation costs and environmental benefits during the entire product lifecycle more accurately, thus promoting efficient environmental management.

Environmental Accounting in FY 2001

For better understanding of the In-house Economic Benefits, the effect of capital investment is shown for each year and three-year accumulations. To understand environmental conservation costs and environmental benefits for the entire product lifecycle, calculations for three major electric home appliances having large electricity consumption (air conditioners, refrigerators, and TVs) are shown as Customer Economic Benefits. Furthermore, for Environmental Conservation Benefits, we attempted to estimate in monetary terms the effects of reduction of CO_2 emissions during business activities and product use.

Scope of Environmental Accounting

Accounting period: April 2001 – March 2002

Target companies:

Domestic operation sites (149) and overseas companies (158) of Matsushita Electric Industrial Co., Ltd. and its 10 major affiliated companies

Major affiliated companies:

- Matsushita Communication Industrial Co., Ltd.
- Matsushita Electronic Components Co., Ltd.
- Matsushita Industrial Equipment Co., Ltd.
- Matsushita Battery Industrial Co., Ltd.
- Matsushita Refrigeration Company
- Kyushu Matsushita Electric Co., Ltd.
- Matsushita Seiko Co., Ltd.
- Matsushita Graphic Communication Systems, Inc.
- Matsushita Kotobuki Electronics Industries, Ltd.
- Victor Company of Japan, Ltd.

Environmental Accounting covers the same scope as the environmental performance data.

Environmental Conservation Costs and Environmental Benefits

(Environmental Conservation Benefits and In-house Economic Benefits)

Environmental Conservation Costs

Capital Investments and Expenses for Environmental Activities (unit: million yen)

Category		Capital investments	Expenses	Total	Major areas addressed
Cost within business areas	Pollution prevention	3,228	5,496	8,724	• Prevention of air, water, and soil pollution, noise, vibration, offensive odor, land subsidence (pp. 13, 35-36)
	Conservation of the global environment	6,255	1,746	8,001	• Prevention of global warming and energy conservation measures • Protection of the ozone layer (pp. 21-22)
	Resource recycling	1,735	6,086	7,821	• Reduction, recycling and appropriate treatment of wastes • Reduction of water use (use of rainwater and wastewater) (p. 23)
	Subtotal	11,218	13,328	24,546	
Upstream/downstream cost		973	1,776	2,749	• Collection, recycling, and proper treatment of end-of-life products • Commissioning the recycling of end-of-life products to external organizations (pp. 33-34)
Management activities cost		19	8,300	8,319	• Development and operation of an environmental management system (p. 13) • Disclosure of environmental information (publishing Environmental Sustainability Reports, organizing environmental exhibitions, etc.) and environmental advertising (pp. 9, 51-52) • Environmental education and training of employees (p. 14)
R&D cost	Technology development	5,702	12,065	17,767	• Development of elemental technology with environmental consideration as the primary objective and introduction of facilities for its production (pp. 27-29, 37-40)
	Packaging /distribution development	86	295	381	• Development and introduction of environmentally conscious packaging (p. 29) • Research and development dedicated to reducing environmental load in distribution (p. 32)
	Subtotal	5,788	12,360	18,148	
Social activities cost		0	40	40	• Donation to and support of environmental activities conducted by environmental conservation organizations and local residents (pp. 43-46)
Environmental damage cost		202	603	805	• Investigation and measures addressing past contamination (groundwater, soil, etc.) (pp. 35-36)
Total		18,200	36,407	54,607	

Notes:

- Expenses include labor cost but not depreciation of capital investment.
- Whenever the amounts of capital investment and labor costs cannot be counted as entirely an environmental conservation cost, differences or appropriate portions (divided proportionally) have been calculated.
- R&D costs are limited to investment and expenses for technology development with environmental consideration as the primary objective, and do not include cost of product development utilizing such technology.
- In accordance with the *Environmental Accounting Guidelines* (2002), "Disclosure of Environmental Information" has been moved from social activities cost to management activities cost, resulting in approximately 1.5 billion yen decrease in social activities cost compared to the previous year.

Analysis of FY 2001 Results

In FY2001, Environmental conservation costs totaled 18.2 billion yen for capital investment and 36.4 billion yen for expenses, making a combined total of 54.6 billion yen. (Total figures in FY 2000 were 62.2 billion yen). In-house economic benefits (aggregate of three years) were : savings of 5.4 billion yen in energy expenses, 3.7 billion yen in waste treatment expenses, and 2.7 billion yen in packaging materials and distribution expenses, plus a 2.9 billion yen profit on sale of by-products with values related to recycling of waste and end-of-life products, amounting to a total of 14.9 billion yen.

While the amount of overall capital investment decreased by 6.4 billion yen compared to FY 2000, capital investment for R&D increased by 3.4 billion yen. The main factors for this increase were: investment in devices mounting equipment for lead-free solder (see p.28), manufacturing facilities for magnesium alloy components (see p.40), and manufacturing facilities for "MK-MWood,"(see p.40) a synthetic wood made from in-house waste plastics and waste wood from sawmills.

In FY 2001, environment-related capital investment accounted for 5.9% (4.9% in FY 2000) of our total capital investment (309.1 billion yen).

Of the total R&D costs (565.5 billion yen), environment-related R&D costs accounted for 3.2% (2.7% in FY 2000).

Environmental Conservation Benefits

Improvement in environmental performance (in physical quantity) compared with the previous year, based on direct environmental loads in business activities and indirect environmental loads during product use.

Category		Reduced amount	Reference
Environmental conservation benefits in business activities	Energy use CO_2 emissions	43,589kℓ 27,757tons-CO_2	P.21–22
	Controlled chemical substances Amount used Releases and transfers	40,946tons ▲537tons	P.22
	Hazardous air pollutant emissions (Japan)	1.3tons	P.36
	Industrial waste Volume generated Volume of final disposal	▲11,012tons ▲5,355tons	P.23
	Water use	957,460m^3	P.23
Environmental conservation benefits during product use (Japan)	CO_2 emissions*1	465,645tons-CO_2	P.27–29
	Packaging materials use Corrugated cardboard Expanded polystyrene	8,676tons 373tons	P.29

Notes:

*1 Estimated figures for three major home appliances with large electricity consumption (air conditioners, refrigerators, TVs)(Lifetime CO_2 emission of FY 2000 models during use – lifetime CO_2 emission of FY 2001 models during use) x number of units sold in FY 2001 in Japan

In-house Economic Benefits

This is "economic benefits as a by-product of environmental conservation measures." Cost savings and gains verified by firm evidence, obtained as a result of promoting environmental conservation measures (unit: million yen)

Category		Single year	Three-year aggregate
Cost savings	Energy conservation at operation sites	2,656	5,410
	Reduction of waste treatment expenses	571	3,734
	Reduction of water and sewage cost	115	166
	Reduction of packaging materials and distribution expenses	1,744	2,705
Gains	Profit on sale of valuable by-products resulting from recycling waste from operation sites	2,458(Single year)	
	Profit on sale of by-products with values resulting from recycling end-of-life products	431(Single year)	
Total		7,975	14,904

Notes:

- Presumed benefits attributable to avoidance of potential risks and enhanced corporate image are not included in the figure.
- Three-year aggregates include aggregate effects of capital investment made in FY 2001 and the past two years.

As for environmental conservation benefits in business activities, while the amount of energy and water used at operation sites decreased compared to FY 2000, industrial waste increased mainly due to the participation of Victor Company of Japan as group companies and the transfer of production sites to overseas, where lacks local recycling infrastructure. Continued efforts will be exerted to reduce waste and establish the necessary infrastructure.

According to a calculation of environmental conservation benefits realized during product use for three major home appliances (air conditioners, refrigerators and TVs), CO_2 emission was reduced by 470,000 tons-CO_2 as a result of reduced electricity consumption.

The CO_2 emissions were converted into monetary terms for reference using the monetary conversion coefficient, resulting in the benefits equivalent to 0.26 billion yen in business activities and 4.4 billion yen during product use, a total of 4.65 billion yen. Similarly, customer economic benefits (reduced electricity consumption during product use) for the three major home appliances resulted in a reduction of annual electricity consumption by 1.3 billion kWh, amounting to 30 billion yen savings in electricity costs.

Monetary Conversion of Environmental Conservation Benefits and Customer Economic Benefits

Monetary conversion of environmental conservation benefits

Monetary conversion of environmental conservation benefits to indicate improvement in environmental performance (physical quantities) (for reference)

	262 million yen
	4,388 million yen
Total	4,650 million yen

Note:

- Monetary conversion coefficient of CO_2 : 9,425 yen/ton– CO_2

Source: Calculation is based on 34,560 yen/ton-C, the maximum cost for reducing CO_2 in Japan for attaining the targets of the Kyoto Protocol as calculated by the Ministry of the Environment (carbon tax calculation).

Customer Economic Benefits

Economic benefits to customers, calculated in terms of reduction in electricity costs during product use, a result of improved energy efficiency of products.

Savings in electricity costs during product use (Japan)	
Savings in electricity*2	1,304,330,000 kWh
Savings in electricity costs	30 billion yen

Notes:

- Estimated figures of three major home appliances with large electricity consumption (air conditioners, refrigerators, TVs)
- Monetary conversion coefficient of electricity costs 23 yen/kWh

Source: EDMC Handbook of Energy and Economic Statistics in Japan 2001

*2 (lifetime electricity consumption of FY 2000 models – lifetime electricity consumption of FY 2001 models) x number of units sold in FY 2001 in Japan

Future Direction

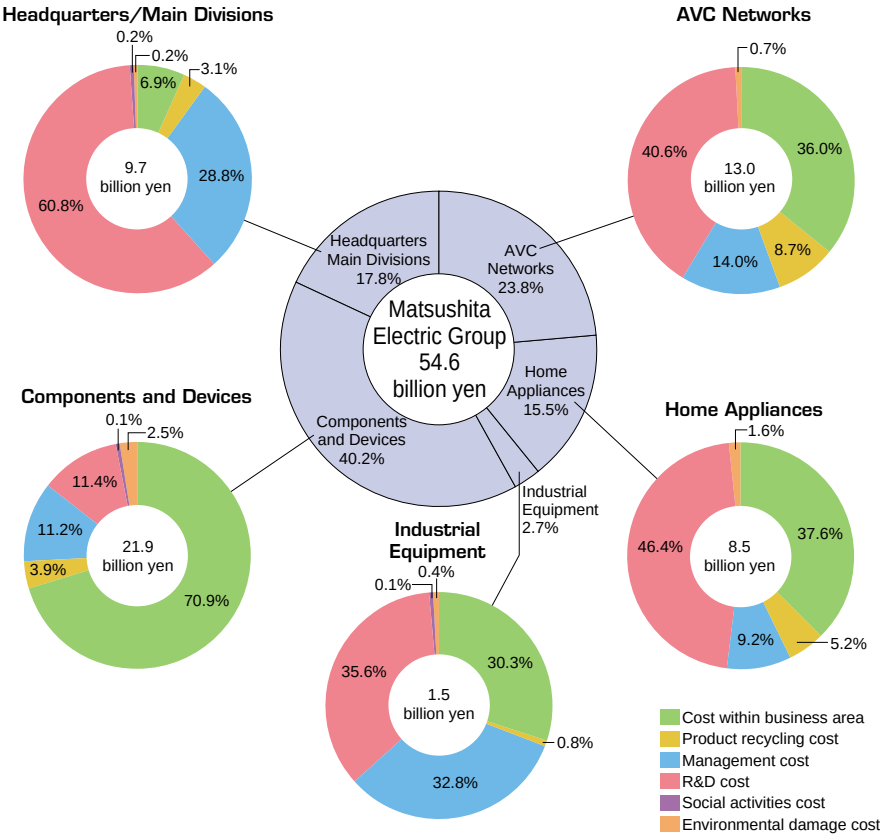
Current environmental accounting is targeted on costs and benefits occurring in the business activities. However, in order for environmental accounting to be an effective tool to promote environmental management, it must cover the entire lifecycle of products. In each step of a product's lifecycle, from manufacturing of materials, to product disposal, energy conservation, chemical substance management, and resource conservation must be sought for. Focusing on these three environmental goals, we will strive to establish indicators that help us understand the environmental conservation costs and benefits more precisely, and properly evaluate environmental benefits. We will also carry out environmental accounting for individual products.

Environmental Conservation Costs by Business Segments

The ratio of environmental conservation costs to the sales in the device segment, mainly consisting of semiconductor and component businesses, was approximately four times that of business segments consisting of assembly for finished goods. Of the environmental conservation costs for the device segment, the costs within business areas accounted for 71%. As the device business consumes a great deal of energy, most of the expenditure was directed toward energy conservation and other measures against global warming, with successful results in CO_2 emissions reduction.

In the AVC network segment, environment-related R&D cost accounted for 41% of the total, due to capital investment in new environmental solutions, such as the magnesium alloy business carried out in FY 2001. In the appliance segment, 46% of expenditures was spent on R&D, such as development of technology for energy conservation during product use.

Breakdown of Environmental Costs by Business Segment (Fiscal year 2001)



TOPICS

Application of Environmental Accounting in R&D

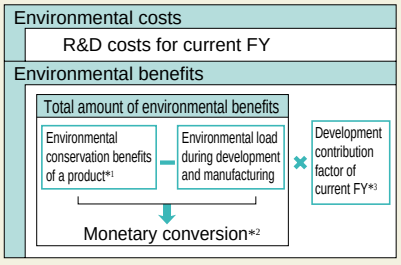
In our Research and Development (R&D) divisions, a variety of environment-related technology development aimed at creating Green Products is underway. However, because a long time is required for such efforts to be applied to products and to yield environmental conservation benefits, it is extremely difficult to evaluate the extent of environmental contribution made by each R&D theme. Thus, based on the concept of environmental accounting, we developed a calculation method for estimating the environmental benefits corresponding to R&D costs, now termed environmental costs, and made trial calculations based on actual R&D themes.

With this method, environmental load during product development and manufacturing is subtracted from predicted environmental conservation benefits within a specified period after its commercialization, and the result is converted into monetary terms to obtain the total amount of environmental benefits. This is then multiplied by the development contribution factor of the current FY, which is the percentage of the current FY's portion to the total amount of development costs, to obtain the current FY's environmental benefits.

We then ran a trial calculation of FY 2001 environmental accounting using this method for some of the current R&D themes aimed primarily at environmental contribution, and found that in any of the themes, environmental benefits exceeded their environmental costs. The total environmental benefits of all four themes reached roughly 3.3 billion yen, against their environmental costs of 1.7 billion yen.

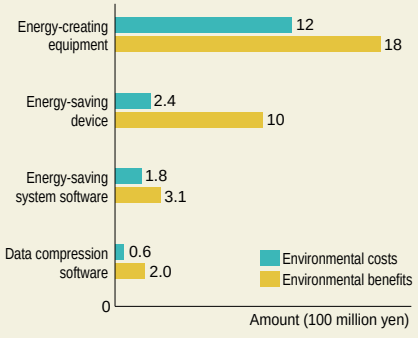
In the future, we plan to refine this calculation method for more precise evaluation of environmental contribution by each R&D theme, and by using these methods regularly aim at more efficient development of environmental technologies.

Calculation Method of Environmental Costs and Benefits for the Current FY



*1 Predicted value within a specified period
*2 Reduction of CO_2 emissions converted using trial calculations of carbon tax
*3 Percentage of FY 2001 portion to the total development cost

A Trial Calculation of FY 2001 Environmental Accounting of R&D Themes



Performance Evaluation of Environmental Management

The Business Performance Evaluation System is a system for yearly evaluation of management activities and achievements by each division company and affiliated company from the perspective of improvement of corporate value and customer satisfaction. The results are reflected in the evaluation of employees' performance belonging to their respective divisions.

Starting in FY 2001, performance evaluation of environmental management has been incorporated into this system, weighted as 10% of the total evaluation. We expect that this will further accelerate the implementation of environmental management at all our operation sites.

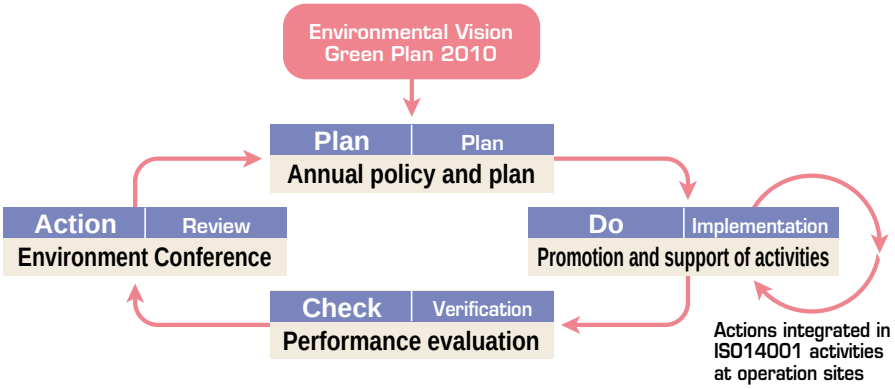
Concept of Performance Evaluation of Environmental Management

Environmental management evaluation, constituting 10% of the entire performance evaluation, consists of "greenness of products"(evaluation of performance in product development) and a "clean factory rating" (evaluation of performance in production activities). Their respective percentages are determined according to the business characteristics of each division. Integration of this performance evaluation practice in the PDCA (Plan, Do, Check, Action) cycle of the environmental management system at each operation site is expected to lead to more efficient operation of the system and continuous efforts for improvement.

●Achievements in FY 2001

The performance evaluation of environmental management, introduced in FY 2001, was carried out at domestic operation sites of our division companies and affiliated companies for the first time in March 2002. This has resulted in such achievements as accelerated introduction of lead-free solder, promotion of energy-saving products, and attainment of targeted recycling rate of wastes in production activities.

■Performance Evaluation: How It Works in the Overall Environmental Management



■FY 2002 Business Performance Evaluation

Evaluation items: Improvement of corporate value; Environmental management; Customer satisfaction

Evaluation criteria

Greenness of products

	Indicator	Criteria
Super GP	Development of Super GP (Super GP refers to sustainability-oriented product, p. 27)	One model
	or	
Green Products (GP)	GP development rate = Sales of developed green products / Sales of all developed products (GP refers to products for improving environmental efficiency and products for solving environmental problems, p. 27)	28%

Clean factory rating

Category	Indicators	Criteria
Energy (p.21)	Energy-saving rate = Amount of energy-saving / Total energy use in FY 2001 (evaluated by CO_2 emissions)	Device segments 7.0%; Other business segments 3.5%
Chemical substances (p.22)	Use of "reduction" ranked substances; Releases and transfers of "Proper Management" ranked substances (Classified according to the Chemical Substances Management Rank Guidelines, compared with FY 1998)	39% reduction; 39% reduction
Waste (p.23)	Recycling rate = Amount of recycled resources / Amount of recycled resources + Amount of final disposal	98%

●Concept of FY 2002 Business Performance Evaluation

Evaluation criteria for FY 2002 environmental management are set in coordination with the Green Plan 2010 (see p.7) for its promotion. Specifically, the greenness of products will be evaluated by the GP development rate or development of Super GP. The clean factory rating will be evaluated by the attainment rates of the three zero emission targets – energy, chemical substances, and waste. But for the evaluation of energy, business nature will be taken into consideration. Overseas manufacturing sites will also be included in the evaluation for global achievement of the goals.

Product Lifecycle and Environmental Load

Matsushita operates a business utilizing many of the earth's resources for parts and materials for its products, as well as energy and water during the production process. We realize the importance of correctly understanding the entire environmental load of our business activities, from the material procurement to the collection and recycling of end-of-life products. For this year's report, we used some product lifecycle models to identify these environmental effects and calculate the amount of environmental load. We will strive to improve accuracy in order to efficiently reduce the environmental load at each step of the product lifecycle.

Calculation Model

Targeted region: Japan

Manufacturing (Input items)

Electricity: Amount of electricity purchased from electric utilities
Oil: Use of fuel oil and kerosene
Gas: Use of city gas and LPG
Water: Amounts of municipal water, industrial water, and groundwater used
Resources: Amounts of each material used for the seven major product items,*1 weight of packaging materials, and amounts of chemical substances used

Manufacturing (Output items)

CO_2: Emissions of carbon dioxide associated with the use of electricity, gas, oil, etc.
NOx: Emissions of nitrogen oxides resulting from the use of gas and oil
SOx: Emissions of sulfur oxides resulting from the use of oil
Chemical substances: Releases and transfers of chemical substances into the air and water
Effluent: Amount of effluent discharged into the sewage system
Waste: Amount of waste generated and amount of final disposal

Distribution

- Targeting domestic transportation from manufacturing divisions to retailers
- For products imported from overseas manufacturing companies, targeting domestic transportation after their arrival in Japan

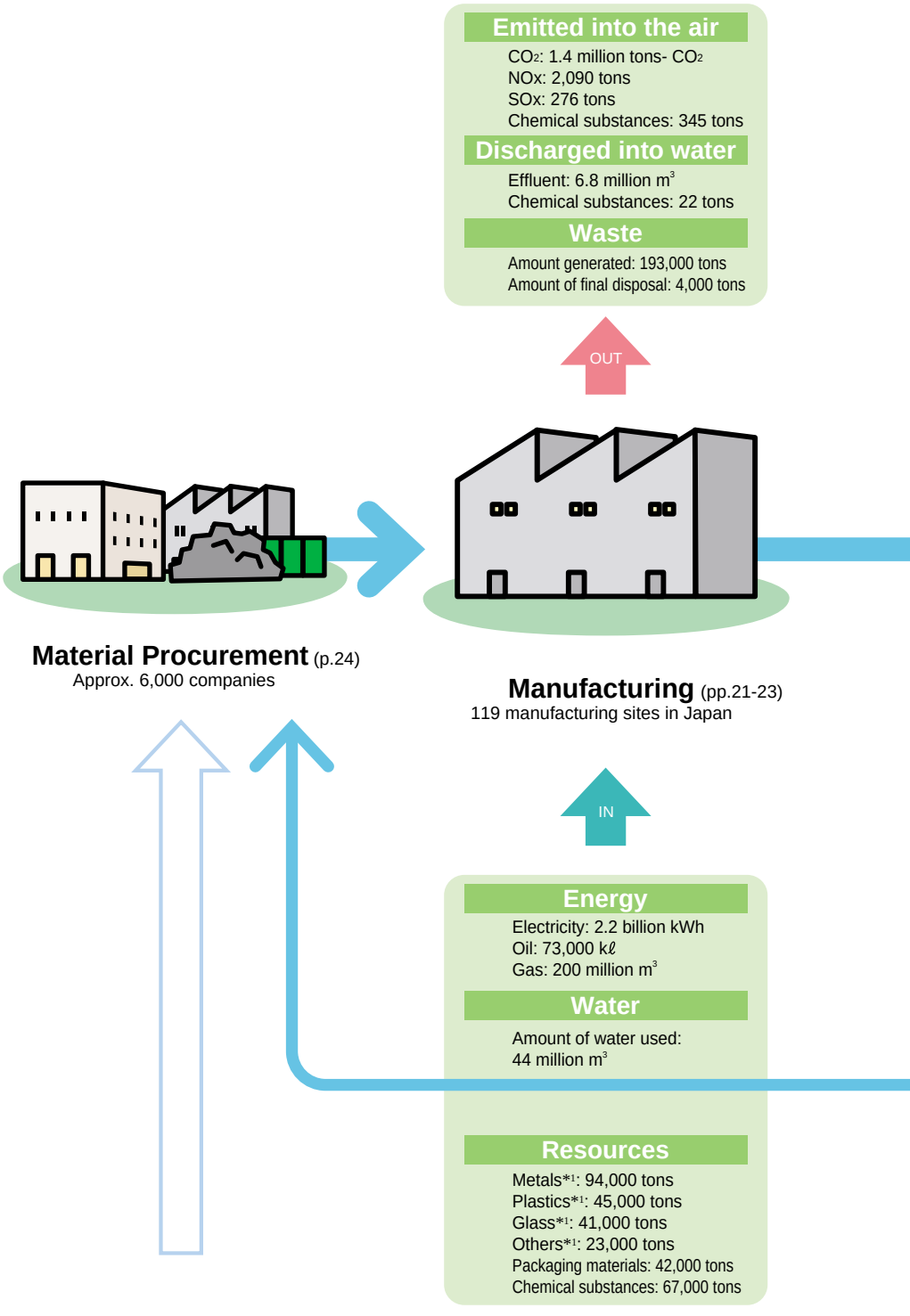
Use

Calculated based on the electricity consumed by each of the seven major product items*1 shipped in FY 2001

Collection and Recycling

Targeting the four categories of end-of-life products designated by the Home Appliance Recycling Law (TVs, refrigerators, air conditioners, and washing machines) that are collected in FY 2001

*1 Seven major product items:
TVs, VCRs, washing machines, microwave ovens, refrigerators, air-conditioners, and mobile phones



Emitted into the air

CO_2: 84,000 tons- CO_2
NOx: 239 tons
SOx: 95 tons
PM (particulate matter): 75 tons

NOx, SOx, and PM calculations are based solely on truck transportation

OUT

Distribution (p.32)
14 sites in Japan (for electric home appliances)

IN

Energy

Fuel for vehicles: 30,000 kℓ

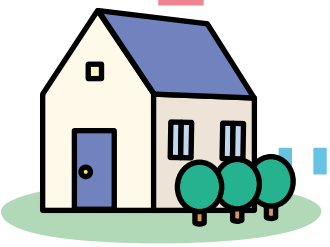
Fuel used for truck transportation

Emitted into the air

CO_2: 5.97 million tons- CO_2

Calculated the amount of CO_2 emissions throughout product use

OUT



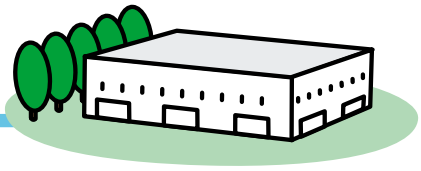
Use (pp.27-29)
Consumers

IN

Energy

Electricity: 16.73 billion kWh

Estimated the amount of electricity consumed throughout product use, based on hours of use and product life



Collection and Recycling (pp.33-34)
27 Recycling points in Japan

Collected resources

Metals: 29,000 tons
Glass: 9,000 tons
CFCs: 114 tons
Others: 6,000 tons

Resources collected in good condition to transfer to operators for paid recycling, as well as free and inverse onerous contract

End-of-life products

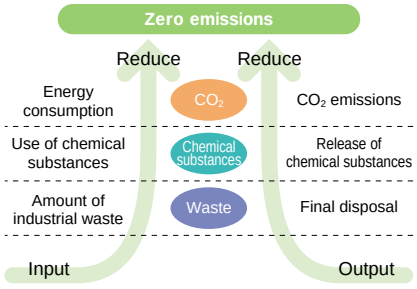
Amount collected: 71,000 tons

Collected amount of the four product items specified by the Home Appliance Recycling Law

Input and Output of Production Activities

The basis of our Clean Factories (pollution-free factories) initiative is the zero-emission concept, which entails our efforts to minimize all input and output at manufacturing sites for both reducing the environmental load and increasing management efficiency. We aim for a comprehensive reduction of environmental load by reducing chemical substance usage and waste in our production processes, as well as CO_2 emissions that result from energy consumption. Thus Matsushita has devoted great efforts to enable its manufacturing plants to become "true zero-emission factories" that can coexist in harmony with the local communities and the environment. Furthermore, we have taken up the new challenge of expanding this effort of zero-emissions factories to our overseas operation sites. This has been advocated in our global goal, the Green Plan 2010.

Realizing Clean Factories



Preventing Global Warming

Energy conservation activities are an important means for arresting global warming through reduction in CO_2 emissions, and also for strengthening management practices. The mid-term plan for the reduction of CO_2 emissions formulated in FY 1998 in line with the Kyoto Conference on Climate Change serves as the basis for our activities. With FY 2010 as the target year, the plan aims at reducing CO_2 emissions by 7% from the FY 1990 level at all domestic manufacturing sites. Since the formulation of this mid-term plan, site-specific targets have been given to each operation site to enable achievement of the plan's 7% target, and a three-year plan has been set up to work towards the reduction. With our business activities expanding immensely into the devices area, reduction in total emissions becomes an even more difficult task. We have included energy conservation activities into the target item categories of our business performance evaluation system (see p.18) and will make the greatest effort to achieve the reduction target.

FY 2001 Performance

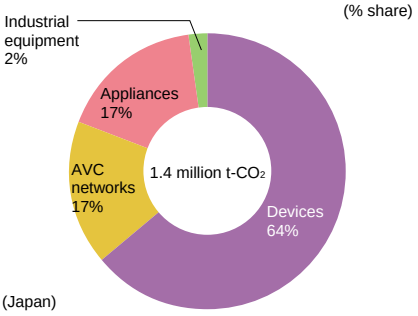
The amount of CO_2 emissions at our domestic operation sites in FY 2001 was 1.4 million t-CO_2, +3% of the 1990 level. We thus succeeded at achieving the FY 2001 target of holding CO_2 emissions at or below the +4% level of the 1990 total. This is mainly due to the fact that FY 2001 energy consumption decreased to about 900,000 kiloliters in crude oil equivalent, a drop of 5% from the FY 2000 level, as a result of our energy conservation efforts in addition to the effects of economic downturn. The amount of CO_2 emissions at our overseas operation sites was 1.88 million t-CO_2, about 1.3 times of our domestic CO_2 emissions, while their total energy consumption was equivalent to 730,000 kiloliters in crude oil. For the purpose of combating global warming, we will further strengthen our worldwide efforts in this area.

Four Key Action Programs

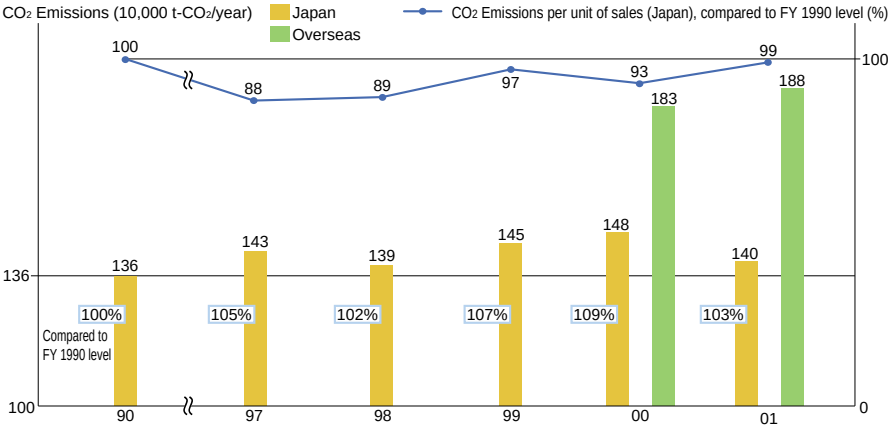
Energy conservation activities are carried out under the Group-wide environmental management system, with individual priority themes pursued at each operation site. In addition to these site-specific themes, Four Key Action Programs, applicable to all operation sites, have also been implemented. Specifically, they are "energy conservation diagnosis," "creation and introduction of energy conservation standards," "development of energy conservation technologies and facilities," and "implementation of the Challenge Competitions (accumulation and exchange of expertise)." The energy conservation diagnosis is being promoted by Matsushita Environmental & Air-Conditioning Engineering Co., Ltd., our ESCO*1 operator, and other specialized agencies. About 58% of all domestic operation sites have undergone the diagnosis, and the necessary measures taken.

*1 Energy Service Company

CO_2 Emissions by Business Segment



CO_2 Emissions and CO_2 Emissions per Unit of Sales



Note: Base for calculating Matsushita Group's CO_2 emissions is as follows

- Calculation is based on the *Environmental Reporting Guidelines* issued by the Ministry of the Environment, retroactive to FY 1990 from FY 2001.
- The CO_2 conversion factor used here is derived from the list of emission factors issued in September 2000 by the Ministry of the Environment, announced after the Review of Methods for Calculating the Emissions of Greenhouse Gases. In terms of electricity, a factor that is the average of all power sources at the receiving end was used. After 1999, however, the factor announced by The Federation of Electric Power Companies Japan was applied.
- The amount of CO_2 reduction resulting from the use of the cogeneration system is calculated by comparing the system's CO_2 emission factor to that of thermal power generation, the source of the purchased electricity.
- For overseas operation sites, the CO_2 emission factor of electricity used is calculated from the composition of fuels used for power generation in those countries.

DATA Energy consumption ➡ p.57; Purchased power consumption ➡ p.57; Electricity produced by cogeneration ➡ p.57.
Energy consumption in the global regions ➡ p.57; Crude oil and kerosene consumption ➡ p.57; City gas consumption ➡ p.57.
CO_2 emissions per unit of joule ➡ p.57.

Efforts at Overseas Operation Sites

In support of the energy conservation activities carried out at overseas operation sites, the parent operation sites*2 in Japan are taking a leading role. For example, we cooperated with the Chinese employees at Beijing Matsushita Color CRT Co., Ltd. in conducting energy conservation diagnoses for their plants. Seminars were also held for twelve subsidiaries in China, thus developing human resources for overseas operation sites and transferring technological expertise overseas. In addition, various activities are carried out to support overseas operations, such as dispatching engineers to Southeast Asian countries and China and offering training in Japan to personnel from overseas operation sites.

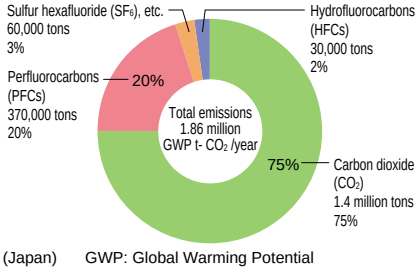
Energy conservation diagnosis underway: Explaining the diagnosis measurement method to trainees at the Beijing operation site

*2 Domestic operation site producing the same product category as the overseas operation site

Reducing Greenhouse Gas Emissions

Other greenhouse gases besides CO_2 are used, including the use of HFC as refrigerant for air conditioners and refrigerators, and the use of PFC and SF_6 for the production of semiconductors and liquid crystal displays. In the semiconductor area in particular, Matsushita has set up a voluntary action plan aimed at achieving the 10% reduction of total emission of PFCs from the FY 1995 level by FY 2010, a target agreed upon at the World Semiconductor Council (WSC). Various measures are being implemented, such as reducing the use of greenhouse gases itself, employing other gases as substitutes, and installing equipment to decompose.

Composition of Greenhouse Gas Emissions



(Japan) GWP: Global Warming Potential

Comprehensive Management of Chemical Substances

Up until now, Matsushita has employed comprehensive management of chemical substances as a foundation of its business activities, seeking to prevent environmental pollution, develop environmentally conscious products, and reduce environmental risks. In March 1999, based on the results of risk assessment, we ranked chemical substances in need of control into three ranks – Prohibition, Reduction, and Proper Management – in accordance with Matsushita's Chemical Substances Management Rank Guidelines. The 33/50 Reduction Plan*3 was drawn up, and measures included within it to reduce the use of chemical substances have been carried out. A mid-term plan was also formulated in FY 2001 with a view to implementing global measures to reduce the use of chemical substances and to ensure proper management of the substances at overseas operation sites.

*3 Using the 1998 level as the baseline, we aim to reduce both the use of substances ranked for Reduction and the releases and transfers of substances ranked for Proper Management by 33% in FY 2001, and by 50% in FY 2004.

Chemical Substances Management Rank Guidelines, ver.2

Rank	Substance group	Production process	Products
Prohibition	33	Prohibit use	Cannot contain substances
Reduction	112	Reduce use	Reduce contents of substances
Proper management	361	Reduce release and transfer	Manage properly and recycle substances
Total: 506 substance groups (1,413 substances)			

Prohibition-ranked substances

CFCs, cadmium compounds, chlorinated organic compounds, hexavalent chromium compounds, nickel compounds, arsenic compounds, etc.

Reduction-ranked substances

Toluene, xylene, HCFCs, antimony compounds, inorganic cyanides, vinyl chloride resin, halogen flame retardants, lead, etc.

Proper Management-ranked substances

Zinc compounds, aluminum compounds, silver compounds, barium compounds, boron compounds, manganese compounds, copper compounds, organotin compounds, etc.

Including all substances specified by the PRTR Law*4

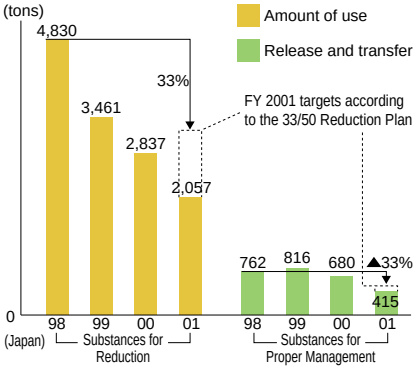
*4 PRTR: Pollutant Release and Transfer Register
PRTR Law: Law Concerning Reporting, etc. of Release of Specific Chemical Substances to the Environment and Promotion of the Improvement of Their Management (Japan)

URL **Chemical Substances Management Rank Guidelines: http://www.matsushita.co.jp/environment/en/m_pdf/chemical-e.pdf**

FY 2001 Performance

From FY 1998 levels, operation sites in Japan reduced the use of substances designated for Reduction by 57% and the amounts of those designated for Proper Management that were released and transferred by 46% in FY 2001. On the other hand, the amounts of chemical substances released and transferred at overseas operation sites had a 10% increase in FY 2001 compared to FY 2000. This increase is attributable to the inclusion of the Victor Company of Japan, Ltd. in the FY 2001 aggregation and the transfer of production sites overseas.

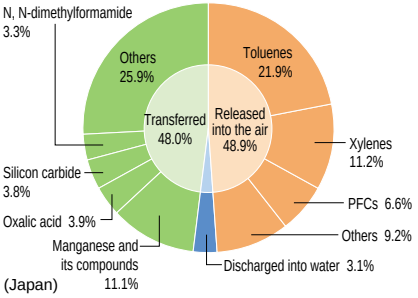
Use, Release, and Transfer of Chemical Substances



Survey Results of Release and Transfer of Chemical Substances in Japan

In FY 2001, 254 chemical substances from 123 substance groups were used. Ethanolamine, which accounted for 25% of the total amounts of substances released and transferred in FY 1999, was reduced to 0.7% thanks to the efforts to reuse it in the LCD business and the recycling of waste liquid. Presently, efforts are being made to develop technology for reducing the emission of toluene, the substance responsible for the largest share of the total chemical releases and transfers.

Breakdown of Release and Transfer



DATA Release and transfer of chemical substances ➡ p.58
Use and release / transfer of chemical substances in the global regions ➡ p.58
Material balance of chemical substances ➡ p.58

Waste Reduction

Throughout the years, Matsushita has worked to minimize the mass of waste going into landfills. Setting up a "zero waste emissions" target for FY 2002, we are making an effort to minimize the mass of final landfill through reuse and recycling. As a result of this effort, we succeeded in achieving target set up by ourselves, as well as those by the government and industry in FY 2000, ahead of schedule. As our next step in FY 2001, we formulated a new mid-term plan with a global perspective to include our overseas operation sites and advance the idea of controlling the generation of waste, and we have already carried out activities under the plan.

Zero Waste Emissions means:

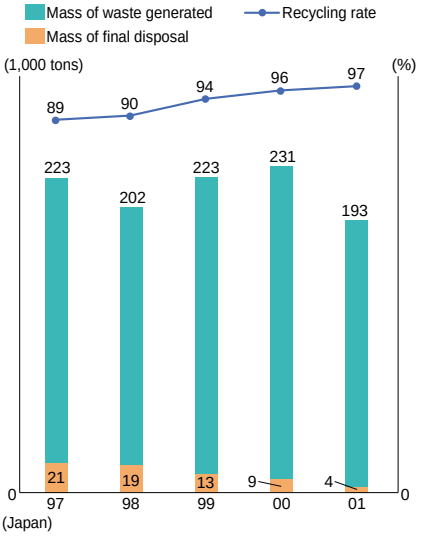
Recycling rate: 98% or above

$$\text{Recycling rate} = \frac{\text{Mass of recycled materials}}{\text{Mass of recycled materials} + \text{Mass of final disposal}}$$

FY 2001 Performance

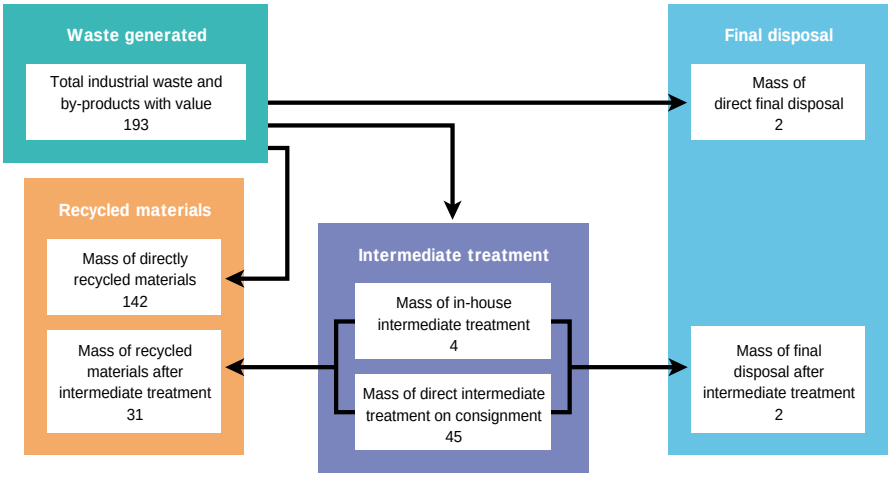
In FY 2001, the recycling rate for Japanese operation sites was 97%, surpassing the 96% target, and the mass of waste for final disposal was 53% less than that of FY 2000. In addition to the declaration made by Kyushu Matsushita Electric Co., Ltd. for having achieved the zero waste emissions, 19 other Matsushita operation sites were also commended with the Recycling Promotion Conference Chairman's Award, a tribute to our waste reduction efforts. Worldwide, however, we generated 430,000 tons of waste in FY 2001, an increase of 3% compared to FY 2000. This was due to the inclusion of Victor Company of Japan, Ltd., and the transfer of our manufacturing sites to overseas. Compared to FY 2000, the amount of waste per unit of sales has increased by 15%, with overseas operations accounting for 55% of the total. For this reason, we will step up waste reduction efforts at overseas operation sites.

Mass of Waste Generated and Final Disposal, and the Recycling Rate



DATA Generated waste and final disposal waste ➡ p.59
Waste in global regions ➡ p.59

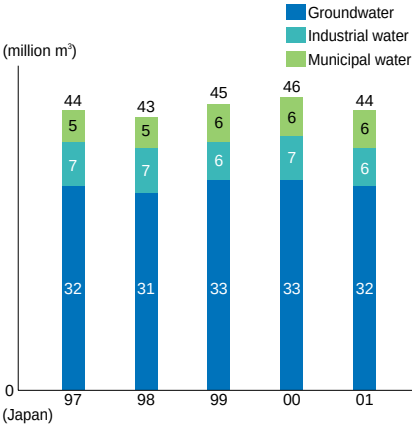
Management Flow for Industrial Waste and By-products with Value (Japan) (Unit: 1,000 tons)



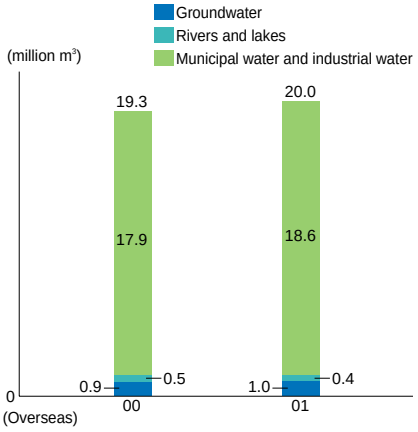
Efficient Use of Water Resources

The device business, including manufacturing of semiconductors, requires a large amount of water resources for cleaning and cooling. Mainly in the device business, we have implemented initiatives for treating, purifying, and reusing effluents. In FY 2001, we used 44 million m^3 of water in Japan, and 20 million m^3 at overseas operation sites, totaling 64 million m^3. Compared to the 65.3 million m^3 of water used in FY 2000, we managed to put a halt to the increase in our global water consumption.

Water Consumption (operation sites in Japan)



Water Consumption (overseas operation sites)



Effects on the Air and Water

DATA NOx and SOx emissions, and environmental load of water pollutants (COD, nitrogen, and phosphorus) ➡ p.59

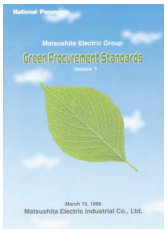
Material Procurement

Matsushita is conducting business with the support of about 6,000 material suppliers in Japan. In order to offer environmentally conscious products, we must make sure that every piece of the material we purchase is also environmentally conscious. Since FY 1999, we have practiced green procurement to purchase materials for production using clearly defined procurement standards. We also conduct studies on chemical substances contained in the parts and materials. In FY 2001, we began full-scale implementation of green purchasing, drawing up internal rules for purchasing office supplies.

Green Procurement

In FY 1999, Matsushita began to address green procurement with its Corporate Purchasing Departments taking the lead in the efforts by issuing the *Green Procurement Standards Manual* and the *Chemical Substances Management Rank Guidelines*, which incorporate the objective of reducing environmental load in addition to the original objectives for quality, cost, and delivery of supplied materials. Green procurement uses clear standards for evaluating suppliers and materials in order to choose materials with high overall rating. In FY 2001, we have completed the evaluation of 3,173 suppliers in Japan and examined the chemical contents of about 80,000 components. Further evaluations and studies will be carried out.

Chemical Substances Management Rank Guidelines, ver.2



Green Procurement Standards Manual

An Overview of Assessment Using the Green Procurement Standards (Japan)

- Supplier evaluation: 3,173 companies (accounted for over 90% of domestic purchases)

Re-selection of suppliers

- Material assessment: examined chemical contents of about 80,000 components

Registration to the product assessment database

Green Procurement Assessment Criteria

Supplier Assessment Criteria

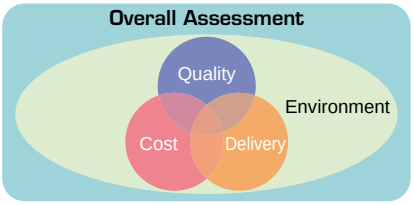
- Acquisition of ISO 14001
- Corporate philosophy and policy on the environment
- Environment-related corporate organization and planning
- Environmental impact assessment
- Environmental education/information disclosure
- Rationalization of distribution activities

+

Material Assessment Criteria

- Observance of laws/regulations
- Forbidding the use of prohibited substances
- Chemical Substances Management Rank Guidelines
- Prevention of vibration/noise/odor
- Reduction of the harmful or poisonous levels of waste at disposal
- Conservation of energy and resources, and utilization recycled resources
- Recycling-oriented design
- Disclosure of the environmental information of materials
- Reduction of the environmental burden of packaging materials

From QCD to QCD+E



Development and Introduction of Environmentally Conscious Electrical Wire

In electric appliances, halogen compounds such as vinyl chloride resin are generally used to provide electrical insulation and fire resistance to electrical wires. Wires also contain heavy metals such as lead and phosphorus. The environmental load resulting from their disposal causes concern. In FY 1998, in cooperation with major electrical wire manufacturers, we started to develop wires that do not contain halogen compounds or heavy metals. Consequently, we succeeded in developing low-voltage lead wire for practical use in the internal electrical wiring of products. Then we worked to develop environmentally conscious AC cords that aimed at further reducing environmental load. In FY 2001, we evaluated the quality and safety of AC cords for 125V/7A, Matsushita's most commonly used specifications, for in-house standardization. This allowed integration of the several hundred types of electric cords currently in use into four types. In FY 2002, we will work on the introduction of these AC cords into products and expanding the range of product applications.

Environmentally conscious AC cord

Green Purchase

Matsushita started to purchase recycled paper in FY 1991 with a view toward conserving forest resources, well before the term Green Purchase was introduced. Since then, we have proactively used environmentally conscious office supplies such as stationery.

In FY 2001, we formulated the internal "Rules for the Promotion of Green Purchase" to clarify the steps and enforced the rules at all our domestic operation sites. For office supplies, the green purchase criteria have been set up. These criteria will be expanded to include uniforms and company cars in the future.

Green Purchase Criteria (excerpts)

Category		Criteria
Papers		
	Copy paper	100% recycled paper with below 70% whiteness
	Form paper	70% recycled paper with below 70% whiteness
	Printing paper	70% recycled paper with no coating for easy recycling of the paper
		Below 70% whiteness for non-coated paper
	Toilet paper	100% recycled paper
Stationery (Applicable to all kinds of stationery)		
	Plastics	Over 40% recycled materials in weight
	Wood	Use of materials from tree thinning
	Paper	Over 50% recycled paper
Equipment (chairs, desks, etc.)		
	Plastics	Over 10% recycled materials in weight
	Wood	Use of wood materials from tree thinning and causing less than 1.5 mg/ℓ of formaldehyde release

Points for Consideration

- Product packaging shall give consideration to easy recycling and lower environmental load at disposal
- Product design shall give consideration to facilitating repair, change of parts, reuse of parts, and recycling of materials

Status of the Purchase of Office Supplies (Japan)

Category	Quantity of purchase
Copy paper	300 million pieces
Printing paper (converted to A4 size)	200,000 pieces
Stationery	3,700 items
Equipment	8 items

TOPICS

Recycling Initiatives Transcending Industries

Nagaoka Site is one of the main manufacturing plants of the Semiconductor Company, one of Matsushita's division companies established in 1968 in Kyoto. The site is active in advanced efforts, as exemplified by its achievement of complete zero waste emissions in Oct. 2000. Complete zero emissions refer to the achievement of zero emissions in both industrial and municipal wastes. Jiichi Nakaki of the Company's Environmental Promotional Group is active in promoting establishment of various recycling systems and in approaching government offices and other companies in the community.

Low-cost Recycling of Hydrofluoric Acid Waste

The recycling of hydrofluoric acid waste is our biggest challenge in achieving zero emissions. Nakaki said, "In the semiconductor manufacturing process, a large amount of hydrofluoric acid is used for cleaning silicon wafers and glass apparatus. Hydrofluoric acid is an industrial waste that requires special management because of the tremendous load it places on the environment. It accounts for the largest portion of industrial waste released from our site. In the past, a coagulation-sedimentation process has been used to eliminate the toxicity in hydrofluoric acid waste. The supernatant resulting from the process was discharged into the rivers and the sludge disposed of by landfill."

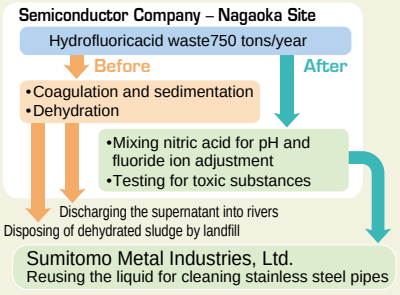
Compared to solids, it is generally much more difficult to recycle liquids. He added, "It was generally considered impossible to recycle hydrofluoric acid. Even if it were possible, it would be very costly if new equipment and plant facilities had to be installed to treat the acid. So we pursued recycling methods that would require no new facilities."

They started by studying other industries. "We suspected that the liquid was waste for semiconductor manufacturing but might still be useful for other industries. The result of our studies showed that iron and steel manufacturers use virgin industrial hydrofluoric acid to clean the surface of stainless steel pipes. Since their required concentrations of the acids are similar to ours, we approached Sumitomo Metal Industries, Ltd., a major iron and steel manufacturer."

Until then, nobody at the Nagaoka Site had contact with the iron and steel industry, and the recycling of hydrofluoric acid was never considered. He explained, "Many issues had to be resolved before the recycling was made possible. Among them, the biggest hurdle was the inadequate cleaning power of the hydrofluoric acid waste. After repeated studies, we found that combining nitric acid waste with hydrofluoric acid waste raised the cleaning power (a patent has been granted). This method is favorably received by Sumitomo Metal Industries, Ltd. because it can procure hydrofluoric acid at lower cost than before."

In this way, they succeeded in establishing an ideal recycling system that is beneficial to both the recipient company and Matsushita. They are also working on expanding this system to include an even wider range of industries. He adds, "Besides the semiconductor industry, hydrofluoric acid is also used by industries such as glass, fiber optics, and even in the manufacturing of tombstones. For this reason, use of our recycling system is sure to be further expanded. More than fifty companies representing different industries have already contacted us expressing interest in adopting our recycling system even by bearing the royalty. Since no special treatment is required on their part, it will still be economical for them."

Recycling of Hydrofluoric Acid Waste at the Nagaoka Site



Governor's Recommendation Brought Commendation by the Ministry of the Environment

Thanks to a recommendation made by the Governor of Kyoto Prefecture, the Nagaoka Site received the Award for Excellent Efforts in Preservation of Air Quality commended by the Ministry of the Environment in December 2001. The site was recognized not only for having achieved zero waste emissions but also for its efforts in actively approaching many other industries in Kyoto Prefecture to encourage zero waste emissions activities. It is quite rare for a private company to be awarded such an honor. Nakaki stated, "In the Otokuni area of Kyoto Prefecture where our plant is located, there are many operation sites belonging to different industries. Therefore, we proposed the establishment of a joint public/private environmental study group, involving 13 major companies in the area and the government of Kyoto Prefecture. We served as the first secretariat company of the group." (The study group is still active.)

Participated in the Kyoto Environmental Festival 2001

The site is also active in working with the local communities by disseminating information about zero emissions and hosting lectures. In May 2002, they received the Eco Kyoto 21 Certification for Environmentally Leading Businesses from the Kyoto Prefecture. "We will further strengthen our ties with local communities and continue to make improvements in order to build a resource-recycling society," said Nakaki.

Received the Award for Excellent Efforts in Preservation of Air Quality commended by the Ministry of the Environment

Jiichi Nakaki
Environmental Promotion Group
Semiconductor Company
– Nagaoka Site

"Our achievement is made possible with the cooperation of external organizations and individuals, such as our local government. We will not settle for what we have accomplished but will address 'Reduce' in our handling of waste as well, thus promoting 3R activities."

Establishing the Method of Energy Conservation Diagnoses

In FY 2001, the Matsushita Refrigeration Company received the Agency of Natural Resources and Energy's Director-General Prize as a commendation for Energy Conservation Best Practice Award. It was recognized for having established a method for energy conservation diagnoses at production sites and building a standardized procedure to carry out the diagnoses. Masaichi Tanaka of the company's NT Business Division said with confidence that the maximum reduction of over 40% in energy consumption is "a result that exceeded expectation."

Drastic Reduction in Energy Consumption

Matsushita Refrigeration Company is a comprehensive industry that is comparable to the automobile industry. Its production of refrigerators and automatic vending machines encompasses various processes including casting, machine works, assembly, welding, painting, pressing, etc. Tanaka said, "Since our manufacturing facilities are diverse and the operating conditions change from time to time, simple energy conservation measures will not be effective. In fact, the effectiveness of the traditional plan to drastically overhaul the facilities reached the ceiling by 1998. Since such improvement would also create a burden in terms of cost, we tried to find ways to reduce energy consumption using the existing facilities. Under the leadership of the Energy Conservation Committee, we continued reviews and studies and finally came up with our original energy conservation diagnosis."

Technique to Expose "Invisible Wastefulness"

This energy conservation diagnosis uses a power meter to obtain time-series data covering power consumption of each item of machinery and equipment and to combine this with the number of products being manufactured to ferret out wasteful use of electricity. "Our goal was to establish a system that would enable us to correctly identify and diagnose problems even without the specialized knowledge of a particular manufacturing process. By accumulating the diagnosis expertise gradually, we were able to compile manuals to establish standardized procedures," said Tanaka.

Ideally, the facilities' power consumption shall be in proportion to the number of product units being manufactured. "However, we found out that we were actually consuming the same level of energy when there were zero units in production as we were at full operation." He explained, "For example, we found a pump that was always in full operation at our press forming line even though there was rarely any need to use it. We revised the program to put the pump in operation only at need, thus achieving a 39% reduction in power consumption at the production line."

Members of the Energy Conservation Committee who helped to realize the diagnosis method

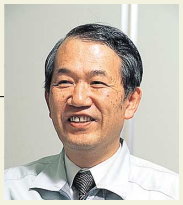
Electricity Reduction Rates at Matsushita Refrigeration Company

Process	Domestic operation site	Overseas operation site
Machine work	24%	36%
Press	39%	32%
Resin molding	15%	(Not yet carried out)
Circuit packaging	27% 33% gas	–
Annealing	–	13.4%
Coating	47%	(Not yet carried out)
Air Compressors	10%	5.3%

Better Than Anticipated Result at All Production Lines

He further commented, "The reduction results of our initiative were better than anticipated at all our production lines. The initiative began with the Refrigeration Division, but it has also produced impressive results at four operation sites overseas. We plan to further upgrade the system and contract it out as a consulting business. We would like to use this expertise that was originated at our production site to help accelerate the energy conservation activities of our society at large in order to contribute to arresting global warming."

Masaichi Tanaka
NT Business Division
Matsushita
Refrigeration Company



"We have become skillful enough to spot any waste in energy use just by looking at the equipment."

Dalian City Commending China Hualu Matsushita AVC Co., Ltd.

The China Hualu Matsushita AVC Co., Ltd., which manufactures VCRs and DVD players, is located in Dalian City at the southern tip of China's Liaoning Peninsula. In tandem with the growth of the Chinese economy, Dalian City is steadily transforming itself into a modern city. As the 7th manufacturing site in China that had acquired the ISO 14001 certification in 1998, they have implemented a wide range of activities with a focus on environmental conservation at the plant, with energy conservation as a primary example.

Efforts for Conserving Water Resources

Despite the severe business environment it faced in 1998, they constructed a comprehensive wastewater treatment facility. This facility was designed to improve water quality to a level surpassing the City's effluent standard. The treated water is utilized for the watering of greenery at the plant site. In addition to reducing the pollution of the water system, the facility also contributed to water savings of about 100,000 tons annually, benefiting the local communities of Dalian City suffering from severe water shortage.

Efforts for Energy Conservation

Conserving energy in the production process is a difficult task. The biggest challenge was presented by reducing energy consumed by the power equipment, which accounted for 55% of the total power consumption of the entire operation site. Since 1999, energy management has been enforced mainly on the air conditioning facilities, promoting rationalized use of energy and facility improvement. As a result, about 270,000 kWh of electricity was saved in FY 2001. In addition, while maintaining the level of product quality, they also boldly introduced innovative production technologies to its manufacturing process, substantially curbing energy consumption.

Commended by Dalian City

Recognized for these strenuous efforts and impressive results, they were commended by Dalian City in the first Environmental Protection Business Leader Award in June 2001. They will continue to make improvements to maintain themselves as befitting the honor of a model company.

Environmentally Conscious Product Design

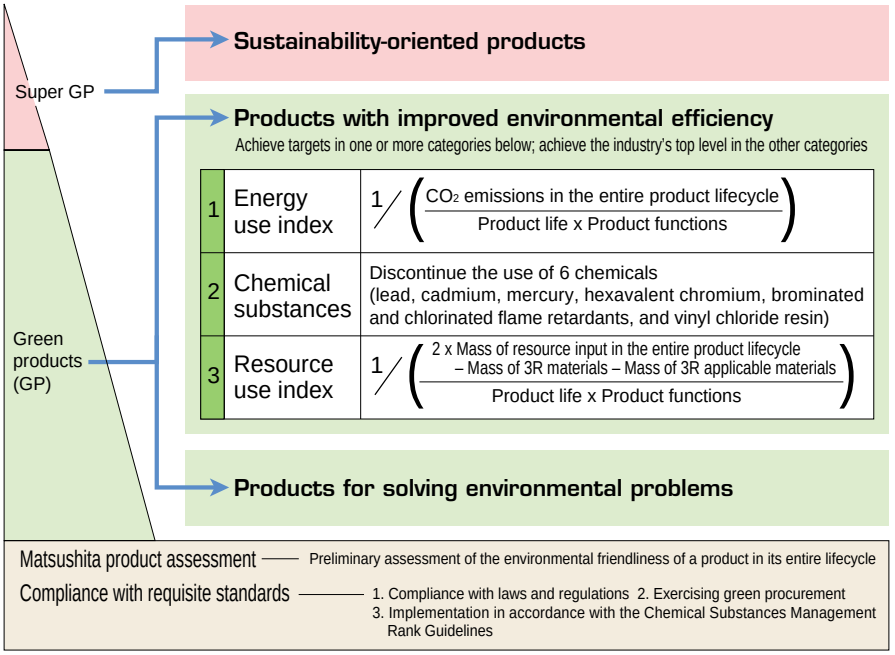
In FY 2001, we reviewed the existing standards for environmentally conscious product design, and upgraded them by defining their content more clearly. This work also established the Energy Use Index and the Resource Use Index and discontinued the use of six chemical substances. Starting in FY 2002, we will incorporate the content of the revised standards into the performance evaluation for "environmental management." By positioning this as one of the important pillars in management, we will strive to make our products environmentally friendly.

Development of Green Products

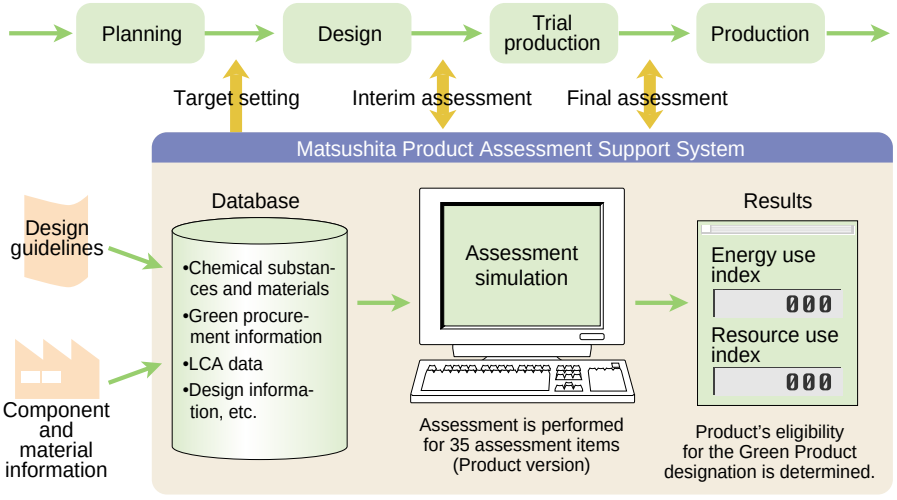
We define "Green Products" as products that feature environmentally conscious design. When we formulated the Green Plan 2010 (see p.7) in FY 2001, we reviewed the requirements for Green Products and created two new indices, the Energy Use Index and the Resource Use Index. We have categorized Green Products into three categories: "products for improving environmental efficiency" offering a greater efficiency in energy and resource utilization while cutting back on the use of chemicals; "products for solving environmental problems" developed with the objective of addressing environmental problems; and "sustainability-oriented products" attaining the status of "Super GP (Super Green Products)"–the superordinate concept of Green Products newly adopted in FY 2002–through innovative environmental technologies. Matsushita's Green Plan 2010 sets the goal of raising the development rate of Green Products to 90% by the end of FY 2010. In order to accelerate our efforts to attain this goal, we included this Green Product development rate as an item for evaluating the performance of environmental management at Matsushita division companies and affiliated companies in FY 2002.

DATA Products Labeled with Environmental Characteristic Stickers ➔pp. 69-70

■Criteria for Green Products (GP)



■Overview of the Matsushita Product Assessment Support System



Matsushita Product Assessment

We have developed the Matsushita Product Assessment System that evaluates a product's environmental impact during its entire lifecycle. Since we introduced Version 1 of the system in 1991, which designated resource conservation and recycling as assessment items, we have upgraded the system in stages by adding assessments of both chemical content and a product's environmental load when in use. Today, in its fifth version, the system incorporates the LCA (lifecycle assessment) technique.

In FY 2002, we made the Matsushita Product Assessment a prerequisite to Green Product designation. To perform the assessment efficiently, we use the Matsushita Product Assessment Support System. Combining a variety of data on a newly developed product, the System calculates the chemical content as well as the energy use index and resource use index of the product, thus allowing us to make an efficient and multidimensional evaluation of the extent of the product's environmental impact.

Promotion of the Development of Common Environmental Technologies

Aiming to stimulate innovation of environmental technologies throughout Matsushita through company-wide sharing of advanced environmental technologies and accomplishments in product development, we held a briefing session and an exhibition on development of common environmental technologies on February 27, 2002.

Reports presented in the briefing session centered on “lead-free solder,” “a product assessment system including a study on chemical substances” and other achievements and issues concerning the FY 2001 areas of focus. The concurrently held exhibition showcased practical applications of technologies and specific environmental activities. The session and the exhibition together attracted some 300 participants. We will strive to further promote information sharing among engineers, in pursuit of the quick penetration of outstanding environmental technologies and initiatives throughout Matsushita.

Briefing Session and Exhibition on Development of Common Environmental Technologies

Date and Time: February 27, 2002 10:00 – 17:00
Major topics covered in the sessionand exhibition

- Lead-free soldering technology
- Product assessment system including a study on chemical substances
- Environmentally conscious AC cords and PVC-free components and materials
- Flame retardant plastic recycling technology and assessment of recyclability of halogen-free resins
- Development of 3R manufacturing technologies
- Development of technologies for recycling and treatment of discharged chemical substances, etc.

At the briefing session: advanced environmental technologies and efforts were presented.

Printed circuit boards manufactured with mass production technology using lead-free soldering

Commercially developed TV composed of 50% recycled resin and 10% recycled glass.

Efforts toward Abolition of Use of Lead Solder

Aiming to reduce the use of chemicals potentially harmful to people and the ecosystem, we have set a target of introducing lead-free solder in all our products on a global scale by the end of FY 2002. To this end, we created the Lead-free Solder Project under the Environment Conference and are pressing ahead with the establishment and adoption of the technology required for this goal.

By the end of FY 2001, lead-free solder was employed in 130 products manufactured in Japan and 21 products manufactured by 32 of our companies overseas. Since we became the world’s first company to introduce and mass-produce lead-free solder three and a half years ago, we have produced a total of approximately 22 million units that use lead-free solder. We are accelerating our efforts toward comprehensive development of materials, production techniques and facilities, as well as practical applications, with the aim of realizing production of a wide variety of high-quality products. We primarily rely upon a tin-silver-copper solder, for which Matsushita holds a Japanese patent jointly with Senju Metal Industry Co., Ltd. We are promoting licensing activity to enable global use of this solder. At the same time, we are seeking to broaden the range of practical applications of lead-free solder by also employing other solder such as a tin-zinc-bismuth solder, which allows soldering at lower temperatures, and our proprietary tin-silver-bismuth-indium solder.

As a measure to promote the use of lead-free solder within Matsushita, we have drawn up general guidelines based on demonstration research and case studies of operation sites that took the lead in introducing the new solder. The guidelines, which were distributed throughout the company, prescribe the specifications for technology introduction and test methods and criteria for quality reliability assessment for each major process and recommended solder materials. Another measure to accelerate the introduction of lead-free solder into all products is the opening of Lead-free Solder Technoschools in both Japan and overseas (see p.14) that offer a setting for learning, hands-on training and demonstration.

We were also the first in the world to commercialize lead-free plating of component electrodes used in devices. About 86% of new semiconductors, or 1,433 models, now use lead-free plating. Also, the preparation for the introduction of lead-free planting in all electronic components was completed in FY 2001. Currently, efforts to accept and introduce this technology are being made at our business partners.

Examples of Products Employing Lead-free Solder (as of the end of FY 2001)

Mobile phones 5 models

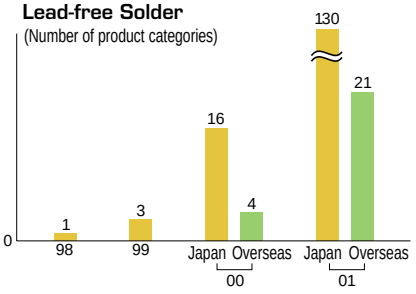
A total of 3.08 million units produced

VCRs All models

A total of 3.37 million units produced(NV-SVB300)

NV-SVB300

Number of Product Categories Using Lead-free Solder



Improvement in Energy Conservation Performance

We endeavor to reduce products’ in-use energy consumption by improving their energy conservation performance. These efforts earned us top-class ranking (third or higher place) in 16 categories, including the top spot in four categories in the washing machine category, on the Energy Conservation Performance Catalog (2001 winter) published by the Energy Conservation Center.

Ranking by the Energy Conservation Performance Catalog (those ranked third or higher)

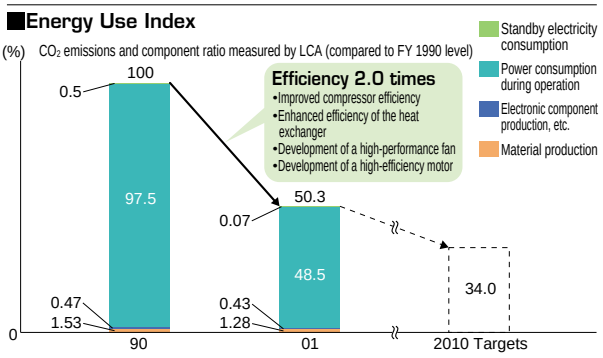
Product	Category
Air conditioners	2.2-kW Class, 2.5-kW Class No.1 4.0-kW Class
Refrigerators	500 liters or larger No.1, 350-400 liters 300-350 liters, 250-300 liters No.1
TVs	Wide-screen (BS 36-inch model BS 32-inch model No.1), Standard screen (25-inch model, 21-inch model
Washing machines	8.0kg No.1, 7.0kg No.1, 6.0kg No.1, 5.0kg No.1, 4.2kg

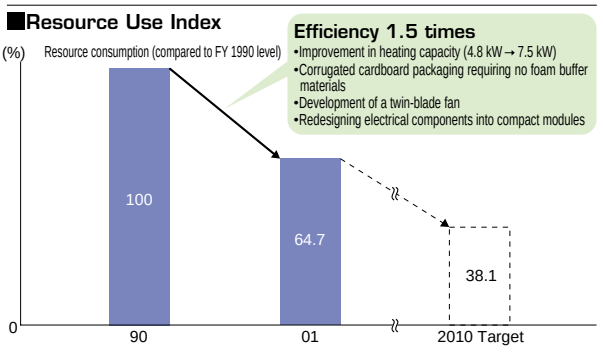
Improvements Shown in Energy Use Index and Resource Use Index

Air Conditioners

Reduction of Chemical Substances with Large Environmental Load

- Use of CFC substitutes as a refrigerant
- Use of a PVC-free drain hose
- Use of halogen-free resin

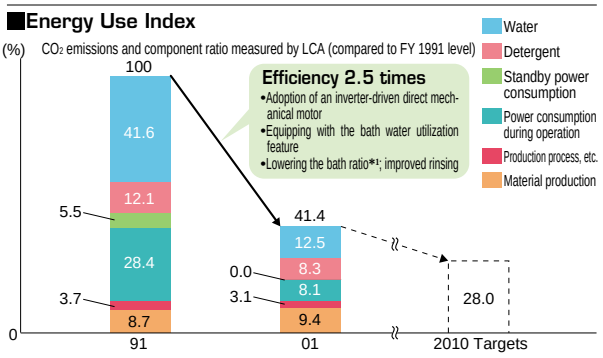


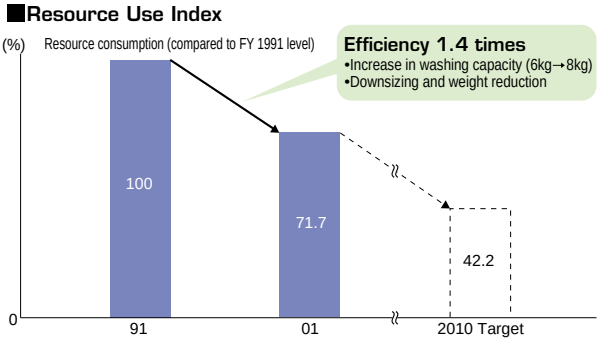


Automatic Washing Machines

Reduction of Chemical Substances with Large Environmental Load

- Use of a PVC-free bath water suction hose
- Use of lead-free electrical wires/lead-free solder





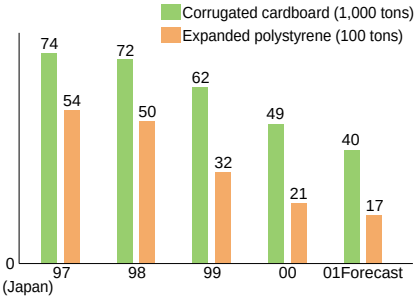
(Note) The 2010 target figures are a rough estimate using FY 2001 as the base year.

*1 Bath ratio means the ratio of the amount of water used to the weight of the laundry

Environmentally Conscious Packaging

Going back to the fundamental purpose of packaging, which is "to ensure product quality," we pursue optimum packaging that best suits the specific characteristics of the products. Acting on the principles of "elimination," "drastic reduction" and "reuse" of packaging materials, we strive to reduce the use of materials (efficient use of resources) and energy during transportation, cut down the amount of waste generated, and improve packaging efficiency by streamlining the packaging process.

Use of Major Packaging Materials



Air Mold

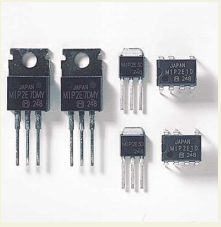
In pursuing an ultimate packaging material, we focused on a material that makes use of air and developed "Air Mold," a highly efficient buffering material. Air Mold, a multi-layer-structured film filled with air, combines outstanding shock absorbing properties with resource conserving composition and light weight. It can be reduced to 1/250 of its original size for disposal. The new packaging material was first used in packaging portable DVD players and is now also used for such large-scale products as washing machines. Through its use, we were able to reduce the use of corrugated cardboard by 415 tons annually. We will continue working to reduce the use of packaging materials by promoting the introduction of Air Mold to all operation sites and expanding the list of products packed with this material.

A washing machine packaged with Air Mold

TOPICS

IPD Becomes the First Semiconductor to Win the Energy Conservation Award

Matsushita's IPD (Intelligent Power Device), a development for switching power supplies that reduces standby power consumption, was honored with the FY 2001 Minister of Economy, Trade and Industry Prize of the Energy Conservation Award, thereby becoming the first semiconductor product to win the award. IPD earned high acclaim not only for lower standby power consumption –a reduction of about 81% compared with conventional models– but also for its resource and space efficient one-chip configuration.



IPD won the FY 2001 Energy Conservation Award

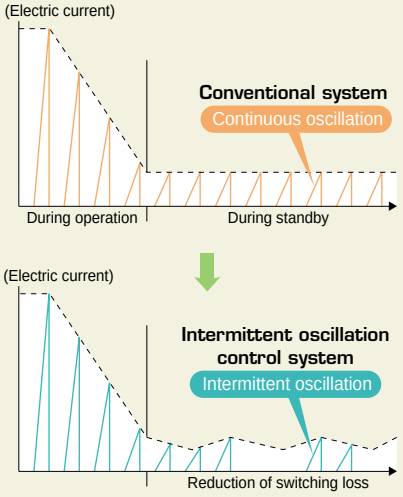
A Mechanism of Standby Power Consumption

In recent years, greater attention has been focused on standby power consumption as an indicator of the energy conservation performance of electric appliances. The standby power consumption takes place at the power unit of an appliance, typically an AC adapter. The power unit supplies the main unit with the electricity it needs. An electrical current continues to pass through the power device even in standby mode, when the main unit is not in operation. This is why the AC adapter becomes warm to the touch.

"Thinned-out Control" Dramatically Reduces Switching Loss

An electrical current that passes through the power device is not constant but rather oscillates, alternating between "on" and "off" states. Every time the switchover takes place, electricity is wasted as a "switching loss." Our solution to this problem was the development of an "intermittent oscillation control system," which curtails electric current and oscillations during standby. In other words, the technique decreases the number of oscillations to match the electric energy, so as to let only the necessary electric current flow. There is an interesting anecdote about the innovation of this technology. When the engineers developed the first IPD seven or eight years ago, they found the device's operation became slightly unstable during standby, although it met the standards. So, they corrected this minor glitch in the next version. The resulting device provided stable operation, but it consumed more electricity, becoming less efficient. To surmount the problem, the engineers took a counterintuitive approach: deliberately introducing unstable operation. When tested, it worked beautifully, and power consumption was reduced. Further improvements were made to control the instability, or the thinned-out state, before we perfected the "thinned-out control." Thus, a somewhat strange phenomenon of being unstable yet highly efficient served as an inspiration to them.

Intermittent Oscillation Control System



Applicable Electric Home Appliances

(up to 60W)

TVs (power for a remote control)
VCRs (main body)
Portable/Stationary DVD players (main body)
Digital video camera (battery charger)
Digital still camera (battery charger)
Desktop/Notebook computers
(main body/power during a standby state)
Mobile phones (battery charger)
Cordless phones (main body)
Microwave ovens (main body)
Electric rice cookers (main body)
Air conditioners (main body)
Lighting apparatus

Energy Conservation Effect

(assuming a propagation of 30 million units a year)

Reduction of power consumption in standby mode

A saving of about
Electricity bill **¥1.5 billion**

Reduction in CO_2 emissions (as a gas)

about
Reduction equivalent of **69 million barrels**

No-load power consumption(with an input of 100V):

MIP0225 (existing model)	0.35 W
MIP2E5D	0.065W

Aspiring to Set the Standard for Power Units

The power device, along with dozens of circuit components to control it, has conventionally been mounted on a circuit board. By integrating them together into a single power device, we were able to reduce the number of components (approx. 90%) as well as the size (approx. 30%) compared to conventional products. Yuji Yamanishi of Semiconductor Company says, "Our effort to reduce the size and weight of the power unit was driven by the global trends toward the prevention of global warming. It was also encouraged by the fact that Japanese electronics home appliance manufacturers are leading the world in reduction of standby power consumption." The maximum power output for this IPD is now 60 W, and it can be utilized by 70-80% of all electric appliances. At present, an IPD for greater output capabilities are under development.

Since the fall of 2001, when we first introduced its IPD to the market, we have pushed for getting the device into widespread use, gaining momentum from the winning of the Energy Conservation Award. We plan to incorporate it into a wider variety of appliances that will reach the homes of our customers. The next version, which will realize further reductions in power consumption and size, is slated for introduction in FY 2002.

Examples of Applications to Products

TV door phone
HA-S601K-TW

Cordless vacuum cleaner
"Canister"
(with a rechargeable battery)
MC-BX11

URL **Power devices for switching power supply (Japanese only)**
http://www.panasonic.co.jp/semicon/pr_jpn/orange.html

Yuji Yamanishi
Discrete Division,
Semiconductor Company

"The time has finally arrived when this technology reaches full flower. We are going to make further improvements to the IPD and push forward to get it into widespread use, so that it will become a product standard."

TOPICS

Natural Fluid (HC) Refrigerator, Aspiring to Become the Global Standard

In past years we have used a non-ozone-depleting CFC substitute (HFC-134a) as a refrigerant for refrigerators. The substance, however, has a global warming potential of as high as 1,300. At the Kyoto Conference on Climate Change held in 1997, this substance was designated as one of the greenhouse gases and a reduction target was set. Accordingly, we pursued development of cooling technology that utilizes isobutane, and refrigerators with this new refrigerant went on sale on February 1, 2002.

Natural fluid (HC) refrigerator
NR-C32EP

A Variety of Means to Exploit the Refrigerant Isobutane

Isobutane, a refrigerant we have adopted, is highly energy efficient yet inexpensive. Haruyuki Ishio of Matsushita Refrigeration Company says, "It is an excellent refrigerant. In fact, it has enabled quieter operation, while saving 5% more energy than conventional models. But there was one drawback: it's flammable. So, we directed our developmental efforts to ensuring safety. The total number of patents we've obtained in the process has reached 87 (634 inventions), two to three times the number we would usually obtain for the development of ordinary products." Matsushita's engineers have devised a variety of means, such as using a double-cylinder glass radiant heater for defrosting –an absolute necessity for a country with high humidity like Japan– and holding the surface temperature at 340℃, which is lower than the ignition point of isobutane (460℃). They have also reduced the number of tube joints to prevent refrigerant leakage. To ensure safety at the time of product disposal, a collection channel of used products is established.

Environmental Loads of Refrigerants

Refrigerant	CFCs (CFC-12)	1994 CFC substitute*1 (HFC-134a)	2002 Isobutane (HC-600a)
Global warming potential	8,500	1,300	3 – 5
Ozone depletion potential	1.0	0	0

*1 In Japan, in compliance with the Home Appliance Recycling Law, we collect the CFC substitute used as a refrigerant, to help abate global warming.

Major Technologies for HC Refrigerant

- Reduction of the amount of sealed-in refrigerant by accumulator miniaturization (130 g→50 g)
- Development of a double-cylinder glass radiant heater for defrosting (Surface temperature of the glass tube: 650→340℃)
- Increasing the efficiency of the compressor
- Reduction in the number of welding points on the evaporator tubes (14→4)

* In addition to the elimination of CFCs, we have also achieved a drastic reduction in the use of lead and PCBs, substances with high environmental load.

Great Response and Brisk Sales

The natural fluid (HC) refrigerator, which won Grand Prize of the Nikkei BP Technology Awards for its environmentally friendly features, is receiving much attention in various quarters. However, if we pass the cost of making products environmentally friendly on to customers, the products won't come into widespread use. So, we seek to produce innovative products that offer the same functions as those of conventional models, yet at a reasonable price. Ishio says, "From the moment you make a purchase, you will start enjoying the benefits of quieter operation and greater energy-saving capability compared with conventional models. Your children and grandchildren will also benefit from its environmentally sound features. So, this is the product we'd really like you to choose. We also expect that there are great opportunities for its components and materials businesses to grow, by eventually making all products natural fluid and establishing the new technology as the global standard."

URL Natural fluid (HC) refrigerator (Japanese only)
http://www.national.co.jp/nonflon/

Haruyuki Ishio
Refrigeration Research Laboratory
Matsushita Refrigeration Company

"Drawing on massive amounts of background data collected from various experiments, we focused on providing the highest level of safty. Our aim is to make the natural fluid (HC) refrigerator the global standard."

Mobile Phones in Europe

Matsushita Mobile Communication Development of Europe Ltd. (MMCDE), a subsidiary of Matsushita Communication Industrial Co., Ltd. (MCI), designs and develops mobile phones primarily for European markets. The company is working to upgrade the phones' basic performance as well as their environmental performance while minimizing cost.

Thorough Implementation of the Matsushita Product Assessment

MCI makes extensive use of the Matsushita Product Assessment Version 5 – a tool designed to assist manufacturing of highly recyclable products– to evaluate environmental impact from the product design stage onward. As a result of the assessment, energy load during product use and production of components were identified as the areas that needed to be addressed. A further study on the energy conservation of products found that the crux of the problem was standby power consumption when the battery charger is in use. Accordingly, they worked on product design, focusing on improving charging efficiency, and was subsequently able to attain the 2005 target established for the European external power efficiency standard two years earlier than originally planned. Furthermore, the energy use index of the FY 2001 model has been dramatically improved by as much as 3.5 times that of the FY 1998 model.

Steady Efforts for Improvement

MMCDE is striving to minimize the number of components used in its mobile phones in order to reduce environmental loads exerted by its component manufacturing operations, identified as a problem area in product assessment. It is also working to improve resource use efficiency through the reduction of the size and weight of its phones.

Weight of the FY 2001 model (GD75) has been reduced to 82 g, which is about 53% lighter than the FY 1998 model's (G450) 170 g.

The company will begin use of lead-free solder with the FY 2002 model, GD67. It is also making efforts to replace brominated and chlorinated flame retardants with environmentally friendly substitutes.

Mobil phones
GD75

Gareth Rice
Matsushita Mobile Communication Development of Europe Ltd.

"We consider environmental conservation as one of our most important tasks. Although there is more to be done, this first step lays a solid foundation for the manufacturing of clean and environmentally friendly products."

Shift to Green Distribution

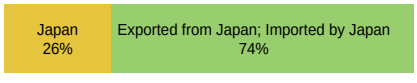
Distribution, which involves delivering manufactured products to consumers, is an important part of business activities. Meanwhile, increases in the amount of CO_2, NOx (nitrogen oxides) and suspended particulate matters emitted primarily from automobiles have sparked concerns about their adverse effects on people's health and the environment. Exercising environmental consideration on the distribution front is thus growing in importance. In its Environmental Vision, Matsushita declares its commitment to working toward green distribution, and has implemented measures that center on "promotion of modal shift" and "improvement of transportation efficiency." We will aggressively seek to reduce environmental loads in distribution activities, putting "promotion of introduction of low-emission vehicles" and "promotion of eco-driving," in addition to the two focus areas mentioned above.

Environmental Loads of Distribution Activities

Since FY 2001, we have been tracking CO_2 emissions and transportation amount incurred in the shipment of products from manufacturing sites to retailers. In FY 2001, total transportation amount to 3,389 million t-km, while CO_2 emissions totaled 407,000 t-CO_2. On the domestic transportation front, CO_2 emissions deriving from truck transportation accounted for 94% of total emissions. Thus, improving the transportation efficiency of trucks themselves and promotion of modal shift constitute important areas of challenge.

Transportation Amount and CO_2 Emissions (rough estimates)

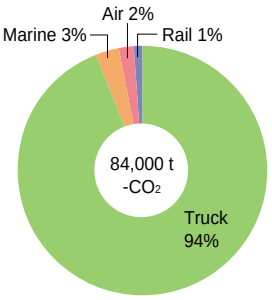
Transported: 3,389 million t-km



CO_2 emissions: 407,000 t-CO_2

(Notes)
- Transportation distance is partly estimated.
- Exports and imports include products and materials.

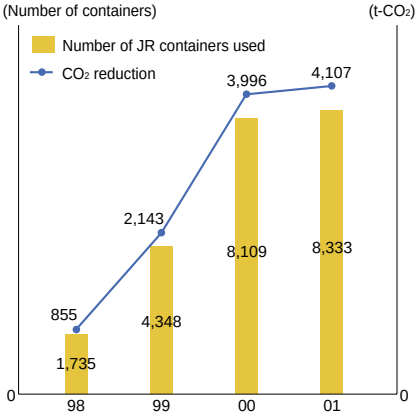
Domestic CO_2 Emissions by Mode of Transportation (component ratio)



A Drive toward a Modal Shift

For transportation over long distances exceeding 500 km, we are promoting utilization of railroads rather than trucks (modal shift), which contributes to the reduction of CO_2 and NOx emissions. For example, some of our electric home appliances, such as TVs, are brought in from overseas plants. When we move them over long distances from the port of arrival to various parts of the nation, we rely on railroads. During FY 2001, the total number of JR containers used by the Matsushita Group reached 8,333 (on a 5-ton container basis), representing an emission reduction of 4,107 t-CO_2 when compared with equivalent truck transportation.

Reduction in CO_2 Emissions Achieved by the Modal Shift



(Notes)
- The number of JR containers is calculated on a 5-ton container basis.
- Part of the calculated reduction in CO_2 emissions is an estimate.
- As a result of a reexamination conducted to improve accuracy, some of the data up to last year have been revised.

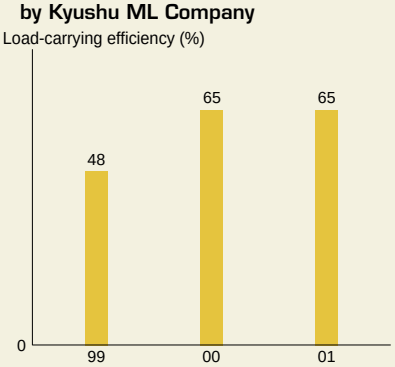
TOPICS

Improvement of Transportation Efficiency through the Vehicle Operation Control System

Kyushu Matsushita Logistics (ML) Company

Kyushu ML Company of Matsushita Logistics Co.,Ltd. plays an important role in delivery of Matsushita products to retailers throughout the Kyushu area. The company provides sophisticated regional delivery service through its two transportation hubs and 14 transshipping sites. Working toward the objective of "ensuring on-time delivery to retailers and improving transport efficiency to contribute to both the environment and management of the company," Kyushu ML Company was quick to introduce a vehicle operation control system in FY 1999.

Improvement of Delivery Efficiency by Kyushu ML Company



Kyushu ML Company's delivery vehicles and on-board system

The system has enabled the company to accurately grasp and log information about the operating status of the delivery vehicles, such as delivery location arrival and departure times, travel distances and changes in vehicle speeds. Based on these data, the company has optimized delivery routes and eliminated redundant vehicles, thereby significantly raising load-carrying efficiency.

Matsushita Logistics will pursue gradual introduction of the system in other regions as well.

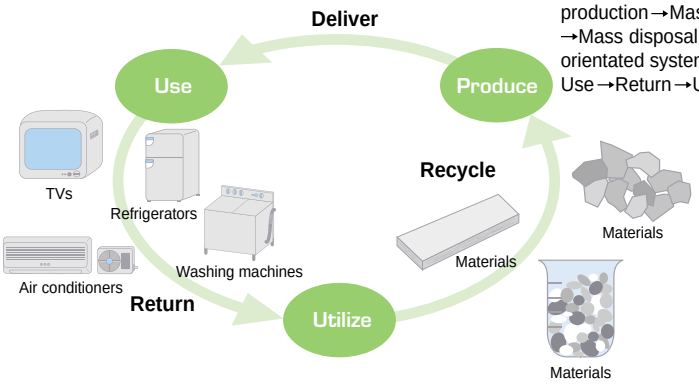
Recycling of End-of-life Products

Efforts to recycle end-of-life products are being made worldwide. We have developed a system that allows them to be recycled as resources, and in Japan we put the system into operation in April 2001. Our endeavor centers on both the recycling of end-of-life products and development of highly recyclable products.

Matsushita's Home Appliance Recycling System

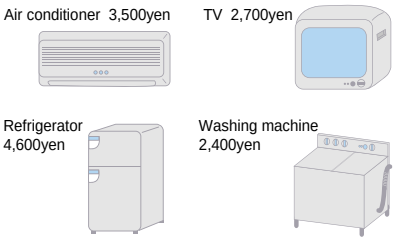
In order to realize the systems aimed at by Home Appliance Recycling Law and enlist the cooperation of society and our business partners, it is vital that we minimize recycling costs. We have created an efficient decentralized processing system that makes use of existing infrastructure and works in concert with carriers and recycling business operators. At present, we are focusing on the collection and recycling of TVs, air conditioners, refrigerators and washing machines–the four products designated by the Law. Under a commission from the manufacturers (19 companies) who participate in Matsushita's home appliance recycling network, we undertake total operations related to recycling of home appliances on their behalf, facilitating the operation of a nationwide network of 27 recycling centers and 190 designated collection points.

Recycling-Oriented Social Systems



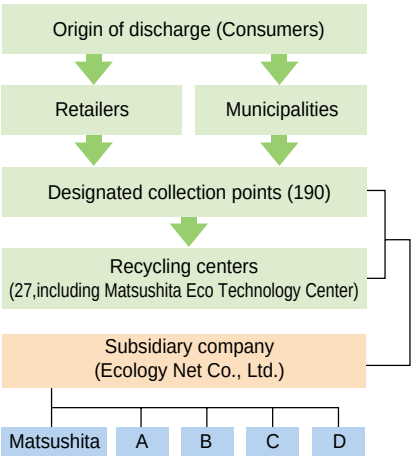
From a social system of Mass production→Mass consumption →Mass disposal, to a recycling-orientated system of Produce→ Use→Return→Utilize

Recycling Fees



Notes: Consumers pay the total of 1. fees paid to a company or municipalities for collecting and transporting the end-of-life product, and 2. fees paid to a manufacturer for recycling.

Matsushita Home Appliances Recycling System



DATA Recycling of End-of-life Products ➡ p.59

Home Appliance Recycling Law

In Japan, the Home Appliance Recycling Law came into force on April 1, 2001. Obliging manufacturers and importers to undertake product recycling, the law was a landmark move that had a worldwide impact. The law's main features include: (1) placing an obligation on businesses to reduce costs through market competition, (2) placing an obligation on retailers to collect and deliver home appliances for recycling, and (3) assigning recycling expenses to those who dispose of appliances. Air conditioners, TVs, washing machines and refrigerators together account for about 80% of the weight of all electric home appliances disposed of by households. Because home appliances contain many useful resources such as metals and glass, the recycling law mandates effective recycling and reuse of resources recovered from used home appliances.

Four Target products and Their Recycling Rates

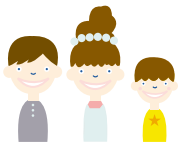
Air conditioners 60% or higher	TVs 55% or higher
Refrigerators 50% or higher	Washing machines 50% or higher

Recycling rate = (Reused component and material mass / Product mass) x 100

Responsibility based on the law

Origin of discharge

When disposing of the appliance, users take responsibility for the recycling cost, including collection and transportation costs.

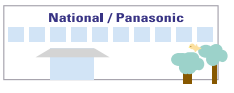


Retailers

Retailers have an obligation to collect end-of-life products for these four specific kinds of products sold to consumers.

Manufactures and importers

Manufactures and importers are obliged to collect and recycle their own products. They must achieve the basic recycling rate set for each of products. Further, they are obliged to recover and reuse or decompose refrigerant form air conditioners and refrigerators.

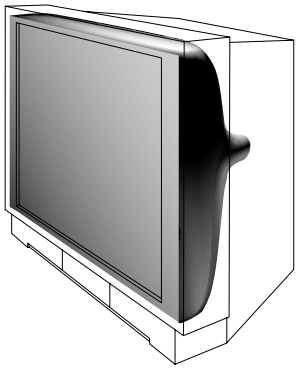


Matsushita Eco Technology Center (METEC)

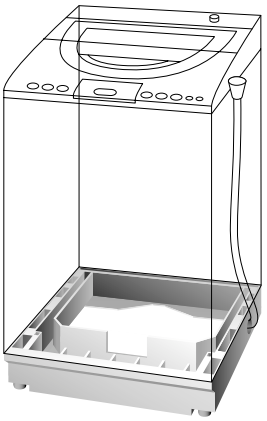
In 2000 we established the Matsushita Eco Technology Center in the science park in Yashiro-cho, Hyogo Prefecture, which went into operation in April 2001 as an R&D and testing center of home appliance recycling. Besides recycling the four legally designated home appliances collected from the six prefectures of the Kinki district, the Center is engaged not only in researching ways to use scrapped materials in new products but also in development of highly recyclable products, following a concept of "making new products from end-of-life products." Made open to the public, the Center received some 9,000 visitors during FY 2001.

Matsushita Eco Technology Center (Japanese only)
http://www.matsushita.co.jp/environment/metec/

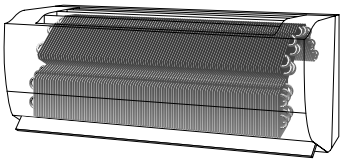
Examples of Using Scrapped Materials in New Products

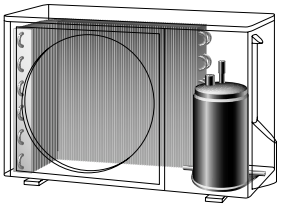


TVs
Glass recovered from cathode ray tubes (CRTs) is used again as a material for new CRT glass.

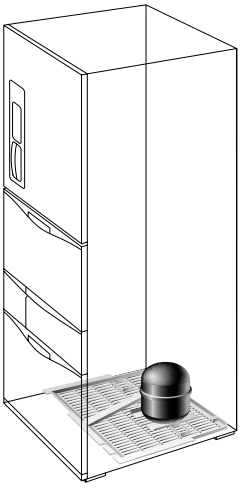


Washing machines
Recycled plastics are used to make the base frame of washing machines.



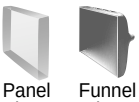
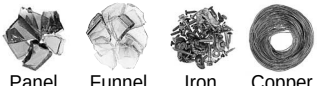
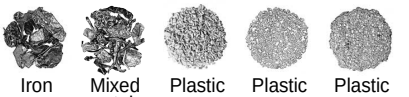
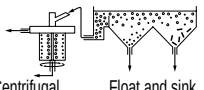


Air conditioners
Recovered copper and aluminum are used to make heat exchangers of indoor and outdoor units.
Cast iron is recycled to make components of a compressor for the outdoor unit.



Refrigerators
We are currently researching the use of recycled plastics for the base plate of refrigerators and cast iron for components of compressors.

Recycling Technologies for Four Electric Home Appliances

Recycling efforts			
Major steps of dismantling and separation into parts		Proprietary technology	Major resources recovered*2
TVs 	Recycling of glass recovered from a CRT, which accounts for about 57%*1 of the weight of a TV	The CRT of a TV set consists of two kinds of glass: the panel glass (front) and funnel glass (rear). To recover high-purity glass, we have developed Matsushita's own CRT glass crushers and washers, and are pushing forward with their introduction at recycling plants throughout the nation.  Panel glass, Funnel glass	 Panel glass, Funnel glass, Iron, Copper
Refrigerators 	Recycling of metals and plastics Recovery of CFCs	After the refrigerant CFCs are recovered, the compressor unit is separated into parts. Reuse of key product components is being explored in our research and study. We began recovering CFCs from insulation foam voluntarily. We are now working on reusing urethane foam insulation.	 Iron, Mixed metals, Plastic (Polypropylene), Plastic (Polystyrene), Plastic (Polyurethane)
Washing machines 	Separation of polypropylene (PP) from other plastics for reuse	PP (polypropylene), which makes up a majority of the plastics used in washing machines, is recovered with a great degree of purity through the centrifugal force separation technology developed by Matsushita, a technique that separates plastics according to differences of their specific gravity. Flow of plastic separation  Centrifugal gravity separation, Float and sink gravity separation	 Iron, Mixed metals, Plastic (Polypropylene)
Air conditioners 	Metals with high component ratio are recovered with a high degree of purity. Recovery of CFCs	We have developed a system that recovers metals such as copper and aluminum in high degrees of purity from heat exchangers through the vibration gravity separation method. Another development is the technology of crushing sturdy compressors under room temperature, which allows us to recover cast iron material.	 Iron, Cast iron, Copper, Aluminum

*1 1982 models; based on data compiled by the Association for Electric Home Appliances *2 Recovered resources are mixed with virgin materials and reused as materials for new products.

Environmental Risk Management

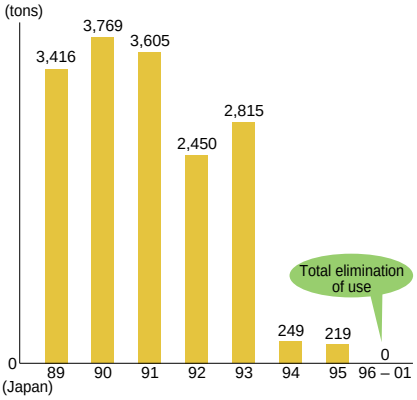
Corporate business activities entail a variety of potential environmental risks. We regard environmental contamination caused by harmful chemical substances as the most serious of all. This is why we conduct comprehensive management of chemical substances to evaluate the risk of each of the chemicals that require management, and, based on the evaluation results, take steps to eliminate or reduce the use of high-risk chemicals. For those chemicals that are difficult to replace with substitute materials or render harmless at the present time, we exercise preventive control against accidental environmental pollution during normal operations as well as in emergencies, in accordance with the Environment Pollution Prevention and Management Manual, which represents our cumulative knowledge in this area.

Conservation of Soil and Groundwater

Elimination of the Use of Volatile Organic Compounds

Because of their outstanding properties as detergents, VOCs (volatile organic compounds) have been our choice to clean components. With the aim of lessening environmental risks however, we set to work toward the prevention of contamination and reduction in usage of these compounds. In 1989, we decided that we must not allow the compounds' infiltration into groundwater and in 1991, prepared the Manual for Preventing Contamination of Soil and Groundwater. Using the Manual for guidance, we conducted contamination surveys and implemented restorative measures.

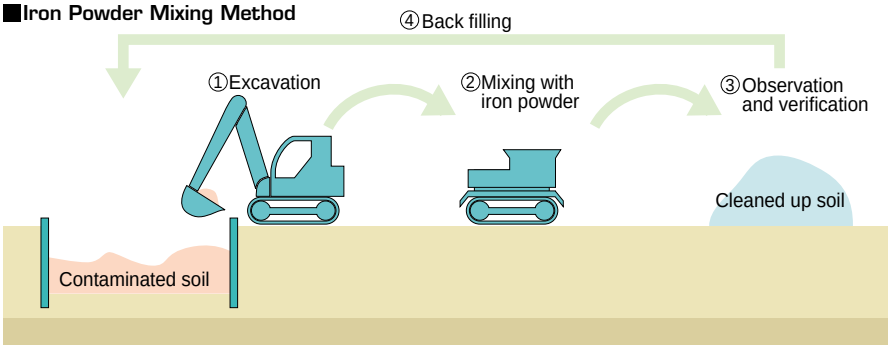
Use of VOCs as a Detergent



Restorative Activities at Operation Sites that Failed to Meet the Standards

In June 1998, based on voluntary notification from Matsushita, local governments announced incidents of groundwater contamination caused by VOCs that had occurred at 20 of Matsushita's operation sites in Japan. We immediately established the "Team for the Accelerated Implementation of Groundwater Pollution Countermeasures" and conducted thorough investigations and speedy implementation of countermeasures. In compliance with the Operational Criteria for Guidelines for Surveys and Measures for Soil and Groundwater Pollution (published in January 1999 by the Environment Agency), we examined data, surface gas, soil and groundwater. Operation sites that were found to exceed the standards are making cleaning-up and restoration efforts, acting on consent from local government agencies and employing such methods as groundwater pumping, vacuum gas extraction, soil excavation, and iron powder mixing. In the case of groundwater pollution, we have taken countermeasures with the highest priority placed on preventing substances from leaking from the site premises. We therefore bored monitoring wells on the site boundaries. We will strive to accelerate the restoration work by adopting cutting-edge clean-up technologies, while continuing to monitor groundwater even after the restoration work is completed.

Iron Powder Mixing Method




① Soil is excavated with planks inserted.


② Iron powder is mixed with excavated soil.


③In the presence of representatives from local government, verification is made that the standards are met.


④ Excavated soil is put back.

Countermeasures to Offset the Environmental Impact of VOCs

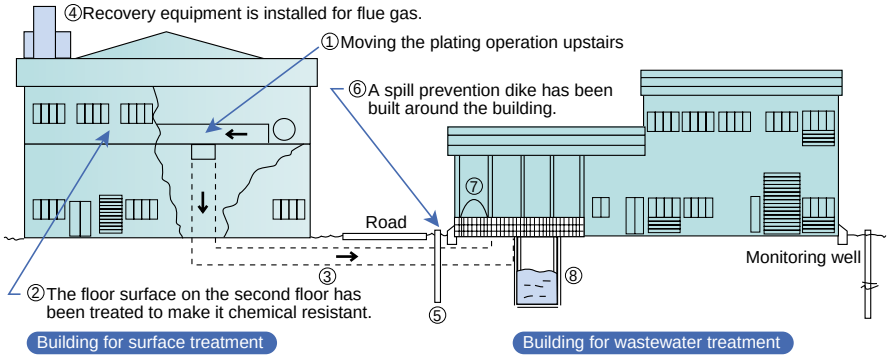
Site	Status	Restoration method*1
Hokkaido Matsushita Electric Co., Ltd.	Clean-up underway	A, B
Arai Site, Semiconductor Company	Restored to acceptable standards*2	
Wakasa Matsushita Electric Co., Ltd.	Restored to acceptable standards*2	
Takefu Matsushita Electric Co., Ltd.	Clean-up underway	A, B
Kusatsu Site, Air-Conditioner Company	Clean-up underway	A, B
Kameoka Site, Toyo Dempa Co.	Clean-up underway	A, B
Takatsuki Site, Matsushita Electronic Instruments Corp.	Clean-up underway	A, B, C
Moriguchi Site, Matsushita Electronic Component Co., Ltd.	Clean-up underway	A, E
Moriguchi Site, Matsushita Battery Industrial Co., Ltd.	Clean-up underway	A, B
Nara Site, Home Appliance & Housing Electronics Company	Clean-up underway	A, B
Tsuyama Matsushita Electric Co., Ltd.	Clean-up underway	A, B, E
Kagawa Matsushita Kotobuki Electronics Industries, Ltd.,	Clean-up underway	A, B
Wakimachi Site, Matsushita Kotobuki Electronics Industries, Ltd.	Clean-up underway	A, B, C, D
Matsuyama Site, Matsushita Kotobuki Electronics Industries, Ltd.	Restored to acceptable standards*2	
Oosu Site, Matsushita Kotobuki Electronics Industries, Ltd.	Clean-up underway	A, B
Oita Site, Kyushu Matsushita Electric Co., Ltd.,	Clean-up underway	A, B
Kikusui Site, Kyushu Matsushita Electric Co., Ltd.	Restored to acceptable standards*3	
Taimei Site, Kyushu Matsushita Electric Co., Ltd.	Restored to acceptable standards*3	
Miyazaki Matsushita Electric Co., Ltd.	Clean-up underway	A
Kagoshima Matsushita Electric Co., Ltd.	Clean-up underway	A, B

*1 Major restoration methods
A: Groundwater pumping method B: Vacuum gas extraction method C: Iron powder mixing method
D: Groundwater pumping method using a horizontal well E: Soil excavation method
*2 Continue monitoring *3 After verification by the local government, switch to monitoring.

Preventive Measures

Preventing pollution is a vital aspect of risk management. To ensure pollution prevention, Kyushu Matsushita Electric Co.'s Oita Plant has made a variety of improvements to its buildings and facilities.

Examples of Pollution Prevention Measures



③Plumbing inside a pit

Underground plumbing is suspended inside a pit, the surface of which is treated with chemical resistant material. In case of pipe damage, this structure prevents the leaked liquids from infiltrating the soil.

⑦Installation of a spill prevention dike around chemical storage tanks

In the event of a chemical spill while the tank is being replenished, the dike serves as a wall to contain the spilled liquids, and preventing them from infiltrating the soil.

⑤Installation of a well for monitoring leakage from the underground tank

⑧Installation of emergency tanks against accidental leakage from chemical storage tanks

Environment Pollution Prevention and Management Manual

We have prepared a manual that stresses the importance and key points of preventive measures and provides emergency procedures, highlighted by descriptions of accidents that have occurred or been prevented in the past. We are making sure the contents are communicated to and understood by employees at all operation sites.

Environment Pollution Prevention and Management Manual distributed to all operation sites

Prevention of Dioxin Pollution (Discontinuation of Incineration)

In February 1998, Matsushita adopted a policy of totally eliminating its incinerators. Since then, we have been working toward this goal, in conjunction with the implementation of measures aimed at zero emission, such as recycling and thorough separation of waste. As of the end of FY 2001, 77 incinerators out of the 79*4 that were in use up until 1998 have been decommissioned. As for the remaining two incinerators, we have reduced the risk of pollution by making certain that they meet the 2002 standards set by the Law Concerning Special Measures against Dioxins, and utilizing exhaust heat from them as well.

*4 From FY 2001 on, the number includes incinerators owned by Victor Co. of Japan, Ltd.

Storage and Treatment of Electronic Devices that Contain PCBs

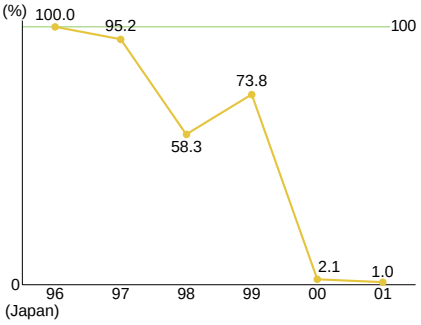
In the past, PCBs (polychlorinated biphenyl) were used as insulating oil in electric capacitors, transformers and ballasts for fluorescent lights. Because this substance does not decompose easily and the process to render it harmless is still under development, we are currently storing used electronic devices containing PCBs, exercising the utmost care that no PCBs leak or scatter in the air. While we continue to store PCB-containing devices, we will immediately formulate a plan for rendering this substance harmless and strive for its implementation.

Reduction in Emissions of Hazardous Air Pollutants

Following the guidelines issued by the Ministry of Economy, Trade and Industry and the Voluntary Management Plan for Hazardous Air Pollutants prepared by the electric and electronics industries, we collect data on the use pattern and emissions of hazardous air pollutants, with the objective of restricting emissions. In FY 1999, we completely eliminated the use of chlorinated organic solvents (a solvent used for coating) in Japan. As a result, hazardous air pollutants emitted in FY 2001 decreased sharply to 1.0% of the FY 1996 level. We will seek to gradually reduce the amounts of hazardous air pollutants currently used or emitted by our R&D divisions.

Emissions of Hazardous Air Pollutants

(compared to FY 1996 level)



Research and Development

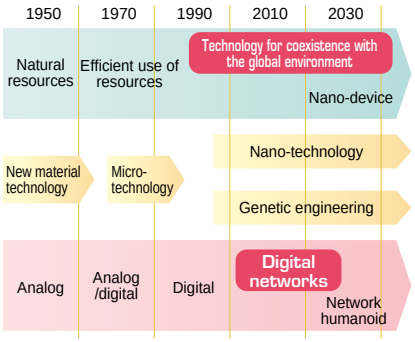
Matsushita's R&D divisions consist of about 36,000 engineers responsible for a wide range of activities, from advanced research to product design. About 540 billion yen is spent annually on research and development of new products and their elemental technology, and on creation of system solutions based on them. To deal with environmental issues, the Living Environment Development Center and Environmental Production Engineering Laboratory have been established for the research and development of Group-wide technology in the fields of appliances and the environment.

Growth Strategy for R&D

We believe that the major technological trends in the early 21st century will be the growth of technologies supporting coexistence with the environment and digital networks, and these will lead to growth in the fields of "networked home appliances" and "environmental and health-related appliances." Networked home appliances are not confined to conventional indoor use; our business opportunities are being expanded to networked outdoor (mobile) products and vehicles. Environmental and health-related appliances are centered on the household fuel cell cogeneration system and other systems of appliances and environmental equipment. With our emphasis on strategic devices and semiconductors that serve as the basis of these two emerging fields and system solutions for realizing a new living environment, we promote the research and development of advanced technology, including nano-technology for producing new materials and devices.

We have also established the R&D Structure According to the Strategic Product Groups, focusing on the development of strategic products and core technology, thereby accelerating and strengthening priority themes through the efficient use of Matsushita's R&D resources.

■Technological Trends in the Early 21st Century



■R&D Structure According to the Strategic Product Groups

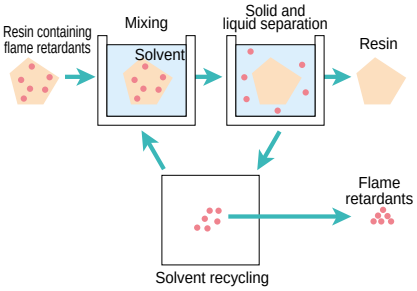
- Digital TVs
- Home AVC servers
- Mobile AVC
- Mobile communications
- Automotive electronics
- Home gateway
- Color printing
- Home appliances networking
- Fuel cell cogeneration systems
- Home utility infrastructure
- Mobile components and devices
- Circuit devices
- Rechargeable batteries
- Display devices
- Lighting devices
- Strategic semiconductors
- Professional AV systems
- AV surveillance systems
- Thermal Affordance Systems
- Fluid-dynamic bearing motors

R&D in the Environmental Field

Material Recycling Technology for Flame Retardant Resin

Resin is one the more difficult materials to recycle from end-of-life products because of the use of diverse additives. Flame retardants, in particular, are additives indispensable for ensuring safety when electrical appliances catch fire, but resins containing certain types of flame retardants are known to cause such problems as emission of dioxin when incinerated. Thus, we have been conducting R&D of recycling technology for safely separating flame retardants from used resins. This technology employs a solvent that dissolves only flame retardants from resins, and the solvent can be repeatedly used. Properly disposing of separated flame retardants makes it possible to build material recycling systems with a minimum environmental load.

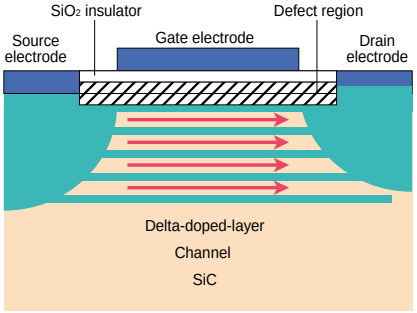
■Flame Retardant Separation Process



Development of the SiC Power Device

One of the nanotechnology (one nanometer = one millionth of a millimeter) development themes we are promoting is the SiC power device. This power device (MOS-FET) employs technology for fabricating the world's first nano-sized layered structure (delta-dope structure), which was developed by Matsushita as the channel structure on the compound-semiconductor SiC, enabling the control of large amounts of current. Power devices are generally used in inverter circuits for power on/off switches in home electric appliances such as air conditioners and refrigerators, and most of the power consumed by these products pass through the power device. While 5-15% of power is lost as heat with conventional silicon power devices, SiC power devices cut power loss by half (2-7%). Use of this product in inverter circuits is expected to contribute to substantial energy savings in home and office equipment.

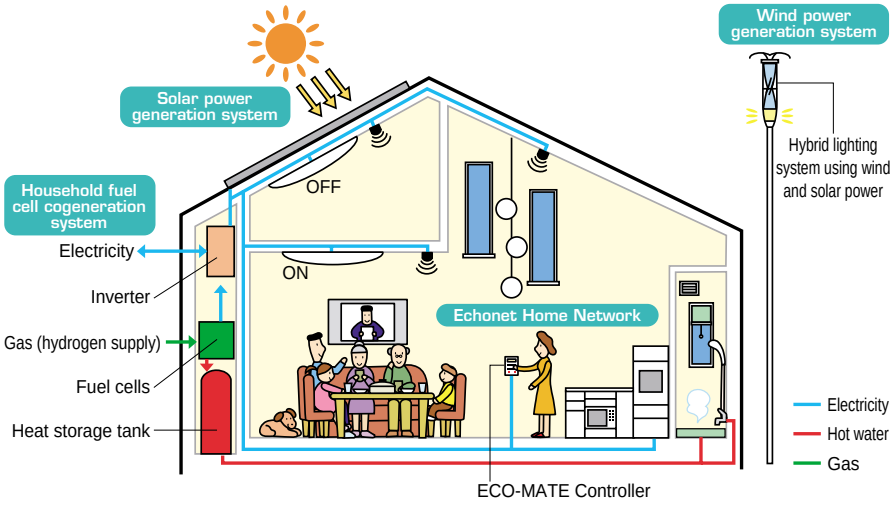
■Nano-sized Delta-dope-layered Structure



Environmental Solution Business

In our Environmental Vision, we have set forth Environment and Energy Business Initiatives. Taking advantage of our experience in manufacturing technology, and with newly developed environmental technology, we hope to contribute to building a sustainable society through our business. The mainstay of these initiatives is a business dedicated to energy conservation and creation to prevent global warming. Various projects are being promoted as life at home, and transportation and urban planning. In FY 2001, we have successively launched a series of projects aimed at effective use of resources based on product recycling.

■Home Life for a Sustainable Society



Energy Conservation and Creation Business

●Wind Power Generation System

Wind power generation is attracting attention as clean energy. Matsushita Seiko Co., Ltd. has been developing a Savonius-type blade, which rotates at a low wind velocity of 2.5 m/s, enabling power generation regardless of wind direction. Its low-noise and safety guard features make it ideal for installation in urban areas. In FY 2001, *"Kazekamome,"* an independent power lighting system that can be used as a streetlight, operated by a hybrid power generation system using both wind and solar power, was commercialized.

"Kazekamome," the name and shape inspires an image of a seagull with spread wings.

URL Wind power generation system (Japanese only)
http://www.msc.panasonic.co.jp/html/20/20_index.htm

●Household Energy Management System Echonet Home Network

Echonet is a standard for the next-generation home network system that realizes home energy-savings and home healthcare needed in the aging society. Matsushita Industrial Equipment Co., Ltd. is undertaking the standardization and technology development of this system.

Specific tasks include development of a communication system using existing home electrical wiring, eliminating the need for wiring, and commercialization of related equipment, such as the communication module and controller. Network appliances will also be developed.

In FY 2001, we participated in the Home Energy Management System Project conducted by the New Energy and Industrial Technology Development Organization (NEDO), and jointly established a new company named EL-Quest Co., Inc. with The Kansai Electric Power Co., Inc. and Hitachi, Ltd. A three-year verification test has been initiated to introduce the Echonet home network into households.

ECO-MATE Controller displays the result of energy savings in the amount of money saved.

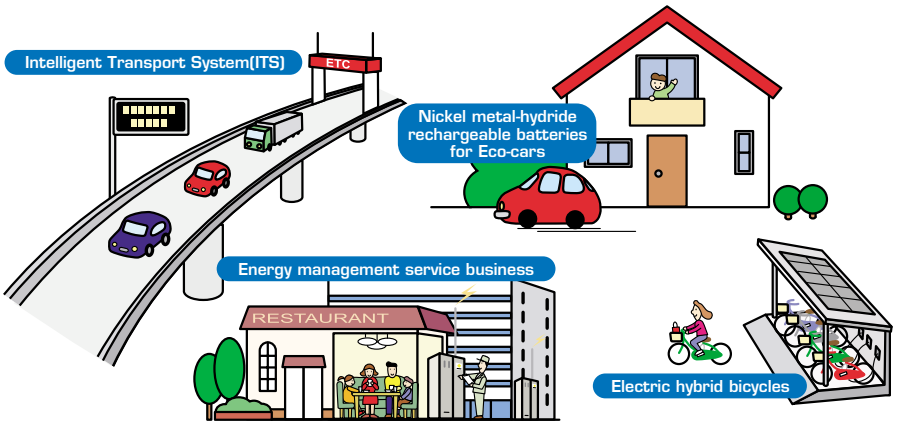
URL Echonet Consortium
http://www.echonet.gr.jp/english/index.htm

●Fuel Cell Cogeneration System

Fuel cells generate electricity through reaction of hydrogen and oxygen. Emitting no CO_2 or toxic substances, they are attracting attention as decentralized clean generators. Among the four main types of fuel cells, Matsushita is undertaking the research and development of solid polymer electrolyte fuel cells (PEFCs), which operate even below 100℃ and are suitable for home use that requires frequent power on/off operations. A cogeneration system makes effective use of heat, which is generated with electricity, for supplying hot water. With this system, energy efficiency can be doubled over that of thermal power generation, helping reduce CO_2 emission. In FY 2001, the fuel cell cogeneration system was demonstrated at the Environmental Forum, showing the many visitors how it supplied power and hot water. We are aiming at the full-scale marketing of the system in FY 2004 by further improving its durability and reducing costs.

Household Fuel Cell Cogeneration Systems

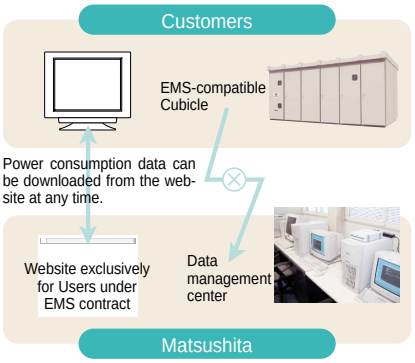
■Transportation and Urban Planning for a Sustainable Society



●Energy Management Service Business

In order to reduce energy consumption and curtail expenditure on energy in plants and commercial facilities, it is necessary to monitor energy use numerically. In response to such needs, Matsushita Power Distribution Systems Co., Ltd. is providing an energy management service (EMS). This service collects data on energy use at plants and shops using various measuring tools combined into a monitoring system. Measuring tools include power-monitoring units for Cubicle type power distribution equipment, and multi-circuit type electric power monitors for high-energy consumption facilities such as air conditioners. Data is transmitted to our data management center via public telephone lines, and customers can readily check details on their energy use from the EMS website. Furthermore, as part of our consulting service, collected data is analyzed to determine the optimum control system required, based on the customer's consumption trends.

■Transmission of Electricity Management Data via Internet



●Nickel Metal-Hydride (NiMH) Rechargeable Batteries for Eco-Cars

Electric vehicles without exhaust gas, and hybrid vehicles powered by combining an electric motor and a combustion engine to improve fuel efficiency and realize low emissions, are attracting attention as effective means for solving global warming, air pollution, depletion of petroleum resources, and other global environmental issues. In 1996, Toyota Motor Corporation, Matsushita Electric Industrial Co., Ltd., and Matsushita Battery Industrial Co., Ltd. jointly established Panasonic EV Energy Co., Ltd. for the development, manufacturing, and marketing of nickel metal-hydride (NiMH) rechargeable batteries and battery-related control equipment for PEVs and HEVs. Ni-MH rechargeable batteries for HEVs were adopted in the world's first HEV PRIUS in 1997, and were additionally used in the INSIGHT in 1999, and the ESTIMA HYBRID and CIVIC Hybrid in 2001.

URL **Panasonic EV Energy Co., Ltd.**
http://www.peve.panasonic.co.jp/e_top.html

●Intelligent Transport System (ITS)

Efficient transportation systems make it possible to contribute to the environment by alleviating traffic congestion, reducing CO_2 emissions, and improving fuel efficiency. Using our information and communication technology, we are promoting the research and development of the Intelligent Transport System (ITS), including the Electronic Toll Collection (ETC) system. Projects for intelligent navigation and emergency reporting systems are also being implemented.

●Electric Hybrid Bicycles

Bicycles are regaining popularity as a noise and pollution-free means of transportation and leisure activity. Electric bicycles, in particular, are attracting attention for use on slopes and by the elderly. National Bicycle Industrial Co., Ltd. developed an electric hybrid bicycle in FY 1996. Now the company promotes businesses that are linked to community building, such as the Eco-Cycle System, in which electric bicycles are shared by commuters, who currently ride individually owned bicycles to work and school.

Electric hybrid bicycles for newspaper delivery adopted by Kochi Shimbun

TOPICS

Eco-Bicycles, Not Ego-Bicycles

Bicycles are also linked with such social problems as theft and illegal parking. National Bicycle Industrial Co., Ltd. decided it was their mission as a bicycle manufacturer to solve these problems. First, it sought to create a bicycle that cannot be stolen, or if stolen, that will not move, and developed a new system called *Gacharinko*, which double locks the saddle and stand. In addition to achieving a theft prevention rate of 99.7%, it introduced the company's unique Two-Year Theft Compensation System. Bicycles tend to be illegally abandoned and end up as bulky garbage when they become rusty. With hope that users ride their bicycles with affection as long as possible, *Hearth* standards were established. Materials were switched from iron to stainless steel and aluminum to prevent rust, and PVC was eliminated from saddles and grips to prevent dioxin emission upon disposal. Hoping to raise environmental consciousness among the young, bicycles with the *Hearth* specifications are promoted particularly as school commuter bicycles.

Hearth, coined from heart and earth, embodies our wishes for consideration of the environment and cherishing valuable resources through bicycles.

Businesses Contributing to Effective Use of Resources

●Magnesium Alloy Components

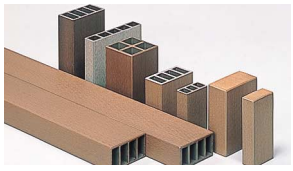
Magnesium is lightweight, strong, highly recyclable, and found in abundance on the earth. Because of these environment-friendly features, since 1998, we have adopted magnesium as a new metal material for replacing plastic materials used in TVs, portable MD players, and other products. In August 2001, Matsushita Fujisawa Manufacturing Center began full-scale production of magnesium alloy components. Currently, the use of magnesium has expanded to portable DVD players, digital still cameras, mobile phones, and notebook computers. An integrated manufacturing system, from R&D to mass production of various components, has been implemented to improve cost performance and product competitiveness.

Portable DVD players

Magnesium alloy molding line

●MK-MWood, 100% Recycled Synthetic Wood

Matsushita Kotobuki Electronics Industries, Ltd. has succeeded in the commercialization of MK-MWood, synthetic wood combining waste plastics from within and outside the company and waste wood from lumber mills. Wide-ranging businesses from materials to secondary processing are being promoted by fully utilizing the company's technology for woodworking, tooling, and molding.



With an appearance resembling natural wood, MK-MWood is also weather-resistant and recyclable.

●Low-Cost, High-Precision Recycling System

In response to demands for a low-cost recycling system for printed circuit boards, we have developed the Parts Separator System. This system features a rotary shock separator for recovering high-purity metals, a maintenance-free simple design, minimum energy required for recycling, and low cost. While larger systems require tens and hundreds of million yen in investment costs, this system has been delivered to recycling operators and nonferrous refineries at approximately 20 million yen.

Parts Separator System

●Solder Recycler Using Sesame Seeds

A unique solder recycler using sesame seeds has been developed. Conventionally, solder dross generated in the process of soldering has been disposed of as industrial waste. However, it was discovered that by sprinkling sesame seeds and stirring, reusable solder could be separated from powdered metal oxides, resulting in a practical method of solder recycling. As lead-free solder is known to produce more dross compared to conventional solder, this new recycler plays a great role in soldering.

Solder recycler

TOPICS

High-precision Plastic Separator, Pla-selector

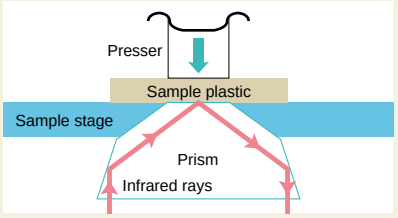
The main problem in the recycling of used TVs is distinguishing and separating the plastic parts. Dark colors, flame retardants, paint, stain, and other factors contribute to difficulty in separation. Hiroshi Iwamoto of AVC Development Center, AVC Company was involved in the development of this high-precision separator.

Pla-selector
Testing of small punched samples has advantages of compact size and quick identification and separation.

●Plastic Separation of TVs Presents the Greatest Difficulty

While a small amount of additives improve the properties and functions of plastics, it makes their recycling difficult. Even a minute amount of an unexpected ingredient drastically reduces the strength. When recycling, collected parts must be separated at nearly 100% accuracy if they are to be used as recycled materials. Conventional separating methods were unsatisfactory due to inaccuracy caused by surface paint, stains, and scratches. By adopting the total reflection method, which presses the sample against a prism so that infrared rays are partially passed through, it became possible to check the cross section as well, creating a high-precision separator unaffected by the material surface condition. As a result of achieving nearly 100% accuracy, the percentage of recycled materials used in new components has been increased from the previous limit of 20% to 50%. We will continue to aim at perfection to produce new components from 100% recycled materials.

■Total Reflection Method of Spectroscopic Analysis



●Feedback from Recycling Process to Design

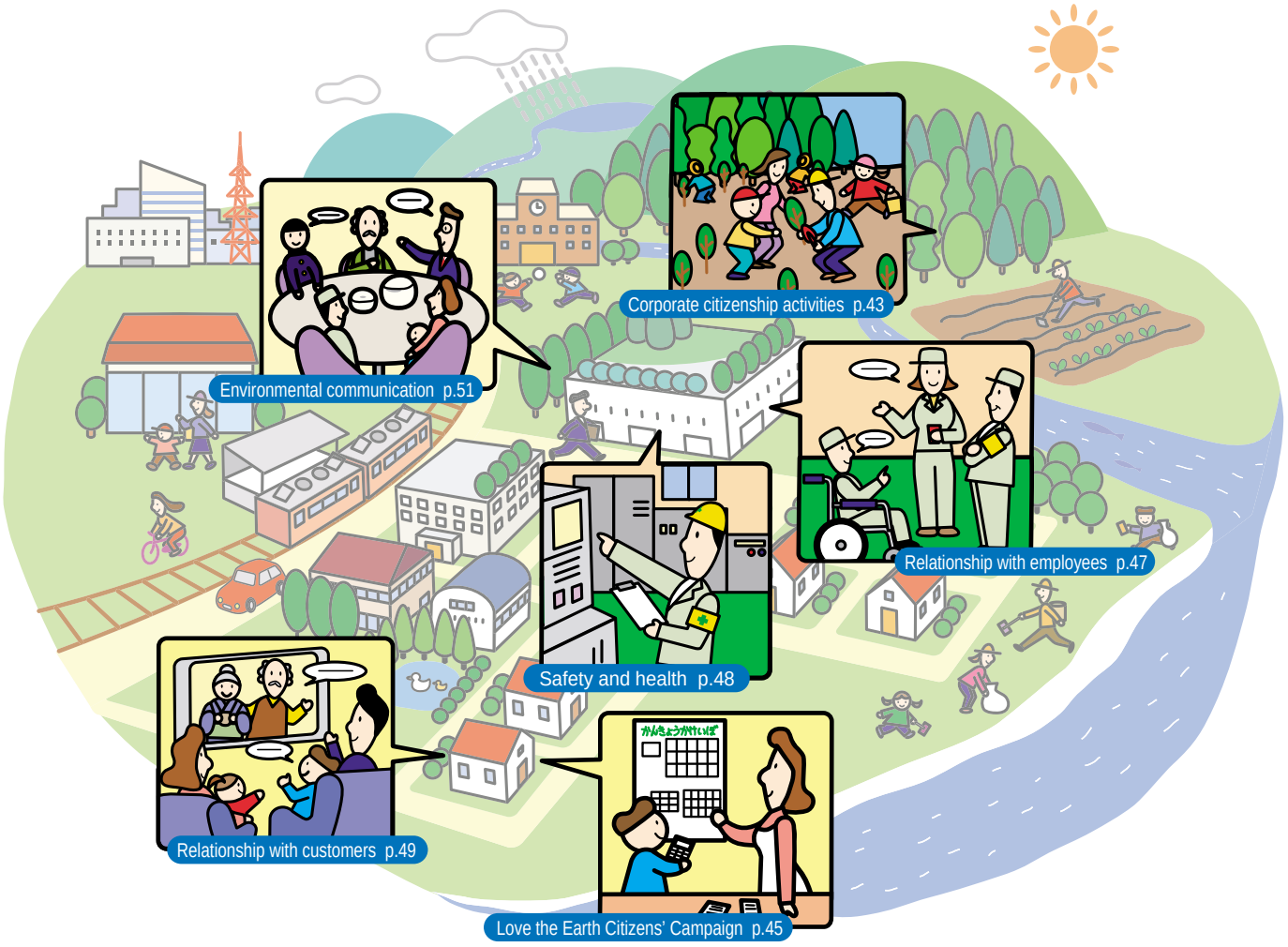
To facilitate recycling, consideration in the product design stage is important. "After observing disassembly and crushing of end-of-life products at the recycling plant and understanding what makes it difficult, I have passed on this lesson to the engineers in product design." Plastics collected using this recycler began to be used in TVs sold in December of 2001. We also plan to market the system starting in FY 2002.

Hiroshi Iwamoto
Device Technology Unit
AVC Development Center,
AVC Company

We are discussing the ever increasing importance of recycling-conscious design with design engineers.

Relationship between Our Business and the Society

■Commitment to People through Business Activities



●A Business – a Public Entity Entrusted by the Society

A company is entrusted by the society with valuable resources, such as people, materials, and capital, to carry out business activities. Even if a company is privately owned, it must carry out its business activities with the principle that "a business is a public entity entrusted by the society." Matsushita's corporate philosophy is to aim at the progress and development of society and the enhancement of quality of life throughout the world through the electronics business. We believe that only when a business properly carries out activities that contribute to the development of the society utilizing the resources entrusted by the society, can it be compensated in the form of profits as a reward for its social contribution. Furthermore, part of these profits is returned to the society through taxation.

●Three Aspects – Social, Environmental, and Economic

"People," "materials" and "capital" entrusted by the society for our business activities are key elements in the "social," "environmental" and "economic" aspects of our activity in pursuit of sustainable development. In the social aspect, we employ many "people" who are members of the society, provide them with the place to work, and support their livelihood. In the environmental aspect, we utilize many "materials" to create a wide array of products and services, exerting a huge burden on the environment in the process. And finally in the economic aspect, we efficiently utilize the "capital" invested by many people to make reasonable profits and contribute our gains to better the life of people through tax payments and the distribution of dividends to shareholders.

●Commitment to People through Business Activities

In this Social Responsibility section, we introduce our beliefs and activities in relation to "people," the key to our business operations. Matsushita's employees place top priority on contributing to the society by making every effort to provide valuable products and services. An important mission of our company is to improve the capacity of employees through job assignments, bring out the best potential of every employee, and provide the venue for them to use their abilities for the betterment of the society. In addition to contributing to the society as a corporate citizen, Matsushita also seeks to raise the awareness of employees as global citizens so that they will actively shoulder responsibilities in their homes and communities.

Relationship between Our Business and the Society

Atsushi Murayama
Vice President
in Charge of Planning, Personnel, and General Affairs
Matsushita Electric Industrial Co., Ltd.

(Chairman, Love the Earth Citizens' Campaign Promotion Committee)

Acquiring the Values of a Global Citizen

This is the fifth year of the Love the Earth Citizens' Campaign, an unusual name for a corporate initiative. The initiative was launched to encourage our employees to adopt environmentally conscious lifestyles at home and in their communities as global citizens, to go hand-in-hand with their activities at the workplace. However, as the initiative's activities are closely related to the private lives of the employees, it can be said that these activities meddle into private affairs, making it very difficult for a company to promote them. By working closely with the Workers Union and supported by employee's voluntary activities, we are gradually expanding the scope of the campaign.

The initiative originated in the close relationship of Matsushita's business activities with the society. Until today, we have lived as we please and worked hard to better our lives. Tackling our environmental problems means that we must sacrifice some materialistic comforts on which we have depended and start a new culture of affluence built upon mankind's coexistence with the global environment. At Matsushita, as we make our living by using large amounts of energy and resources to manufacture and market industrial goods, it is only natural that we try doubly hard to minimize any damage that our business activities might bring to the global environment. Realizing the serious responsibility on our part, and with the hope to be a leader in this environmental effort, we mobilize the whole company to promote the initiatives throughout our business activities.

On the other hand, the core of our business is to deliver convenient products to customers and to enrich their lives. I believe that customers have the final say in determining the balance between convenient and affluent life and environmental concerns. In order to resolve environmental problems and to achieve sustainable development, it is extremely important to heighten environmental awareness among citizens. In this sense, citizens' activities may be the basis for all environmental activities. That the employees of Matsushita are becoming aware of the necessary balance between the environment and economic activities and taking the lead in becoming citizens awakened to ecological thinking holds equal or even more significance than the environmental activities carried out at the company. I believe that acquiring the values of a global citizen is a prerequisite for facilitating proper business activities in a rapidly globalizing business environment.

New Corporate Culture for the Global Age

Today, the whole society is interconnected by networks, and the world has become one. Business activities and environmental issues are intertwined in a single global marketplace. Traditional personnel systems and organizational frameworks that have supported business development until now are reorganized and the corporate culture is rapidly being transformed.

The new working style at Matsushita will be called "Work & Life Cycle," a reform led by the management to change the corporate culture. It proposes to create a good cycle between work and private life by encouraging an employee to not spend so much time on work but to cultivate a rich private life as an individual building strong ties with other members of the society.

The immense change in the business model is the background to our reform. Until now, our business model has been established in a monoculture premised on a single race of the Japanese, working under the same work ethics and male-dominant social systems. With this monoculture, standardized mass production was made possible – manufacturing and marketing high-performance products in large quantities and at low prices. This business model, however, has become outdated. From now on, we must shift to new business areas such as key device businesses, in which imitation will not suffice, as well as the services and business solution fields. The new, emerging services will not take shape without employees who can see the needs from the customers' perspective and who can share the consumers' feelings.

A Business Exists for the Society

No matter how the environment faced by Matsushita changes and how the values of the people who work here change, one thing that remains constant is our corporate philosophy that Matsushita exists for its customers. We believe that our true contribution to the society can be made through fulfilling our responsibility as industrialists – to make ourselves useful to the society by providing products and services that please customers.

We have a firm belief that our mission is to contribute to the development of a society that coexists with the environment with diverse personalities and values unified by our corporate philosophy.

Corporate Citizenship Activities

In addition to our mission as an industrialist in bringing satisfaction to customers throughout the world through business activities, we also believe in our company's mission as a corporate citizen to cooperate as a member of the society in the building of a healthy and vibrant society. We have especially contributed to the society by focusing on the "development of human resources." We have also supported programs for multi-cultural understanding and volunteer activities to help build a society of coexistence in which every inhabitant can lead a happy life by supporting each other. With a view to achieving coexistence with every stakeholder, we are tackling environmental and energy problems with the self-awareness of a global citizen.

Volunteer Activities Funds Support System

This system was introduced in FY 1998 to lend support to employees so that they can actively bear a part in the civil society. It provides funding for some of the activities carried out by organizations that are participated in on a continuous basis by Matsushita employees, their spouses, or retired employees in Japan. In FY 2001, 85 projects received funding; 11 of them were related to environmental conservation activities.

Environmental Conservation Organizations Supported by Matsushita

- Recovering White Beaches and Green Pines of Chikuzen Shingu Club (Fukuoka Prefecture)
- N.P.O. Konan Environment (Shiga Prefecture)
- Beijing Environmental Volunteers Network (Beijing, China)
- Society of Citizens to Protect the Virgin Beech Tree Forests of Hanamaki (Iwate Prefecture)
- Urban Development Study Group for the Vicinity of Kamoi Station (Kanagawa Prefecture)
- Commune with Koide River Club (Kanagawa Prefecture)
- Furukawa River Fan Club (Hiroshima Prefecture)
- Soft Energy Project (Kanagawa Prefecture)
- Bamboo Volunteer Society "Bamboo Rangers" (Osaka Prefecture)
- Wuyun Forest Desert Tree Planting Volunteer Association (Osaka Prefecture of Japan, Inner Mongolia of China)
- Myokenzaka District Urban Development Committee (Osaka Prefecture)

Total funding for volunteer activities in FY 2001:
19,506,000 yen (85 organizations)
Funding for environmental conservation activities:
2,595,000 yen (11 organizations)

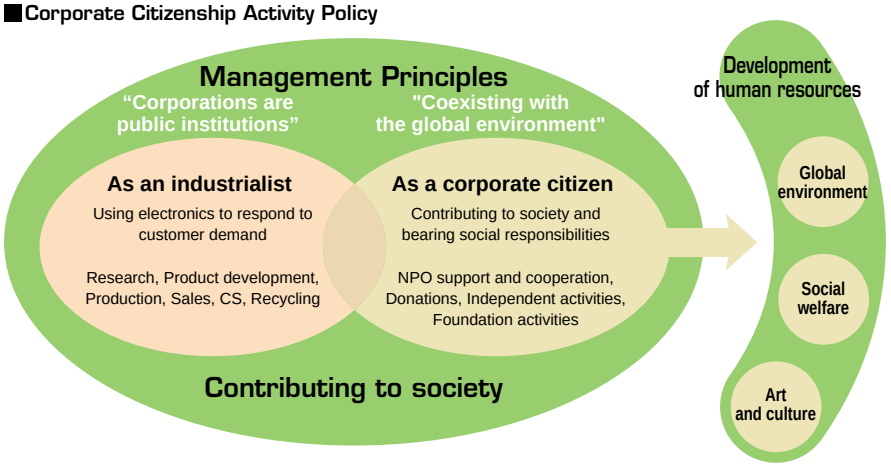
Recovering White Beaches and Green Pines of Chikuzen Shingu Club

The purpose of the Club is to recover white sand and "Tate-no-matsubara" pine grove along the Shingu beach in Fukuoka Prefecture in order to pass them on to future generations. The Club organizes tree-planting gatherings for families and tree-thinning activities for primary and middle school students in cooperation with local schools. (Activist: Yutaka Yokoyama)

Beijing Environmental Volunteers Network

This is an environmental NGO established in September 2000 for the Japanese people living in Beijing and the Chinese to carry out joint activities, including seminars, environmental concerts, and exchanges with environmental groups and operators of organic farms. (Activist: Yuko Kitamura)

Corporate Citizenship Activity Policy



Soft Energy Project

The Project provides learning experience through participation in environmental conservation events organized by citizens, governments, and businesses, in particular using solar panels and wind power generators to help combat global warming. (Activist: Isao Sakamoto)

Bamboo Volunteer Society "Bamboo Rangers"

The Society carries out activities to tend the poorly kept bamboo thickets at the Hattori Ryokuchi Park in the northern part of Osaka and to preserve the scenery. It also participates in activities carried out at the Park such as making charcoal from thinned out bamboo plants, walking on bamboo stilts for recreation, and farming. (Activist: Ichiro Ota)

Support for Major Environmental Conservation Organizations in Japan

In the environmental conservation field, Matsushita supports civil groups in Japan that carry out socially significant activities, participates in their activities as a group member, and cooperates in the implementation of programs.

Japanese Environmental Conservation Organizations Supported by Matsushita

- Nature Conservation Society of Japan
- Osaka City Promotion Association
- Ecosystem Conservation Society - Japan
- Wild Bird Society of Japan
- Institute of Urban Traffic Research
- Japan Environment Association
- Forest Culture Association
- Organization for Industrial, Spiritual and Cultural Advancement International
- Japan National Trust
- World Wildlife Fund Japan
- KEIDANREN Nature Conservation Fund
- National Land Afforestation Promotion Organization
- Japan Environmental Education Forum
- Flower Society
- Corporation to Protect Verdant Pine Trees in Japan
- (NPO) Nature Film Network
- General Energy Promotion Committee
- The Children of Earth's Club
- International Education Information Center
- Japan Bamboo Society
- Earth Day 2001 Steering Committee
- Kansai Environmental Information Station Pico
- Maishima Festival 2001 Steering Committee
- Global Environment University Seminars Steering Committee

A total amount of financial support for the above organizations: 19,890,000yen (as of March 2002)

Major Activities

●Children's Supporters Matching Fund

Japan

In cooperation with the International Youth Foundation Japan Office (IYF Japan), Matsushita launched a fund to help strengthen the NPO base in support of children. In FY 2001, we appropriated grants to seven organizations.

First Grant Projects Total Grant in FY 2001: 7,500,000 yen

(NPO) Takatori Community Center
Supported video making by children of different countries and cultures
Japan International Center for the Rights of the Child
Supported the project to strengthen the organizational base and operation capacity
WIZ-NATURE
Supported staff training to provide nature experience activities for children
(NPO) Houjousha
Supported the project to strengthen the management base of the organization
Club of Children and Students Working Together for Multicultural Society
Supported the project to upgrade operational functions and accountability of activities
(NPO) SEAN
Supported restructuring of gender-free educational programs for adolescent children and the training of educators
(NPO) Artists and Children
Supported the project to strengthen the base of the Project for Artists and Primary School Students

●Kid Witness News (KWN)

North America

This is a program launched by Matsushita Electric Corporation of America in 1989 to support education for mainly primary and middle school students throughout the USA. Today, the program provides video equipment and production expertise to approximately 200 public schools in the USA and Canada to support their extra-curricular activities in video production. Students from Columbia University also volunteer their time to give seminars in support of the activities.

Primary school students interviewing a gold medallist of the US Olympic swim team (Salt Lake City)

●Panasonic Foundation

USA

The Foundation was established in 1984 with a fund of 10 million US dollars to commemorate the 25th anniversary of the inauguration of the Matsushita Electric Corporation of America. It provides support to schools, mainly from primary to high schools, in order to improve the educational system. In FY 2001, the Foundation donated 1.9 million US dollars to support a project, targeting schools in nine cities (more than 344,000 students), to conduct investigation, review, and engage in consultation regarding unfairness in the educational system resulting from differences in race and disparity in wealth.

Teachers attending the Project's seminar

●Sponsorship of Panasonic Writing Contest

Panama

With support from Panama's Ministry of Education, Panasonic Latin America S.A. hosts an annual writing contest with the objectives being to help primary school students evaluate their academic ability and to give them incentive for learning. In the 4th Writing Contest held in FY 2001, "Towards the establishment of children's rights advocated by the United Nations Children's Fund (UNICEF)" was chosen as the theme. In total, 1,020 students from 20 public and private schools in Panama submitted articles.

FY 2001 Writing Contest Award Ceremony

●Tangshan Matsushita Environmental Conservation Fund

China

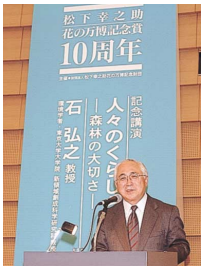
Tangshan Matsushita Industrial Equipment Co., Ltd. established an environmental conservation fund in 1997, the first Chinese company to do so, and has donated a total of 500,000 yuan in the last four years. It gives public recognition to people who have contributed to Tangshan City's environmental activities. In 2001, monetary awards totaling 14,000 yuan were given to 18 individuals who have made outstanding contributions to the protection and improvement of the living environment.

FY 2001 Tangshan Matsushita Environmental Conservation Fund Award Ceremony

●K. Matsushita Foundation of Expo '90

Japan

In order to facilitate the realization of Expo'90 philosophy of "Coexistence of Mankind and Nature," the Foundation gives Commemorative and Encouragement Prizes every year to individuals and groups residing in Japan in recognition of their distinguished academic studies and practical activities. In a February 2002 event to celebrate the 10th anniversary of the Foundation's establishment, the Foundation organized a commemorative lecture on "Daily Life and the Natural Environment–The Importance of Forests," delivered by an environmental expert, Professor Hiroyuki Ishi at the Graduate School of the University of Tokyo.



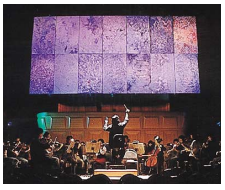
Recipients of the 10th Annual Awards

Commemorative Prizes
The sixteenth Touemon Sano Known as the "Guard of Cherry Trees," Mr. Sano contributed to the preservation of over 200 kinds of cherry trees representative of different parts of Japan, as well as the planting and dissemination of cherry trees overseas.
Hideo Tagawa, President of Kagoshima Prefectural College Mr. Tagawa elucidated the process by which nature recovers its luxuriant state by studying the lava plain formed by volcanic eruptions at various stages of its history at Sakurajima Island, and contributed to the designation of Yakushima as one of the world's natural heritage sites.
Encouragement Prizes
Yoshihiko Yamate, President of Seikoen Inc. Mr. Yamate contributed to the popularization of the chrysanthemum in Japan and abroad by introducing new varieties in form and quality.
Ken Sato, Professor of Engineering, Hokkai Gakuen University Mr. Sato established many academic theories about Japanese alpine flora and vegetation and contributed to the discovery of new species such as *Callianthemum sachallinese var. kirigishiense.*

●"Feeling Arts" as a Healing Art

Japan

"Feeling Arts" was created with the unique sensibility and techniques of a modern artist, Yoshihiro Kitamura. It is a futuristic art form combining paintings, luster, and music. The artist himself projects colorful lights on a big canvas of abstract drawing painted with sumi-ink, soil, and gold powder. Beautifully synthesized or orchestrated music, or gagaku, the ancient court music rendered with a traditional Japanese wind instrument sho, are used to arouse a myriad of images in the observer. It is said that these images can create a relaxing and healing psychological effect.



The artist collaborating with an orchestra at Osaka Izumi Hall

●OBP Arts Project

Japan

Using the Osaka Business Park (OBP) as the stage, the Project is a corporate "mecenat (patronage)" activity to introduce the modern art of young people to the business community. It supports young artists, who are mainly university students, by providing them with wide-open space or store space as venues for self-expression. These young artists not only engage in the creative works but also take the initiative in the planning, operations, and management of the Project. Therefore, the Project also serves an educational role as an experimental ground for art management.

Dance performance at the atrium

●The European Union Baroque Orchestra (EUBO)

Europe

EUBO was established in 1985 with the support of the European Commission. Every year, 25 young musicians are selected from various European countries to tour the EU and other countries, giving concerts and carrying out goodwill activities through music. Matsushita Electric Europe (Headquarters) Ltd. started giving support to EUBO activities in 1989. In FY 2001, following a tour of the UK and Belgium, EUBO gave its first concert in China.

Concert in China

●Emergency Relief for Terrorist Attacks in the USA

USA

Matsushita donated 2.1 million US dollars to the Disaster Fund for Children of NJ aiding victims of the terrorist attacks on the USA on September 11, 2001. The donations were used for the provision of emergency supplies, mental health care and counseling for victims' children, employment assistance through job training, and educational support such as tuition fees, etc. In addition, Matsushita Electric Corporation of America also donated flashlights, batteries, notebook computers, clothing, and daily supplies.

Presenting donations to the Disaster Fund for Children of NJ

Love the Earth Citizens' Campaign

Matsushita started promoting the Love the Earth Citizens' Campaign (LE activities) beginning in 1998. In the campaign, employees and their families actively participate in environmental activities at home and in their communities. We believe that changing the awareness, action, and lifestyle of individuals can contribute to the transition to a sustainable society. In FY 2001, we further expanded our activities by shifting emphasis from raising awareness to encouraging participation.

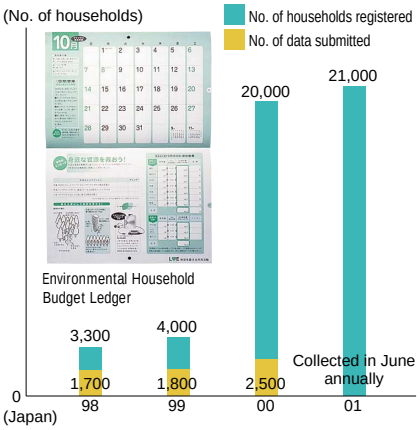
The Environmental Household Budget Ledger

In Japan, the increase in household energy consumption is a serious concern. Families should be encouraged to have higher awareness of energy saving and to put it into practice. As a company that supplies electric home appliances, we encourage employees to implement an eco-life by using the Environmental Household Budget Ledger to track the amounts of electricity and water consumed in their households.

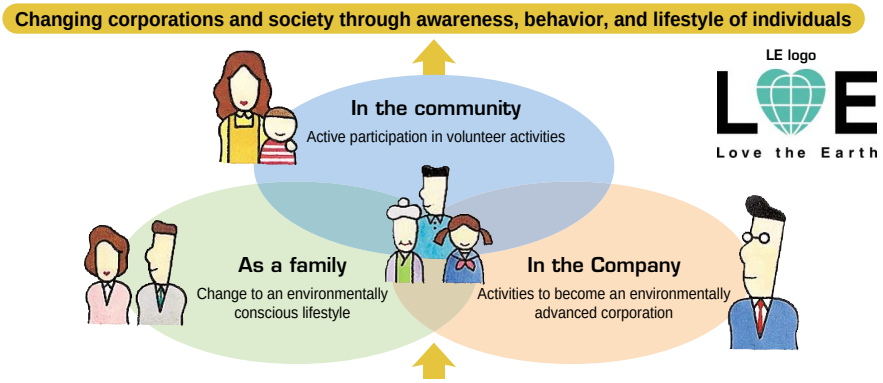
The Expanding Circle of LE Families

Families having adopted the use of the Environmental Household Budget Ledger are called "LE Families." There were 21,000 LE Families in FY 2001. Families that submitted their eco-account data were awarded the "LE Family Certification" and Matsushita's original Eco-bag. Efforts are being made to invite more families to participate in the campaign and to make steady progress.

■Number of LE Families and Data Submitted



■The goal of Love the Earth Citizens' Campaign



Awareness-raising and activity support for employees and their families

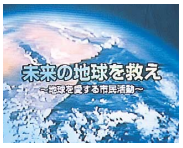
Launch of the Eco-bag Movement

As an act in support of an environmentally conscious lifestyle, we advocate the Eco-bag Movement, which promotes the use of one's own bags when shopping. To kick off the movement, we invited employees and their families to submit designs for the Eco-bag in FY 2001. Based on the designs, the Matsushita original Eco-bags were made.

Shopping with the Eco-bag

Making and Using the LE Video to Raise Environmental Awareness

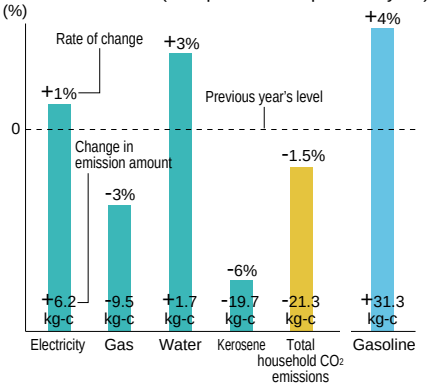
To stimulate voluntary LE activities, Matsushita employees made a video to introduce LE Families. The video is shown in informal gatherings at the workplace and for environmental education purposes.



Title screen of the LE video

■Changes in CO_2 Emissions by Energy Type

(Compared to the previous year)



(Note) The result represents an aggregate of data from part of households (1,344 households) selected as monitors.

Matsushita Green Volunteer (MGV) Club

The Matsushita Green Volunteer (MGV) Club was established in 1993 with funds contributed by approximately 70,000 of Matsushita's current and retired employees and the Workers Union. In support of the Club, the company also donated a similar amount as a matching gift. The clean-up of the Osaka Tsurumi Ryokuchi green areas, which started in May 1994, has been carried out on a continuous basis on the second Saturday of each month from April to November of every year, amounting to a total of 55 times as of April 2002. It started mainly as a park cleanup effort and has evolved in recent years into a nature experience initiative for Club members to observe nature and make craftworks with children. In other areas as well, the Club strives to make activities enjoyable for families. In FY 2001, among the total of 10,000 activity participants, over 10% came with their families. The Club will continue to provide opportunities for children to experience the richness of nature and the beauty of greenery.

Participants of the 55th Osaka Tsurumi Ryokuchi Cleanup activity held in April 2002

Community-based LE Activities

Energy Conservation Contest

North America

In connection with the Earth Day, Matsushita Electric Corporation of America sponsored a drawing contest for the children of all employees in the North America region. The theme of the contest was "What is energy conservation to me?"

The award-winning picture of a kindergarten student chosen from over 70 entries

Cleaning up of Beaches

Singapore

In November 2001, about 400 employees of Matsushita Group in Singapore and their families carried out a beach cleanup at the East Coast Park. The event helped raise the environmental awareness of the participants.

Employees and family members participated in the cleanup event

Takatsuki Citizens' Forest Activity

Japan

Since 1993, the workers and management of our Lighting Co., Display Devices Company, and Semiconductor Co. had been participated in a citizen-led afforestation activity. Having completed the tree planting in 1999, the group continued to carry out weeding and maintenance of the forest. In FY 2000, the group received the Greening Merit Award from the Osaka Government.

The on-going voluntary forest maintenance activity

TOPICS

Symposium for Love the Earth Citizens' Campaign

As a part of the Environmental Forum 2001 (see p. 9), the first open symposium in LE activity was held in October 2001 in conjunction with other events. We used "Nurturing eco-minded citizens" (environmental education), which is the foundation for the Creation of *"Wa-no-kuni"*–An Eco-society Through Partnership, as a universal theme to study the ways of conducting corporate citizenship activities.

Number of participants: Approximately 800

Symposium	Oct. 2	Approximately 300 people
Movie	Oct. 6	Approximately 400 people
Participatory activities	Oct. 6	Approximately 100 people

In summarizing the panel discussion, we stated our company's plan of action for the future. Since the launch of LE activities four years ago, the symposium was the first such opportunity to dispatch this message to the society. Due to the unexpectedly overwhelming response, we intend to expand LE Activities beyond our corporate framework and develop them into a citizen movement.

Future Goals

Develop the activity with social influence

1. To set targets and pursue them on a global scale to seek real solutions to environmental problems
2. To expand the registration and participation of personnel to carry out volunteer activities
3. Within the theme of environmental education, to expand corporate activities into partnerships with other companies, local governments, schools, and civil groups.

Keynote speech by Hisatake Kato, President of Tottori University of Environmental Studies
Mr. Kato explained three rules of prohibition in the environmental education for children, who are the leaders of the future.

A virtual panel discussion using the Internet was held in advance to clarify the expectations and demands for businesses and to seek ways to strengthen cooperation between the industry, government, and academia.

Shoichi Sengoku, senior scientist of the Japan Wildlife Research Center, was invited to the screening of award-winning films of the 5th Japan Wildlife Festival, along with young children, primary school students, and their families living in Tokyo.

Various activities, including weeding, cleanup, nature observation, craftworks, and tree nurturing, are carried out on a continuous basis at the Hitorizawa Citizens' Forest at Isogo Ward, Yokohama City.

Children who watched the environmental films also looked at the exhibition of the Environmental Forum with enthusiasm. This was the first time to invite children to the open forum.

Comment of a participant

> Please take the lead and exert influence on society in environmental efforts. I realized the importance of nature. I look forward to the next forum.

URL **LE Symposium (Japanese only) http://www.matsushita.co.jp/environment/event/forum/le/discussion/**

Relationship with Employees

A company cannot accomplish its mission if there were not "people" to utilize its business resources. Matsushita has established a personnel system based on "respect for mankind" and is working to create a new corporate culture that approves diversity in values. Since FY 2001, Matsushita has been stepping up activities to shape a vigorous corporate culture that aims at creating a "Matsushita Full of Excitement and Creativity."

Personnel Policy

Matsushita's personnel policy is based on the principles of "people" as the foundation for management and "developing people before making products." This policy has three main characteristics: "participative management," "merit system," and "people-oriented management."

On the basis of this policy, new initiatives have begun. In order to offer customers more innovative and productive solutions and to contribute to the society of the 21st century, our employees must display a higher level of independence and individuality than ever before. While continuing to share the company's aspiration for customer satisfaction, employees are expected to fully utilize their creativity, contribute to the society, and seek self-actualization. Based on the philosophy of building this new relationship between "independent individuals" and the "company," we are carrying out various personnel initiatives.

Participative Management
Each job has its own important functions. Everyone is manager of their jobs.
Merit System
Compensation shall be determined based on fair appraisal of performance and capability.
People-oriented Management
"People" are the source of added values. We realize our responsibility in appropriately developing and allocating human resources.

Personnel System

In order to give recognition to and utilize the diverse values and individuality of employees, we are working on a personnel system that will increase employees' options in career planning and on schemes that will enable employees to challenge jobs of their choice utilizing their capabilities. Furthermore, Matsushita is creating a corporate culture that values customer perspective and a flat organization based on consensus and cooperation.

New Personnel System

Name of system	Description	Results
e-challenge	A system that enables employees to apply for job opportunities offered by Matsushita's new or expanding businesses, or to demonstrate their skills to attain a job transfer to their desired workplace.	700 applications 300 job transfers
Flexible payment system (upfront payment of retirement allowance)	Payment system in which employees will be given a choice of having their retirement allowance and welfare benefits paid in advance in addition to their yearly bonuses.	52% of new employees chose this system (FY 2001)
Panasonic Spin-Up Fund	An in-house venture fund established to discover and nurture employees with entrepreneurial spirit and to support their ventures.	210 applications 6 companies established
Promoting "exciting works"	An initiative to establish a venue for direct communication between the company president and young employees in order to facilitate thorough implementation of management policies and to create an open corporate culture.	Started in FY 2000 Total of 7 meetings held
Multiple Assessment Program	A system for a team leader or above employee to have colleagues assess his/her performance. It intends to raise awareness of one's progress in performance and to increase understanding in the assessment process.	Evaluated 17,631 employees

Initiative for Building Equal Partnership

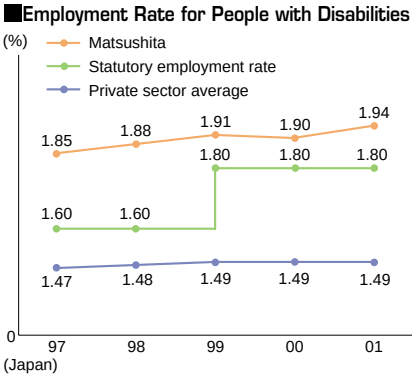
Matsushita established its Corporate Equal Partnership Division in FY 2001. In working towards a "Matsushita that is filled with diversity where all the employees work vigorously regardless of their gender," we have disseminated our Equal Partnership vision, supported related departments in reforming their business environment, and promoted women's participation in corporate management. In order to become a customer value creating company, we are committed to cultivate a corporate culture appropriate for a truly global corporation.

Company-wide Equal Partnership Forum

Employment for People with Disabilities

No matter whether they have disabilities or not, it is wonderful for people to find satisfaction in life by utilizing their various aptitudes and abilities in work. To create a workplace for people with disabilities, we support local governments in the establishment and operation of welfare factories for manufacturing activities and operate three subsidiary companies for the same purpose. For the past five years, we have maintained an employment rate of people with disabilities higher than the private sector average and also higher than the rate required by law. Matsushita is highly recognized for these efforts and has received a variety of awards related to the employment of people with disabilities.

Employment Rate for People with Disabilities



Safety and Health

Based on the corporate philosophy of "respect for mankind," all Matsushita employees are joining forces and making intensive efforts to ensure safety in the workplace and to promote employees' health, anticipating future changes in the workplace.

The Charter of Matsushita Electric
Occupational Safety and Health

Declaration of safety and health at the workplace

We will make a consistent effort to fulfill our corporate philosophy that embodies "respect for mankind" by building a safe and pleasant workplace in order to ensure the physical and mental health of all employees.

Guidelines for Occupational Safety and Health

1.Complying with legal requirements
2.Investing management resources
3.Establishing and maintaining occupational safety and health management system
4.Clarifying responsibilities and authority, and establishing an organizational structure
5.Eliminating and reducing dangerous or harmful factors
6.Setting goals/making and implementing plans
7.Auditing/management review
8.Education and training

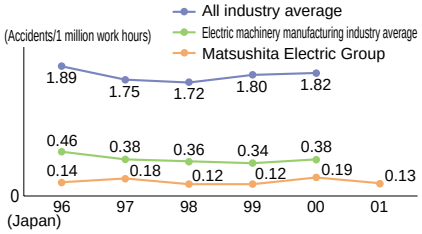
Efforts to Eliminate Labor Accidents

Stepping up our goal from "zero-accident" to "zero-risk," we are undertaking activities aimed at identifying and reducing potential dangers and health hazards lurking in the workplace. To achieve this goal, it is essential that not only managers and supervisors but all employees should have knowledge about risks and understand safety rules. In October 2001, we started a new systematic employee education program that encompasses legally required education and other courses unique to Matsushita.

Occurrence of Labor Accidents

The number of labor accidents in 2001 decreased by 20% from the year 2000 total. In particular, the number of "lost-time accidents," which caused a worker to miss workdays to get medical treatment, has declined by 32%.

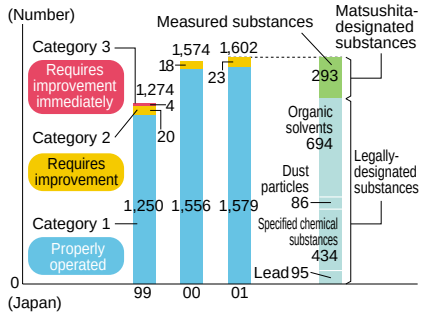
Labor Accident Rate



Environmental Measurement at Workplaces

We conduct environmental measurement of Matsushita-designated as well as legally-designated hazardous materials at workplaces where chemical substances are in use. Based on the measurement results, we take appropriate remedial steps. This practice enabled us to eradicate the "workplaces requiring remedial measures" in 2000. On the noise reduction front, our approach has traditionally been operator-based, such as donning protective equipment, but from now on we will implement solider measures–such as improvement of facilities and equipment–aimed at eliminating workplaces that require remedial action for noise.

Change in Number of Workplaces by Management Category



Mental Health (Ensuring mental well-being)

In view of a growing public interest in mental health, we have upgraded an in-house counseling system and are making aggressive efforts to ensure the mental well-being of our employees.
During FY 2001, we prepared a workplace manual with the intention that mental health problems may be detected early and appropriate steps be taken. We have also established education guidelines to ensure that all employees have accurate knowledge about mental health.

Workplace mental health manual

Global Risk Management System

Recognizing that labor safety risk management for employees is an integral part of our business operations, we have instituted a global management system. This involved establishing the Corporate Overseas Security Management Committee and assigning principal and deputy committee members to each operation site to be in charge of safety measures. This system ensures emergency communication with the committee members around the clock. The system's effectiveness was demonstrated in the September 11, 2001 terrorist attacks in the U.S.: by 3:00 p.m. on the following day Japan Time, we had confirmed the safety of all employees in the U. S.–614 employees and their familes on overseas assignment and 264 traveling for business.

Global Emergency Communications System

Safety and Health Education System

Rank / Target	Regular employees	Managers and supervisors	Top management
All workplaces	Education at the time of employment; Education at the time of task change; Outside employee education (at the time of employment/task change); Education for foreman; Health education (health consultation/health class)		Seminar for managers; Education prior to leaving for overseas assignment
Personnel engaged in dangerous or harmful work	Prior to assignment: License; Skill training; Specific education; Guidance on administrative notice. After assignment: Employee education (every 5 years/whenever necessary)		
Staff in charge of safety and health		Education for the development of ability (Safety supervisor / Health supervisor / Safety and health promoter / Operation Coordinator); Training for safety and health experts to improve business skills (whenever necessary); Training for persons in charge of safety and health; Seminar for personnel supervisor; Training for persons in charge of chemical substance management; Other training	
Engineers		Education for person in charge of special voluntary inspection; Education for person in charge of periodical voluntary inspection; Education for production engineers	Seminar for production technology supervisor

Relationship with Customers

Matsushita is engaged in business adopting "Customer-comes-first" as the central pillar of its management philosophy and is guided by the spirit of "true service" put forward by the founder K. Matsushita. To encourage customers to take good care of products and get the maximum life out of them, we are implementing measures aimed at extending the product life, such as teaching the correct usage of products, offering repair service and upgrading customer services. We are also working on the development of products that are easy to use by everyone.

TRUE SERVICE

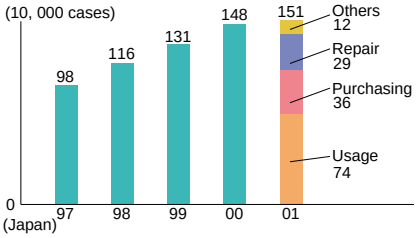
Service is an integral part of any business.
A business that does not provide service is no business at all.
Service, therefore, is the duty and obligation of any businessperson. But there's nothing more aggravating than service provided only out of a sense of duty. Customers can sense it.
Service means satisfying customers, and when we satisfy our customers, we in turn find satisfaction in a job well done. Satisfied customers and satisfied employees.
This is what constitutes true service.

Konosuke Matsushita

Customer Care Center

The Customer Care Center enables us to answer any inquiries from customers all-year-round. In FY 2001 the Center received about 1.51 million inquiries.

Number of Inquiries



Customer Care Center (Japan)
0120-878-365
(Hours:9:00a.m. – 8:00p.m.)

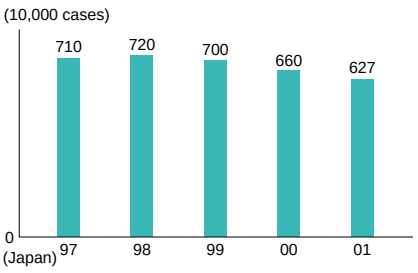
When designing a product, we depend on customer requests and suggestions received at the Center. We also offer, through our website, a wide range of information including usage of products and tips for energy conservation.

http://www.panasonic.co.jp/cs/japan/css/ (Japanese only)

Repairs and Services

In FY 2001, the number of repairs handled by our retailers and service centers totaled about 6.27 million, decreasing by 330,000 from the year 2000. The decline was attributed to improved product quality and an increase in the number of customers who opted to replace their products rather than repair them, in view of a significant drop in product price and greater energy-efficiency offered by newer models. We respond to this situation by implementing "service improvement campaigns," with the aim of reducing repair cost by cutting down the time required for repair work.

Number of Repairs



Central Technical Repair Center

The Central Technical Repair Center in Saitama Pref. represents one of our centralized comprehensive repair shops, which boasts a yearly repair capacity of about 600,000 units. Replete with the advanced equipment and systems, the Center offers high-efficiency repair work.

High-speed receiving and sorting lines

Repair lines organized according to the level of difficulty

TOPICS

Repair Service at "Pana Service Ko-bo"

Some 20,000 domestic Matsushita-affiliated retailers offer repair service. Out of these, about 3,000 retailers have been certified as "Pana Service Ko-bo" for fulfilling certain requirements. These retailers put up a "Pana Service Ko-bo" sign, set up a repair counter in the store and clearly indicate repair costs and the date of completion, thereby offering reliable repair work and after-sale follow-up. The retailers also provide a five-year service program (chargeable) called "Pana Reassurance Program." Our sales companies and service companies assist in building this system as well as in upgrading technical skills.

Pana Service Ko-bo in Retailers

Enhancing Usability (Overall User-friendliness)

To respond to a variety of changes in society such as the increase in product functions, sophistication of technology and the rising number of the elderly population, we strives to improve product usability.

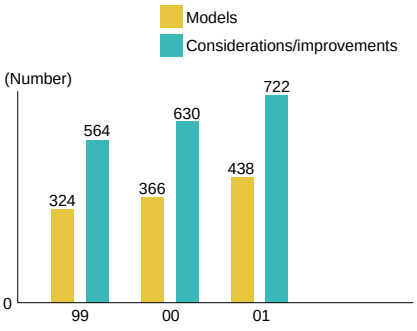
"Universal design" is a concept that aims to make daily life easier for everybody regardless of disability, age, sex and nationality. The term means "featuring designs that are easy to use for everybody." At Matsushita, we are engaged in pursuit of usability worldwide in terms of three aspects: "friendly" products, which are easier to use for the people without disabilities; "barrier-free" products, which the elderly and people with disabilities find no difficulty in using; and "accessibility," which represents products that can be used by people with disabilities.

During FY 2001, we have increased the number of universal design products to 438 models. The number of universal design considerations or improvements expanded to 722. These efforts won recognition and we were honored with the Minister of Economy, Trade and Industry Prize of the "2001 Excellent Consumer-oriented Group" Award.

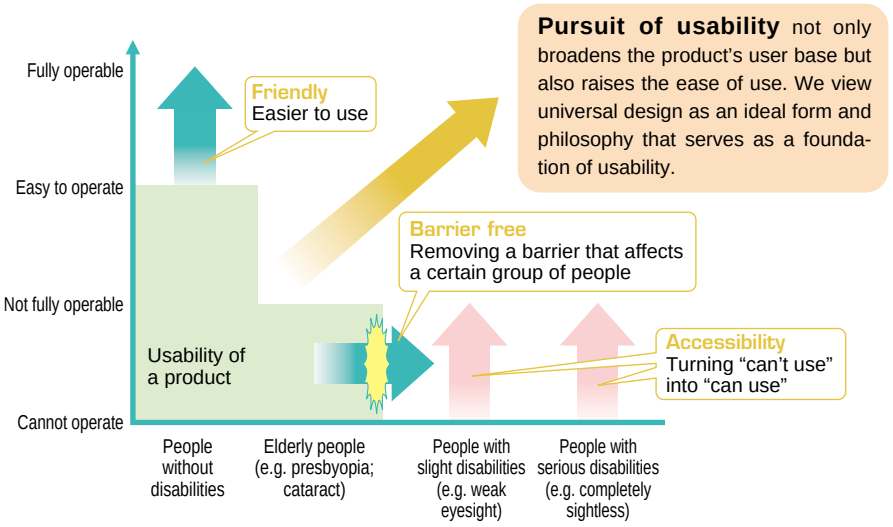
Examples of Research Themes

- Ease-of-use factors
- Timer-setting procedure
- Daily life of the elderly people
- Daily life of visually impaired people
- Braille and embossed signs
- Audibility of appliance beeps
- The posture and movement of elderly people
- Daily life of people who need care or assistance

Products Incorporating Universal Design



Thinking behind the Pursuit of Usability



Pursuit of usability not only broadens the product's user base but also raises the ease of use. We view universal design as an ideal form and philosophy that serves as a foundation of usability.

Development of goggles for experiencing cataracts

Senile cataracts is one of the physical declines caused by aging. About 60% of 50-year-olds and about 90% of the 70-year-old population are estimated to be afflicted with cataracts. In collaboration with hospitals, universities and consumer monitors, Matsushita has developed goggles for experiencing cataracts. The device helps young design engineers understand and evaluate the condition of elderly people.

Operation panel of a washing machine

Without goggles

With goggles

Ensuring Usability Globally

We hold in-house seminars on the Telecommunications Act and the Rehabilitation Act, both U.S. laws that require improvement of product usability of IT devices for the elderly and people with disabilities.

In-house seminar at Matsushita Communication Industrial Co., Ltd.

Product Examples

The seated body shower offers a new method of bathing: it allows the bather to remain comfortably seated on a chair and enjoy the same thermal effect as that of bathing in a bathtub. The device not only reduces the load on the heart exerted by the pressure of water but also cuts down the amount of hot water use to one quarter that of bathtub bathing. In addition, it can be operated by remote control, a useful feature when used for care-giving purposes. The product received the Universal Design Prize in the Good Design Awards of 1997. A cordless cleaner is a type of vacuum cleaner that does not have an electric cord. With a lightweight body and operational simplicity, which involves simply pulling down the handle to turn the power on, the cleaner is easy to use by anyone, from children to elderly people.

Seated body shower

Cordless cleaner MC-B35M

URL **Efforts toward universal design (Japanese only) http://www.lifevit.com/store/universal_d/**

Environmental Communication

Because their causes are complex and they are closely related to human lifestyles, solutions to global environmental problems cannot be borne by any single corporation. To arrive at a solution, all participants in the social system–Matsushita that makes products, suppliers that provide materials, employees who support manufacturing, customers who use our services and products, government and research organizations that set laws and create systems, and the mass media that makes information available–must work toward the same goal.

Environmental communication has an important role of linking these various stakeholders and Matsushita. We promote the disclosure of environmental information using various media such as the Environmental Sustainability Report. Matsushita's new efforts in FY 2001 include the holding of the Global Environmental Forums in Japan as well as in Germany and the first-ever Stakeholders Meeting*1. We at Matsushita will continue to promote communications aimed at creating a sustainable society.

*1 See Environmental Sustainability Report 2001

■Various Stakeholders and Matsushita

Communication Activities and Achievements

●Publication of the Environmental Sustainability Report

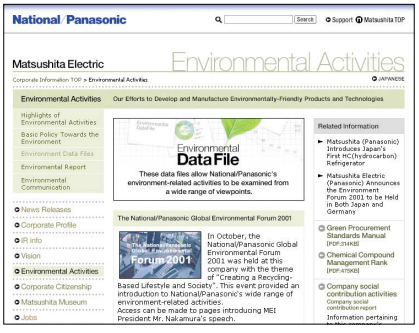
First published in FY 1997, the Environmental Sustainability Report is the core medium of our environmental communication. Because Matsushita's activities and the needs of our readers are diverse, the amount of information and number of pages in the Report continue to increase every year. Even at our affiliated companies, environmental information disclosure is being promoted through Environmental Sustainability Reports and websites.

■Publication History of the Environmental Sustainability Report

FY	Japanese (copies)	English (copies)	Pages
FY 1997	17,000	8,000	24
FY 1998	10,000	10,000	28
FY 1999	18,000	5,000	40
FY 2000	22,000	5,000	56
FY 2001	20,000	5,000	66

●Information Disclosure through the Website

Our environmental website provides information on our activities from a different perspective than that of the Environmental Sustainability Report. During FY 2001, we largely renovated our website to offer information to our various stakeholders, e.g., *Environmental Data File*, a keyword index for easy searching (see below), and contents suitable for children.



The *Topics* is available on the Top Page.

URL **http://www.matsushita.co.jp/environment/en/**

●Environmental Advertisement, TV Commercials

We use television and newspaper media to inform the public about our basic stance on environmental conservation and efforts through our products. In FY 2001, we created 10 advertisements and 4 TV commercials emphasizing our response to the Law for Recycling of Specified Home Appliances and were granted the "Japan Industrial Journal's Industrial Advertisement Grand Prix, 40th Anniversary Special Award."

Natural Fluid (HC) Refrigerator

●Participation in Exhibitions

During FY 2001, in order to introduce our efforts, we held "National/Panasonic Environmental Forum 2001" in Japan as well as in Germany (see p. 9). We also participated in many exhibitions such as "Eco-Products 2001" and "ENEX2002."

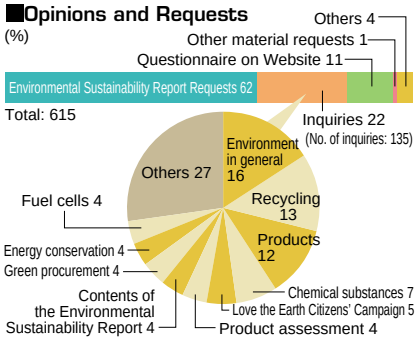
Matsushita Electric Booth
Eco-Products 2001

"Solder Recycler" using sesame seeds attracts attention

Public Opinions and Our Response

In FY 2001, we received a total of 615 comments and requests. We thank you for your interest in our activities. Here we have included some representative opinions and our responses below.

■Opinions and Requests



●On the Environmental Sustainability Report

Opinions **It seemed like the Report tried to include everything. Wouldn't it be better to focus on specific points?**

Various guidelines are created for information disclosure to enhance environmental performance throughout society. Within these guidelines, there has been a demand for including and comparing a wide range of items. We created the publication to include as many items as possible in order to closely follow the guidelines. Also, we have created a "Topics" section to highlight our on-site activities. However, as you have suggested, we will try to focus on some points and to disclose information in an easy-to-understand format, even while we continue to include extensive information.

Opinions **I would like to see more concrete, detailed data. How about publishing a digest edition?**

We have begun offering detailed information this year through the inclusion of Facts & Figures (see pp. 54-73). In this report, information on environmental load is disclosed by site and includes data from 18 sites for domestic division companies and affiliated companies. For other sites, we are planning to use the website. Publication of the digest edition is under consideration, taking into account the practicality, cost of publication, and possible use of the website.

Opinions **I think that the Stakeholders Meeting and The Natural Step's third party comments are significant efforts.**

Thank you for your kind evaluation. We will continue the Stakeholders Meeting with the next meeting planned for FY 2002. As for the sustainability analysis by The Natural Step, a general analysis for our environmental efforts was reported in the 2001 Report. This year, the target of the study was focused on our two representative products to enable a deeper analysis (see pp. 74 – 76).

●On Environmental Activities in General

Opinions **It is stated that increased production causes an increase in CO_2 emissions. Is it difficult to reduce CO_2 emissions when production is increasing?**

The reduction of CO_2 emissions with increased production volumes is a difficult challenge. In particular, there has been a large expansion in the energy-intensive device business at the domestic operation sites, and their CO_2 emissions have increased to 64% of our total emissions in Japan. In addition to the installation of the cogeneration systems, we recently have begun CO_2 reduction efforts early in the product planning stage while selecting materials and designing manufacturing processes. As a result, in a particular outstanding case, energy consumption was reduced to 1/50 of the previous level due to drastic improvements in processes. We will continue to strive to achieve both environment conservation and business development.

Opinions **You have created a recycling system, but I have doubts about concentrating your efforts only on material recycling. Have you considered intensifying customer service to lengthen product life?**

Just as you stated, recycling is only one method and we do consider it important to expand our products life. Currently, we perform about 6 million repair and maintenance annually (see p. 49). In order to expand these, it is necessary to lower repair costs. In support of this purpose, we are applying easy-to-repair structure to our products. We also try to speed up detection of malfunctions and damage by installing a self-diagnosis function. Furthermore, beginning in April 2002, we are beginning a business of the "lighting service" that sells a function of fluorescent lights to factories and offices, rather than light tubes themselves. We will continue to strive to reduce environmental load when products are discarded, such as with our new service business.

●On the Image of a Sustainable Society in 2025*2

*2 In the Environmental Sustainability Report 2001, we offered an image of a sustainable society using the scenario planning method and collected reader's comments on the image.

Opinions **It's difficult to imagine a society in the year 2025, but it is necessary for the government and businesses to have a concrete vision on what that society is expected to be and take the first step toward making it real. I can't deny that the image was meager in its substance, but I think such attempts of visualization and introduction of methods to achieve it were very meaningful.**

I believe that it will take a lot of effort, but we can realize a "Happy Society in Harmony with the Environment." I understood the importance of envisioning the future. I had a vision of all global citizens working together to prevent any further environmental destruction.

I think that people are increasingly aware of the environmental issues, but that there is little movement to join forces. We need a leader. I have high expectations for your company's direction. This vision of society is very good, but please don't wait till 2025. I want to ask you to realize it more quickly.

We concretely and qualitatively projected the sustainable future society and lifestyle and from this projection created an environmental vision and action plan for the early 21st century. We feel that it is necessary to rely on long-term actions for most environmental efforts. We are grateful that you appreciate our commitment to take concrete steps toward a future 25 years distant, at a time when the shape of society or business even 1 year in the future is uncertain. We have received many encouraging responses and much support for our "Happy Society in Harmony with the Environment" vision. We should work steadily toward realizing it.

■Image of a Happy Society in Harmony with the Environment

A society in which one can feel connected with not only human beings but also all beings on earth. Based on recognition that human activities inevitably exert adverse effect on the environment, a variety of measures are taken to maintain ecological balance. Environmental technology also advances to this end. While the impacts of past environmental problems remain, such as global warming and the depletion of the ozone layer, critical situation is evaded due to growing environmental awareness throughout the society. Environmental issues become closely associated with personal goals of self-realization and coexistence with nature, with greater and systematic social support to companies and people who voluntarily act toward these universal goals. The result is a happy society in which each individual enjoys a sense of purpose in life.

URL **Environmental Sustainability Report 2001 (Toward a Happy Society in Harmony with the Environment) http://www.matsushita.co.jp/environment/2001e/er01e_13.pdf**

TOPICS

First Meeting for Reading the Environmental Sustainability Report

In December 2001, we held the first "Meeting for Reading the Environmental Sustainability Report" jointly with Suntory Ltd. This meeting was an opportunity for two-way communication between the companies and stakeholders. Staff of corporate environmental division explained the 2001 report and the stakeholders were allowed to ask questions and express opinions directly.

Joint Sponsors: Suntory Ltd., Matsushita Electric Industrial Co., Ltd.
Date and Time: December 18, 2001 (Tuesday) 13:00-17:00
Place: Business Innovation Center Osaka
Organizers: Takao Hata, Teruo Kamura, and Tatsuro Sugiyama, Environmental Department, Suntory Ltd.
Yoshiaki Arai
Corporate Environmental Affairs Division, Matsushita Electric Industrial Co., Ltd.
No. of Participants: 50 (Business 33% Students 16% Government 7% NPO 7% Others 37%)


Inside the Meeting Room

Presentation Given by One of the Organizers


Yoshiaki Arai
Corporate Environmental Affairs Division

Four years have passed since I started working on the Environmental Sustainability Report. During this time, my desire has always been to "communicate to the public correctly and accurately our company's environmental efforts." These past several years have seen tremendous changes in businesses' views and stances towards the environment, and I wanted the public to feel this dynamism. Through my work on the environment, I feel the excitement of having a positive influence not only on Matsushita but also on society as a whole. However, I had misgivings that it would be impossible to express these things only through a printed medium and that one-way information disclosure was inadequate. Today, we will talk about what we wanted to express in the report and we would like to hear your frank opinions about our work.

In FY 2001, Matsushita for the first time since its establishment posted corporate deficits. Deficits are an indication that the company is not benefiting society and is not accepted. It represents the fact that we have been mistaken in our way of doing business. Now we must change the way. One of the keys to the change was the environment. Traditionally, "environment" has a strong nuance of cost reduction or voluntary activity for companies. Now, as it contributes to society, "environmental" efforts have become a way for corporations to increase their competitiveness over the mid to long term. In order for the public to get a clear picture of these concepts of ours, we presented a real message from the president, rather than the usual perfunctory greetings, and other features such as "Environmental Vision and Scenarios for Sustainable Society and Lifestyle in 2025."

The Environmental Vision was newly formulated in 2001. This period marked the end of the "Environmental Voluntary Plan" started in 1993, and we wanted to make a promise for the next 10 or 20 years. The Vision, setting a minimum level to be achieved, is a challenge to seek sustainability in seven aspects of our business, instead of focusing on "products" and "manufacturing" as we did in the past. The slogan of Environmental Vision "ET²!" represents our belief in two things: continued contribution through "environmental technology," as the strength of Japanese manufacturing has been and still is technology, and the importance of ecological thinking to use these technologies correctly. The action plan with this Vision as the goal is the "Green Plan 2010."

Normally, corporate plans operate in one-year cycles. Even mid-term plans are for 3 years or so; a 25-year plan is almost unthinkable. We set the plan for 2010, and that was as far as we could go. Although we were often rebuked with comments such as "in this era that requires speedy decision-making and course correction, it's foolish to make a plan for 25 years," we believe that we should run counter to this trend towards quick thinking when addressing environmental issues. Fundamentally, it is necessary for management to have a long-range vision. In bringing this long-range perspective to the management, which tends to be shortsighted, those who are involved in environmental affairs have a role to play.

Q&A

Q As a worldwide company with 30% of its production overseas, how do you handle overseas environmental management? Also, within the "Green Plan 2010" there is the idea of "cultivating environmental awareness in employees," but how will you nurture such people within the company or a community?

A Each manufacturing division, including those in foreign countries, operates separately with the Environment Conference as the top decision-making organ. However, because the Japanese viewpoint tends to be prominent and because there are many region-specific issues, regional headquarters also responsible for each of 5 global regions are managing environmental activities for that region. While each manufacturing division is the bases for activities, the management matrix allows for regional solidarity.

"Cultivating environmental awareness in employees" is currently being promoted mainly through the Love the Earth Citizens' Campaign. This campaign was started in 1998 jointly with labor unions to educate and support employees and their families in order to contribute to the environmental conservation at home and in the local community.

Q As in "Servicizing products - Making the most of eco life," the idea of providing functions of products on an as-needed basis, rather than just selling the products, is truly wonderful. Are you considering its business aspect or approaching industrial organizations for its promotion?

A This is a project aimed at exploring new business models, but is still in the research stage at our design division. Efforts on "reuse" and "reduce" have been made through review meetings for several years, but we have yet to see results. We have been doing business by selling products for 80 years and have had some success. It is very difficult to overthrow this business model. We, who are involved in environmental affairs, intend to convince the company to change. We do want a breakthrough.

Q The third party comments from The Natural Step are objective and a bit harsh. After receiving these comments, can you tell us how you will change? Also, on the last page of the report, the founder of Matsushita is talking about 250 years in the future, isn't he? Don't be discouraged if you cannot make changes in 25 years. If green consumers reach 51% of the population, the majority will change the world. If this happens, a happy society will be the norm. Another point, I am bothered that there is little information from overseas and that the report isn't international.

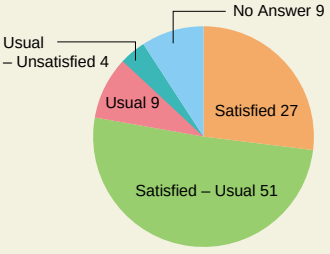
A From The Natural Step, we wanted a strict evaluation from the viewpoint of the world's leading authority in this field. We wanted to know how they viewed our philosophy and efforts and what level they felt we had reached. With these results in mind, we will accept the challenge of a drastic change of our business structure.

As for the green consumer, I don't believe we have surpassed the 50% mark within Matsushita. Certainly, if there were a 51% majority of green consumers, the company and society would change. As there are top-down, bottom-up or many other ways of accomplishing this, we would like to overcome this with wisdom and innovative ideas.


Enthusiastic questions from participants

Results of the Audience Questionnaire about the Meeting

(%)



This meeting was held to discuss the Environmental Sustainability Report 2001

Facts & Figures

ISO 14001 Certification Status

As of March 2002

Region	Sites of Division Companies and Affiliated Companies	Major Products	Date of Registration
Japan (Manufacturing)	AVC Company, Matsushita Electric Industrial Co., Ltd.		
	Multiple-site Certification Group (10sites)	TV, VCR, Audio equipment, DVD	1995.11★
	Matsunaka Industrial Co., Ltd.	Radio cassette recorder	2001.3
	Home Appliance & Housing Electronics Company, Matsushita Electric Industrial Co., Ltd.		
	Home Utility Appliances Division	Automatic washing machine, Dishwasher	1998.7 ★
	Ecology & Cleaning Products Division	Vacuum cleaner, Garbage disposer	1998.6 ★
	Cooking System Division, Kobe Site	IH cooking heater, Electric pot	1998.6 ★
	Cooking System Division, Yashiro Site	IH rice cooker	1998.4 ★
	Nara Site	Microwave oven, Gas/kerosene equipment	1997.11★
	Kitchen and Bath Products Group	Kitchen system, Bath system	1998.7 ★
	Air-Conditioner Company, Matsushita Electric Industrial Co., Ltd.		
	Kusatsu Site	Air conditioner, Compressor	1997.10★
	Kofu Site	Compressor	1997.5 ★
	Motor Company, Matsushita Electric Industrial Co., Ltd.		
	Daito Site	Industrial motor	1997.8 ★
	Takefu Site	Home appliance/air conditioner motor	1998.2 ★
	Yonago Site	IT device motor	1997.12★
	Matsuzaka Electronic Circuit Co., Ltd.	Industrial compact geared motor	1999.2 ★
	Semiconductor Company, Matsushita Electric Industrial Co., Ltd.		
	Multiple-site Certification Group (4 sites)	Semiconductor	1997.11★
	Matsushita Electronic Instruments Corporation ,Takatsuki Site	Shadow mask	1997.11★
	Matsushita Electronic Instruments Corporation ,Utsunomiya Site	Semiconductor, Magnetron	1997.6 ★
	Toyo Dempa Co., Ltd., Kyoto Site	Diode	1997.6 ★
	Toyo Dempa Co., Ltd., Kameoka Site	Lead frame	1997.9 ★
	Kumamoto Dempa Co., Ltd.	Transistor	1997.9 ★
	Lighting Company/Display Devices Company, Matsushita Electric Industrial Co., Ltd.		
	Takatsuki Site	Fluorescent lamp, CRT, PDP	1997.11★
	Utsunomiya Site	Fluorescent lamp,CRT	1996.9 ★
	West Electric Co., Ltd., Nagatano Site	Flashtube, Backlight lamp	1998.3 ★
	Liquid Crystal Display Group	LCD module	1998.2 ★
	Factory Automation Company, Matsushita Electric Industrial Co., Ltd.		
	Kofu Site	Electronic components mounting equipment	1997.12★
	Matsushita Electric Industrial Co., Ltd.		
	Electronic Circuit Capacitor Division/Matsue Matsushita Electric Co., Ltd.	Film capacitor	1998.4 ★
	Matsushita Fujisawa Factory Center	Magnesium alloy chassis components	1997.4 ★
	Matsushita Communication Industrial Co., Ltd.		
	Saedo Site	Communications network system	1997.12★
	Hanamaki Site	Cellular phone, PHS	1998.10★
	Shizuoka Site	Cellular phone	1997.12★
	Matsumoto Site	Car navigation system, Car-audio equipment	1997.6 ★
	Shirakawa Site	Microphone, CCVE camera	1995.12★
	Matsushita Electronic Components Co., Ltd.		
	Multiple-site Certification Group (13 sites)	Various electronic components	1996.12★
	High Frequency Products Business Unit	Digital tuner	1997.11★
	High Frequency Products Business Unit, Motomiya Site	Hybrid IC	1997.11★
	Hokkaido Matsushita Electric Co., Ltd.	Multi-layer chip capacitor	1997.8 ★
	Tsuyama Matsushita Electric Co., Ltd	Touch switch	1996.12★
	Matsushita Nitto Electric Co., Ltd.	Dielectric filter	1998.1 ★
	Matsushita Industrial Equipment Co., Ltd.		
	Multiple-site Certification Group (4 sites)	FA equipment, Capacitor, Power distribution equipment	1998.3 ★
	Matsushita Battery Industrial Co., Ltd.		
	Moriguchi Site A Block	Battery, Battery components/equipment	1998.4 ★
	Moriguchi Site B Block	Lithium battery	1998.7 ★
	Chigasaki Site	Nickel hydride battery, Ni-Cd battery	1998.9 ★
	Hamanako Site	Car storage battery	1997.9 ★
	Wakayama Site	Nickel hydride battery, Ni-Cd battery	1998.3 ★
	Matsushita Refrigeration Company		
	Refrigerator Division, Kusatsu Site	Refrigerator	1997.2 ★
	Fujisawa Site	Refrigerator, Refrigerator compressor	1997.4 ★
	Food Solution Business	Vending machine, Food industry-related equipment	1997.10★
	Cooling Device Division	Refrigerator heat exchanger	1997.10★
	Mana Precision Casting Co., Ltd.	Cast metal components	1998.12★
	Kyushu Matsushita Electric Co., Ltd.		
	Joshima Site	Well pumping equipment	2002.2
	Saga Site	Printer	1997.7 ★
	Devices and Components Division, Taimei Site	Deflection yoke	1997.10★
	Devices and Components Division, Oita Site	Electric motor	1998.3 ★
	Telecom Division, Nagasaki Site	Facsimile	1997.10★
	Telecom Division, Chikugo Site	Cordless phone	1997.11★
	Kikusui Site	CD-R/RW, COMBO drive	1998.3 ★

Region	Sites of Division Companies and Affiliated Companies	Major Products	Date of Registration
Japan (Manufacturing)	Factory Automation Division	Chip mounter	1997.8 ★
	Miyazaki Matsushita Electric Co., Ltd.	Ceramic capacitor, Fixed resistor	1997.12★
	Kagoshima Matsushita Electric Co., Ltd.	LCD module	1997.3 ★
	Matsushita Seiko Co., Ltd.		
	Osaka Site	Air purifier, Humidifier, Dehumidifier	1998.2 ★
	Kasugai East Site	Ventilation equipment, Air-handling unit	1997.11★
	Kasugai West Site	Ventilation fan, Kitchen-hood	1996.12★
	Fujisawa Site	Bath dryer, Heat exchanger unit	1998.8 ★
	Matsushita Graphic Communication Systems, Co., Ltd.		
	Shonan Site	Press reporting equipment	1998.12★
	Nagano Site	Toner cartridge	1998.4 ★
	Niigata Site	Facsimile, PPC	1997.5 ★
	Utsunomiya Site	Laser scanning unit	1998.3 ★
	Matsushita Kotobuki Electronics Industries, Ltd.		
	Multiple-site Certification Group (8 sites)	Computer peripheral	1997.2 ★
	Victor Company of Japan Ltd.		
	Headquarters / Yokohama Site	Multi-layer circuit board	1998.11★
	Hachioji Site	Monitoring equipment	1997.1 ★
	Rinkan Site	CD	1997.4 ★
	Yokosuka Site	Camcorder	1997.9 ★
	Mito Site	DVC tape	1998.3 ★
	Yamato Site	Card printer, DVD	1998.8 ★
	Maebashi Site	Office Equipment, Car stereo	1998.8 ★
	Tsurugamine Site	VTR equipment components	1998.12★
	Koriyama Site	Crystal oscillator	1998.12★
	Fujieda Site	PC motor	1999.1 ★
	Oyama Site	Deflection yoke	1999.10
	Victor Isesaki Electronic Co., Ltd.	VCR circuit board	1998.12★
	Kanariya Electronic Industrial, Co., Ltd.	VCR component	2001.4
	Matsushita Environmenta land Air-Conditioning Engineering Co., Ltd.	Air conditioning system, Clean system	2001.3
	Matsushita Eco Technology Center Co., Ltd.	Recycling for home electric appliance	2002.3
	National Bicycle Industrial Co., Ltd.	Bicycle	1999.5
	Shinto Co., Ltd.	Various pump	2001.1
Japan (Non-manufacturing)	Matsushita Electric Industrial Co., Ltd., Headquarters		1998.9 ★
	Matsushita Electric Industrial Co., Ltd., Tokyo/Onarimon site		1998.8 ★
	Matsushita Electric Industrial Co., Ltd., Kyobashi/OBP Twin21N Tower		1999.5
	Matsushita Electric Industrial Co., Ltd., Overseas Group		1999.9
	Matsushita Electric Industrial Co., Ltd., Engineering Group Multiple-site Certification Group (4 sites)		1998.8 ★
	Matsushita Electric Industrial Co., Ltd., Corporate Production Engineering Division		1998.3 ★
	Matsushita Electric Industrial Co., Ltd., Corporate Industrial Marketing & Sales Division		2000.12
	Matsushita Electric Industrial Co., Ltd., Human Resources Development Company Hirakata Site		2000.11
	Shinagawa Multimedia Center		1999.12
	Matsushita Electric Industrial Co., Ltd., Home Appliance & Housing Electronics Company Mikuni Site		2001.1
	Matsushita Communication Industrial Co., Ltd., Tsunashima Site		1997.12★
	Matsushita Communication Industrial Co., Ltd., Research Laboratory Multiple-site Certification Group (3 sites)		2002.3
	Matsushita Refrigeration Company, Osaka site		1997.4 ★
	Kyusyu Matsushita Electric Industrial Co., Ltd.		1997.12★
	Matsushita Graphic Communication Systems Co., Ltd., Meguro site		2001.12
	Victor Company of Japan Ltd., Kurihama Engineering Center		1999.2 ★
	Matsushita Marketing Training Institute		1999.12
	Matsushita Industrial Sanitary Science Center		2000.3
	Matsushita Logistics Co., Ltd.		2000.7
Japan (Third-Sector Companies)	Kibi Matsushita Co., Ltd.	VCR	1998.9 ★
	Katano Matsushita Co., Ltd.	Micro cassette tape	1999.1 ★
Asia Oceania (Manufacturing)	Matsushita Refrigeration Industries (S) Pte. Ltd.	Refrigerator compressor	1996.11★
	Matsushita Electronics (S) Pte. Ltd.	Mini component stereo	1997.2 ★
	Matsushita Electric Motor (S) Pte. Ltd.	Micro electric motor	1998.12★
	Matsushita Electronic Components (S) Pte. Ltd.	Various electronic components	1998.4 ★
	Matsushita Semiconductor Singapore Pte. Ltd.	Semiconductor	1997.12★
	Matsushita Kotobuki Electronics Industries Singapore Pte. Ltd.	HDD	1998.9 ★
	JVC Electronics Singapore Pte. Ltd.	Audio equipment	1998.12★
	Matsushita Electric Co., (M) Bhd. SA1	TV, battery	1998.11★
	Matsushita Electric Co., (M) Bhd. SA2	Vacuum cleaner, Electric fan	1996.12★
	Matsushita Electric Co., (M) Bhd. BNG	Washing machine, Refrigerator	1997.8 ★
	Matsushita Electric Co., (M) Bhd. PK	Electric iron base	1998.12★
	Matsushita Industrial Corporation Sdn. Bhd.	Window-type air conditioner	1997.10★
	Matsushita Air-Conditioning Corporation Sdn. Bhd.	Separate-type air conditioner	1997.6 ★
	Matsushita Compressor and Motor Sdn. Bhd. 1	Compressor	1997.12★
	Matsushita Compressor and Motor Sdn. Bhd. 2	Motor	1998.2 ★
	Matsushita Compressor and Motor Sdn. Bhd. 3	Compressor	1997.12★

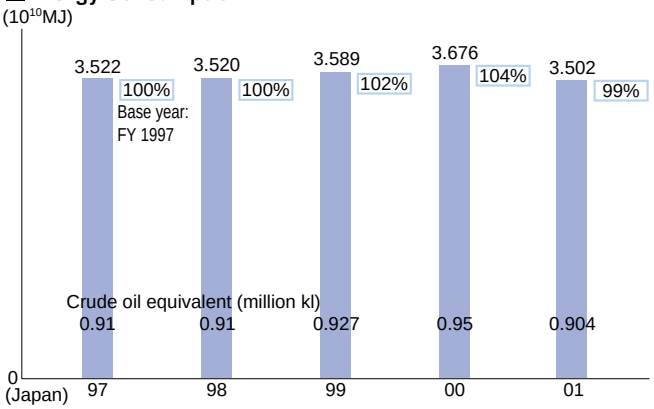
Region	Sites of Division Companies and Affiliated Companies	Major Products	Date of Registration
Asia Oceania (Manufacturing)	Matsushita Electronic Components (M) Sdn. Bhd.	Various electronic components	1998.10★
	Matsushita Electronic Devices (M) Sdn. Bhd.	Various electronic components	1998.10★
	Kyushu Matsushita Electric (Malaysia) Sdn. Bhd.	Deflection yoke	1997.10★
	Matsushita Television and Network Systems Co., (Malaysia) Sdn. Bhd.	TV	1997.1 ★
	Matsushita Electronic Motor (Malaysia) Sdn. Bhd.	AV/OA motor	1998.4 ★
	Matsushita Precision Capacitor (M) Sdn. Bhd.	Film capacitor	1998.12★
	Matsushita Foundry Industries Sdn. Bhd.	Precision casting components	1998.6 ★
	Matsushita Refrigeration Industries (M) Sdn. Bhd.	Refrigerator compressor	1998.5 ★
	Matsushita Display Device Corporation (M) Sdn. Bhd.	CRT	2000.6
	Toyodempa Malaysia Sdn. Bhd.	Semiconductor, Micro components	1998.12★
	Matsushita Audio Video (M) Sdn. Bhd.	Radio cassette recorder	1997.2 ★
	Philips and JVC Video Malaysia Sdn. Bhd.	VCR	1999.5
	JVC Electronics Malaysia Sdn. Bhd.	Audio equipment	1999.5
	NTC Group	TV, Electronic components, Electric fan	1998.7 ★
	Matsushita Battery (THAILAND) Co., Ltd.	Battery, Car storage battery	1998.7 ★
	Matsushita Home Appliance (THAILAND) Co., Ltd.	Washing machine, Rice cooker	1998.7 ★
	Matsushita Refrigeration Company (THAILAND) Ltd.	Heat exchanger	1998.7 ★
	JVC Manufacturing Co., Ltd.	Fly-back transformer	1999.4
	JVC Components Co., Ltd.	AV motor	2000.1
	Matsushita Electronic Philippines Corporation	TV, Refrigerator, Air conditioner	1998.5 ★
	Matsushita Communication Industrial Corporation of the Philippines	FDD, ECM(Microphone)	1997.12★
	P.T. National Gobel	TV, Refrigerator, Air conditioner	1998.1 ★
	P.T. Matsushita Gobel Battery Industry	Battery, Battery application equipment	1997.2 ★
	P.T. Matsushita Kotobuki Electronics Industries Indonesia	VTR	1998.6 ★
	P.T. Batam Matsushita Battery	Ni-Cd battery, Solar battery	1998.1 ★
	P.T. Panasonic Gobel Electronic Components	Various electronic components	1999.3 ★
	P.T. Matsushita Semiconductor Indonesia	Semiconductor	2000.7
	P.T. Matsushita Lighting Indonesia	Fluorescent lamp	1999.12
	P.T. Matsushita Kotobuki Electronics Peripherals Indonesia	HDD magnetic head	1999.11
	P.T. JVC Electronics Indonesia	Car stereo, Audio equipment	1999.5
	Matsushita Electric Vietnam Co., Ltd.	TV, Audio equipment	2001.10
	JVC Vietnam Ltd.	TV	2001.4
	Matsushita Electric Co., (Australia) Pty. Ltd.	TV	1998.1 ★
	Indo National Ltd.	Battery	1998.2 ★
	Indo Matsushita Carbon Co., Ltd.	Carbon rod for battery	1998.4 ★
	Matsushita Lakhanpal Battery India Ltd.	Battery	1997.12★
	Indo Matsushita Appliances Co., Ltd.	Rice cooker, Blender	1998.12★
	Matsushita Washing Machine India Pvt. Ltd.	Washing machine	2001.1
	Matsushita Television & Audio India Limited	TV, Audio equipment	2001.2
	Matsushita Electric (Taiwan) Co., Ltd.	TV, VTR	1997.5 ★
	Panasonic Computer (Taiwan) Co., Ltd.	Personal computer	1997.4 ★
	Taimatsu Industrial Co., Ltd.	Carbon rod for battery	1998.7 ★
	Kuang Yuan Co., Ltd.	Deflection yoke, Fly-back transformer	1998.4 ★
China (Manufacturing)	Beijing Matsushita Color CRT Co., Ltd.	CRT	1996.12★
	Beijing Great Wall Matsushita Seiko Airconditioning Equipment Co., Ltd.	Air-handling unit, Fan coil	1998.11★
	Beijing Matsushita Electronic Components Co., Ltd.	Tuner	1998.5 ★
	Beijing Matsushita Precision Capacitor Co., Ltd.	Film capacitor	1998.12★
	Beijing Matsushita Communication Equipment Co., Ltd.	Cellular phone	1998.11★
	JVC Beijing Electronics Industries Co., Ltd.	VCR	1999.9
	Tianjin Matsushita Electronic Components Co., Ltd.	Fixed resistor, Capacitor	1999.1 ★
	Tangshan Matsushita Industrial Equipment Co., Ltd.	Welding equipment	1998.11★
	Shenyang Matsushita Storage Battery Co., Ltd.	Rechargeable sealed lead-acid battery	1998.12★
	China Hualu Matsushita AVC Co., Ltd.	VCR	1998.6 ★
	Dalian Matsushita Communication Industrial Co., Ltd.	Car audio equipment	1998.12★
	Anyang Matsushita Carbon Co., Ltd.	Carbon rod for battery	1999.2 ★
	Shangdong Matsushita Television and Visual Co., Ltd.	TV	1998.11★
	Qingdao Matsushita Electronic Components Co., Ltd.	Touch switch	1997.12★
	Qingdao Matsushita Electronic Components (Free Trade Zone) Co., Ltd.	Touch switch	2000.8
	Wuxi Matsushita Refrigeration Compressor Co., Ltd.	Refrigerator compressor	1998.10★
	Wuxi Matsushita Refrigeration Co., Ltd.	Refrigerator	1998.10★
	Hangzhou Matsushita Gas Appliances Co., Ltd.	Gas cooker	1998.12★
	Hangzhou Matsushita home Appliance Co., Ltd.	Washing machine	1997.12★
	Hangzhou Matsushita Motor Co., Ltd.	Compact home appliance motor	1998.12★
	Hanzhou Matsushita Kitchen Appliances Co., Ltd.	Rice cooker	1999.12
	Shanghai Matsushita Battery Co., Ltd.	Battery	1998.4 ★
	Shanghai Matsushita Semiconductor Co., Ltd.	Semiconductor	1998.12★
	Shanghai Matsushita Electronic Instrument Co., Ltd.	Magnetron	1998.6 ★
	Shanghai Matsushita Microwave Oven Co., Ltd.	Microwave oven	1998.6 ★
	JVC Shanghai Electronics Industries Co., Ltd.	DVD	1998.6 ★
	Suzhou Matsushita Communication Industrial Co., Ltd.	CCVE camera	1998.10★

Region	Sites of Division Companies and Affiliated Companies	Major Products	Date of Registration
China (Manufacturing)	Matsushita Audio (Xiamen) Co., Ltd.	Mini component stereo, Personal headphone stereo	1997.12★
	China Air-Conditioner Group	Air conditioner, Compressor	1998.8 ★
	Matsushita-Wanbao (Guangzhou) Electric Iron Co., Ltd.	Electric iron	1998.12★
	JVC Guangzhou Electronics Co., Ltd.	Electronic components	1999.11
	Shunde Matsushita Seiko Co., Ltd.	Ventilation fan, Ceiling fan	1998.9 ★
	Xinhui Matsushita Industrial Equipment Co., Ltd.	Capacitor for home appliance	1998.12★
	Zhuhai Matsushita Electric Motor Co., Ltd.	Motor for home appliance	1998.10★
	Zhuhai Matsushita Battery Co., Ltd.	Lithium battery, Nickel hydride battery	1998.9 ★
	Matsushita Electronic Components (H.K.) Co., Ltd.	Various electronic components	1999.4
North America (Manufacturing)	Matsushita Television and Network Systems de Baja California, S.A. de C.V.	TV	1998.5 ★
	Matsushita Display Devices Company of America	CRT	1997.12★
	Matsushita Electric of Puerto Rico, Inc.	Speaker box	1999.3 ★
	Matsushita Home Appliance Company of America	Vacuum cleaner	1999.2 ★
	Matsushita Communication Industrial Corporation of U.S.A.	Business telephone system, Car audio	1998.11★
	Matsushita Electronic Components Corporation of America	Electrolytic capacitor	1997.8 ★
	Matsushita Electronic Components de Baja California, S.A. de C.V.	Electronic tuner	1998.4 ★
	Matsushita Battery Industrial Corporation of America (LD)	Lithium battery	1999.1 ★
	Matsushita Battery Industrial Corporation of America (MD)	Battery components	1999.1 ★
	Matsushita-Ultra Tech. Battery Corporation	Battery	1999.1 ★
	Matsushita Battery Industrial de Baja California, S.A. de C.V.	Ni-Cd battery, Nickel hydride battery	1998.4 ★
	Matsushita Refrigeration Company of America	Refrigerator compressor	1998.6 ★
	Kyushu Matsushita Electric de Baja California, S.A. de C.V.	Deflection yoke	1998.2 ★
	Matsushita Kotobuki Electronics Industries of America Inc.	TV-video combo unit	1999.2 ★
	Panasonic Disc Services Corporation	DVD disc	1999.4
	Matsushita Electric Motor Company of America	Electric motor	1999.3 ★
	Matsushita Electronic Components de Tamaulipas, S.A. de C.V.	Car speaker	2000.1
	Matsushita Industrial Equipment Corporation of America	Capacitor for home appliance	2000.5
	Matsushita Battery Industrial de Mexico, S.A. de C.V.	Rechargeable sealed lead-acid battery	2001.12
	Matsushita Communication Industrial de Mexico, S.A. de C.V.	Car audio equipment	1997.12★
	Matsushita Avionics Systems Corporation	Avionics	2001.1
	JVC Magnetics America Co.	Videotape	2000.3
	JVC Disc America (Atlanta)	Fulfillment	2000.6
	JVC Disc America (Tuscaloosa)	CD	2000.8
	JVC Disc America (Sacramento)	CD	2000.11
	Panasonic de Mexico, S.A. de C.V.	TV, Stereo set	1999.2 ★
	JVC Industrial De Mexico S.A.De C.V.	TV	1997.4 ★
	Panasonic Peruana S.A.	Battery	1998.11★
	Panasonic Centroamericana S.A.	Battery	1999.3 ★
	Panasonic de Brasil Ltda.	Battery	1999.3 ★
	Panasonic da Amazonia S.A.	TV, Microwave oven	1998.10★
	Panasonic Componentes Electronicos do Brasil Ltda.	Various electronic components	1999.3 ★
Europe (Manufacturing)	Matsushita Electric (U.K.) Ltd.	TV, Microwave oven	1997.7 ★
	Kyushu Matsushita Electric (U.K.) Ltd.	PBX, Telephone-related equipment	1996.9 ★
	Matsushita Communication Industrial (U.K.) Ltd.	Cellular phone	1996.7 ★
	Matsushita Electronic Components (U.K.) Ltd.	Speaker, Transformer, Coil	1999.3 ★
	Matsushita Electronic Magnetron Corporation (U.K.) Ltd.	Magnetron	1997.5 ★
	JVC Manufacturing U.K. Limited	TV, Audio equipment	1998.4 ★
	Matsushita Audio Video (Deutschland) GmbH	VTR, CD player	1997.12★
	Matsushita Electronic Components (Europe) GmbH	Tuner, Power supply unit	1999.4
	Matsushita Communication Deutschland GmbH	Car audio equipment	1997.2 ★
	Matsushita Display Devices (Germany) GmbH	CRT	1999.4
	JVC Video Manufacturing Europe GmbH	VCR	1999.12
	Matsushita Battery Belgium N.V.	Battery	1998.11★
	Matsushita Battery Poland S.A	Battery	1998.11★
	Matsushita Electric Espana S.A.	Vacuum cleaner, Audio equipment	1998.5 ★
	Matsushita Electronic Components (Slovakia)s.r.o.	Tuner, Power transformer	2000.7
	Matsushita Television Central Europe s.r.o.	TV	1998.11★
Overseas (Non-Manufacturing)	Matsushita Electric Asia Pte. Ltd.		1999.5
	Matsushita Technology (S) Pte. Ltd.		1997.12★
	Panasonic Singapore Laboratories Pte. Ltd.		1999.3 ★
	Matsushita Compressor & Motor R&D Centre Sdn. Bhd.		1999.12
	Matsushita Air-Conditioning R&D Centre Sdn. Bhd.		1998.10★
	A.P. National Sales Co., Ltd.		1999.9
	Siew-National Co., Ltd.		1999.9
	Matsushita Seiko Hong Kong International Manufacturing Co., Ltd.		1999.2 ★
	Matsushita Electric Corporation of America		2000.3
	Matsushita Technology Corporation of America		1999.4

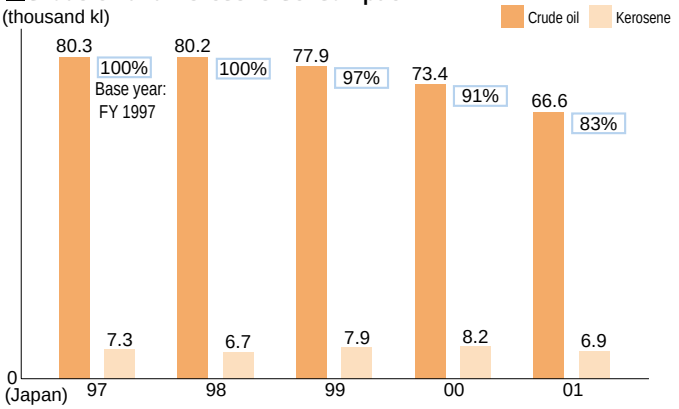
Note: Sites that have been updated by 3rd year audits are marked with ★.

Prevention of Global Warming

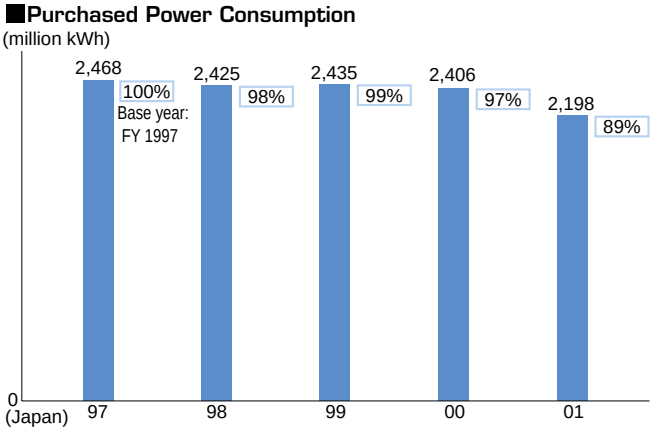
Energy Consumption



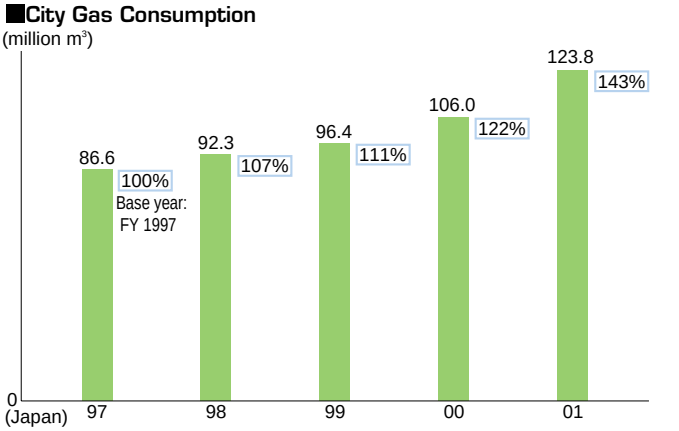
Crude oil and Kerosene Consumption



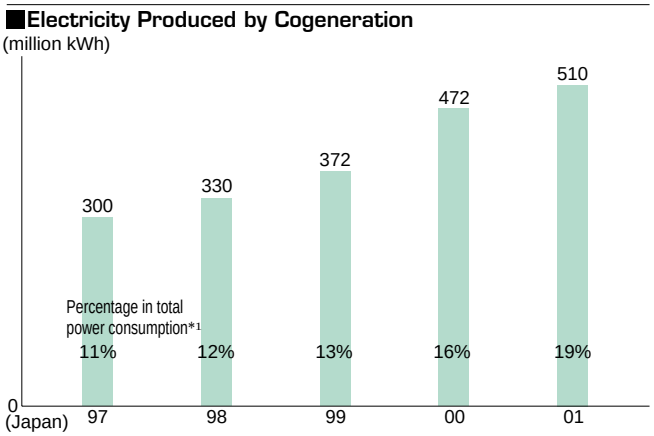
Purchased Power Consumption



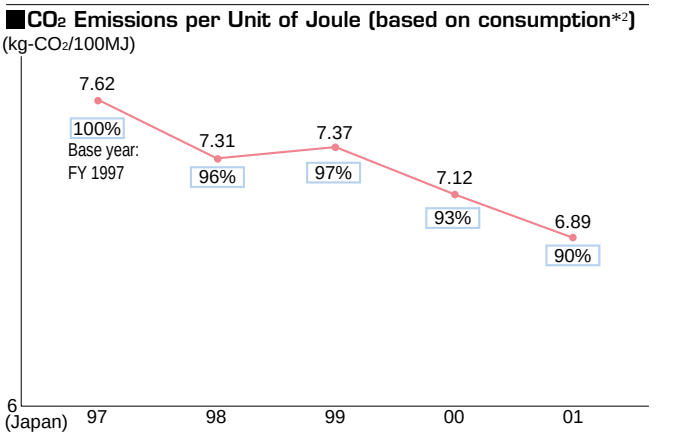
City Gas Consumption



Electricity Produced by Cogeneration



CO_2 Emissions per Unit of Joule (based on consumption*2)



Energy Consumption in the Global Regions

	Purchased Electricity (million kWh)	Energy Consumption (crude oil equivalent) (million kl)	CO_2 Emissions (million ton-CO_2)
Japan	2,198	0.904	1.404
Americas	609	0.218	0.535
Europe	134	0.047	0.097
China	394	0.137	0.483
Asia and Oceania	1,068	0.324	0.765

Note:
In Japanese facilities, we work to curb the consumption of energy such as crude oil by implementing cogeneration systems powered by city gas, and by utilizing exhaust heat. As a result, energy consumption in terms of CO_2 emissions per unit of joule has decreased.

*1 Percentage of Cogeneration in Total Electricity = Cogenerated Electricity / (Purchased Electricity + Cogenerated Electricity)

*2 CO_2 Emissions per Unit of Joule (based on consumption)
An index showing the amount of CO_2 emissions per 100 MJ of heat based on energy consumption by calculating 1kWh of electricity as 3.60MJ (860kcal). As for Energy Consumption, 1kWh of electricity is calculated as 10.26MJ (2,450kcal) input base.

Chemical Substances

Release and Transfer of Chemical Substances (Japan/unit: tons)

Substance group*1	Total	Release and transfer				Eliminated*3	Recycled*4	Consumed*5
		Released into water	Released into air	Transferred as waste*2	Subtotal			
Toluene	844.806	0.895	155.059	16.244	172.198	379.377	289.677	3.554
Xylene	165.878	4.108	79.406	16.798	100.312	39.805	23.069	2.692
Manganese and its compound	7,764.302	0.337	0.034	78.486	78.857	0.004	139.540	7,545.901
PFCs	61.818	0.000	46.311	0.090	46.401	1.701	0.005	13.711
Hydrogen fluoride and its water-soluble salt	107.859	9.446	0.412	20.460	30.318	50.218	25.114	2.209
Oxalic acid	74.053	2.564	0.000	27.274	29.838	0.000	44.215	0.000
Silicon carbide	32.969	0.000	0.000	27.061	27.061	0.000	5.908	0.000
N,N-dimethylformamide	26.630	0.438	0.310	23.197	23.945	1.316	1.107	0.262
Zirconium and its compound	26.531	0.000	0.003	20.074	20.077	0.000	2.838	3.616
Lead and its compound	43,226.498	0.015	0.180	13.834	14.029	0.060	1,304.699	41,907.710
Copper water-soluble salt (except complex salt)	510.644	0.008	0.000	13.513	13.521	94.775	394.866	7.482
Bis(2-ethylhexyl) phthalate	58.108	0.000	11.980	0.344	12.324	0.011	13.480	32.293
Halogenous flame-retardants	389.203	0.000	0.000	10.597	10.597	0.000	7.389	371.217
Ethylbenzene	13.390	0.000	7.680	2.320	10.000	3.018	0.195	0.177
Zinc water-soluble compound	985.575	0.089	0.018	9.318	9.425	0.075	52.606	923.469
HFCs	647.271	0.000	6.889	1.028	7.917	5.285	0.006	634.063
Aluminum compounds (soluble salts)	2,182.339	1.586	0.000	5.801	7.387	3.600	2,171.127	0.225
HCFCs	506.363	0.000	4.784	1.889	6.673	2.847	0.121	496.722
Barium and its water-soluble compound	97.948	0.137	0.001	6.342	6.480	0.002	1.507	89.959
Polymer of 4,4'-isopropylidenediphenol and 1-chloro-2,3-epoxypropane	133.499	0.000	1.216	4.361	5.577	0.000	0.754	127.168
Tetrahydromethylphthalic anhydride	79.751	0.000	0.010	5.367	5.377	0.000	0.372	74.002
2-aminoethanol	375.517	0.388	3.450	1.107	4.945	120.267	250.254	0.051
Antimony and its compound	249.899	0.000	0.041	4.120	4.161	0.016	24.378	221.344
Styrene	62.493	0.000	3.916	0.076	3.992	0.000	0.081	58.420
Boron and its compound	13.637	1.223	0.393	2.167	3.783	0.752	3.408	5.694
Nitrogen oxides	8.545	0.000	3.734	0.036	3.770	2.452	0.000	2.323
2-amino-5-nitrobenzonitrile	3.742	0.000	3.742	0.000	3.742	0.000	0.000	0.000
Formaldehyde	12.172	0.264	0.737	2.661	3.662	8.411	0.003	0.096
Ethyl cellosolve	3.688	0.124	1.073	2.372	3.569	0.089	0.030	0.000
Ethylene glycol	1,107.344	0.382	0.131	2.867	3.380	0.000	167.806	936.158
Methylenebis(4,1-phenylene) diisocyanate	1,566.936	0.000	0.054	3.182	3.236	0.000	0.000	1,563.700
PVC and its compound	145.499	0.000	0.000	3.025	3.025	4.900	8.311	129.263
Hydrogen chloride (gas)	9.768	0.000	2.360	0.143	2.503	7.039	0.000	0.226
Tetrahydrofuran	3.663	0.000	2.383	0.086	2.469	0.000	0.151	1.043
Sulfur hexafluoride	3.242	0.000	2.422	0.000	2.422	0.020	0.000	0.800
Nickel compound	698.991	0.004	0.060	2.083	2.147	0.012	438.901	257.931
Butyl methacrylate	1.723	0.000	1.688	0.000	1.688	0.000	0.010	0.025
Tungsten compound	6.419	0.000	1.674	0.000	1.674	0.009	0.050	4.686
1,3,5-trimethylbenzene	2.865	0.000	1.339	0.078	1.417	0.814	0.000	0.634
Nickel	1,107.744	0.008	0.032	1.338	1.378	0.000	232.846	873.520
Cyclohexylamine	1.196	0.036	0.112	1.048	1.196	0.000	0.000	0.000
Others (82 substance groups)	3,295.548	0.143	1.815	8.164	10.122	26.528	512.311	2,746.587
Total	66,616.063	22.194	345.452	338.950	706.596	753.404	6,117.132	59,038.931

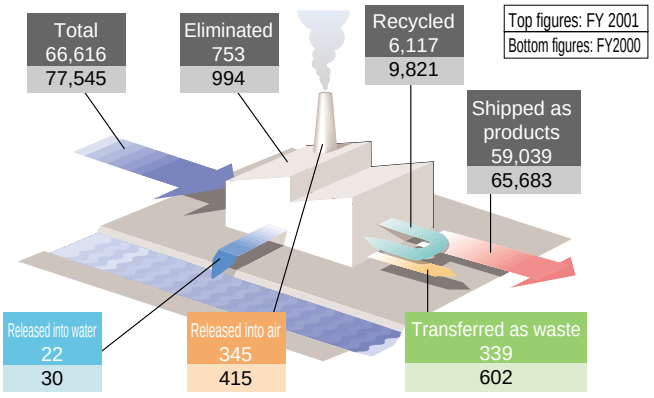
Note:The table shows substance groups that are released and transferred more than 1 ton.
Totals may not match the sum of individual items due to rounding.

*1 "Substance Groups" includes those listed in the Matsushita Chemical Substances Management Rank Guidelines (Version2) covering all substances listed in the Japanese PRTR Law.
*2 "Transferred as waste" includes the mass of substances transferred as waste, as well as wastewater discharge into the sewage system.
*3 "Eliminated" refers to the mass of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments.
*4 "Recycled" includes paid recycling, as well as free and inverse onerous contract.
*5 "Consumed" refers to the mass of substances, which are contained in or accompanying products shipped out of factories.

Use and Release/Transfer of Chemical Substances in the Global Regions

	Total use (tons)	Released and transferred (tons)
Japan	66,616	707
Americas	17,273	949
Europe	16,359	206
China	27,868	1,068
Asia and Oceania	59,397	3,057

Material Balance of Chemical Substances (Japan/unit: tons)



Waste

Generated Waste and Final Disposal Waste (Japan)

(Unit: tons)

Item	Generation		Recycling		Final disposal	
	00	01	00	01	00	01
Metal	70,505	57,005	70,302	56,691	60	112
Acid	65,146	44,371	63,683	41,912	35	104
Plastics	22,284	21,923	14,315	17,717	3,064	1,237
Paper	18,696	18,597	15,572	16,364	532	208
Sludge	21,762	16,510	16,969	13,103	3,221	1,894
Alkali	8,161	11,721	7,545	7,200	79	52
Glass / Ceramics	8,845	7,821	7,482	7,389	898	338
Oil	6,936	5,841	5,504	4,987	107	78
Others	9,024	9,549	6,724	7,388	967	199
Total	231,359	193,338	208,096	172,751	8,963	4,222

Waste in Global Regions

(Unit: tons)

	Generation	Recycling	Final disposal	Recycling Rate
Japan	193,338	172,751	4,222	97.6%
Americas	50,126	33,345	15,881	67.7%
Europe	20,871	14,047	5,256	72.8%
China	56,603	43,757	8,019	84.5%
Asia and Oceania	107,908	75,449	28,845	72.3%

Air and Water Quality

Emissions to the Air and Water (Japan)

(Unit: tons)

Air	Total NOx Emissions	2,090
	Total SOx Emissions	276
Water	COD Load	362
	Nitrogen Load	1,634
	Phosphorus Load	59

Recycling of End-of-life Products

The status of overall recycling conducted by Matsushita Electric Industrial Co., Ltd. as a manufacturer during April 1, 2001 to March 31, 2002 under the Specific Household Appliance Recycling Law*.
*Appliances subject to the law are air conditioners, TVs, refrigerators, and washing machines.

Overview of Recycling for Specific Household Appliances

(Numbers after the decimal point are truncated.)

	Air conditioner	Television	Refrigerator	Washing machine
Collected units at designated points (thousand units)*1	223	655	528	393
Treated units for recycling (thousand units)*1*2	218	635	520	386
Treated amount for recycling (tons)*2	9,966	17,892	31,746	11,577
Recycled amount (tons)	7,527	11,962	18,366	6,534
Recycling rate (%)	75	66	57	56

*1 "Collected units at designated points" and "Treated units for recycling" does not include wrongly delivered units whose responsible manufacturers are unknown.
*2 "Treated units for recycling" and "Treated amount for recycling" refer to the total number of units and total weight of specific household appliances that have been treated for recycling in 2001.

Total amount of materials treated for paid or free recycling to be reused

(Unit: tons) (Numbers after the decimal point are truncated.)

	Air conditioner	Television	Refrigerator	Washing machine
Iron	4,860	1,539	15,355	5,866
Copper	247	504	49	49
Aluminum	209	60	3	19
Nonferrous metal and iron mixture	2,162	45	2,848	573
Cathode ray tube glass	—	9,353	—	—
Other by-products with value*3	49	461	111	27
Total	7,527	11,962	18,366	6,534

*3 "Other by-products with value" refers to printed circuit boards and other plastics.

Total amount of collected refrigerants

(Unit: kg) (Numbers after the decimal point are truncated.)

	Air conditioner	Television	Refrigerator	Washing machine
Total	90,084	—	24,066	—

Environmental Data from Manufacturing Sites

NOx: Nitrogen oxides
P.M.:Particulate matter
pH:Hydrogen ion concentration
COD: Chemical oxygen demand
SOx: Sulfur [sulphur] oxides
BOD: Biochemical oxygen demand
SS: Suspended solids concentration

AVC Company, Matsushita Electric Industrial Co., Ltd. Kadoma Site (North)

Major Products: AV core associated equipments, Avionics associated equipments, Car associated equipments

Location: 2-15 Matsuba-cho, Kadoma, Osaka, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	150	81	90	2/year
	Boiler2	150	34	36	2/year
	Boiler3	150	65	94	2/year
SO_x (Nm^3/h)	Boiler1	*1			
	Boiler2				
	Boiler3				
P.M. (g/Nm^3)	Boiler1	0.1	0.001	0.001	1/year
	Boiler2	0.1	0.001	0.001	1/year
	Boiler3	0.1	0.001	0.001	1/year

Measurements are from 3 major facilities

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	13.1

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	3.7
Nitrogen	8.65
Phosphorus	0.19

Data does not include drainage into the sewage system

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
Violation due to loud background noise

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.7–8.7	7.3	8.1	1/3months
BOD		600	161	230	1/3months
COD		—	53	53	1/year
SS		600	46	70	1/3months
Extractive substance in n-hexane	Mineral Oil	5	ND	ND	1/year
	Animal and Vegetable oil	30	6.8	9.9	1/3months
Phenol		5	ND	ND	1/year
Copper		3	ND	ND	1/year
Zinc		5	0.14	0.14	1/year
Soluble Iron		10	1.2	1.2	1/year
Soluble Manganese		10	0.035	0.035	1/year
Total Chromium		2	ND	ND	1/year
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		240	8.8	8.8	1/year
Phosphorus		32	1.2	1.2	1/year
Iodine consumption		220	10	10	1/year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:
cadmium/compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound.

Note:" /compound" stands for " and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Lead	8,292.7	0	0	0	0	3,003.7	0	5,289.0
Toluene	4,215.9	74.1	0	0	263.9	48.6	3,806.0	23.3
Cobalt	2,394.0	0	0	0	0	2,154.6	0	239.4
Xylene	1,090.6	873.3	0	0	0	217.3	0	0
Silver	393.3	0	0	0	142.0	234.0	0	17.3
Hydrogen fluoride	322.5	0	0	0	0	322.5	0	0
Bisphenol epoxy resin	82.5	0	0	0	0	0	0	82.5
Tellurium	29.2	0	0	0	0	17.5	1.8	9.9
Antimony	24.1	1.0	0	0	0	3.5	1.8	17.8
Tetrachloro difluoroethane	15.0	15.0	0	0	0	0	0	0
1,1,1,2-tetrafluoroethane	11.0	11.0	0	0	0	0	0	0
Tetrahydrofuran	10.5	0	0	0	10.5	0	0	0
Acetonitrile	6.0	0	0	0	6.0	0	0	0
Antimony pentaoxide	2.3	0	0	0	0	0	0	2.3
Methyl methacrylate	2.0	0	0	0	0	0	0	2.0
Chromium and chromium (III) compound	1.7	0	0	0	0.6	1.0	0	0.1
Chloroform	1.0	0	0	0	1.0	0	0	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values are lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Home Appliance & Housing Electronics Company, Matsushita Electric Industrial Co., Ltd. Nara Site

Major Products: Microwaves, Gas and petrol equipments, Electric heating equipments

Location: 800 Tsutsui-cho, Yamato-koriyama, Nara, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	150	60	66	2/year
	Boiler2	150	53	55	2/year
	GE Compressor	1,000	57.5	59	2/year
SO_x (Nm^3/h)	Boiler1	*1			
	Boiler2				
	GE Compressor				
P.M. (g/Nm^3)	Boiler1	0.10	0.001	0.001	2/year
	Boiler2	0.10	0.001	0.001	2/year
	GE Compressor	0.05	0.001	0.001	2/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	4.8

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	—
Nitrogen	—
Phosphorus	—

Data does not include drainage to the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5 – 9	7.9	8.3	1/month
BOD		1,500	7.15	20.8	1/month
COD		—	—	—	—
SS		1,500	17.7	27.2	1/month
Extractive substance in n-hexane	Mineral Oil	5	2.5	2.5	1/month
	Animal and vegetable oil	30	2.5	2.5	1/month
Phenol		5	ND	ND	1/year
Copper		3	ND	ND	1/year
Zinc		5	0.17	0.32	1/month
Soluble Iron		10	0.2	0.44	1/month
Soluble Manganese		10	ND	ND	1/year
Total Chromium		2	ND	ND	1/year
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		240	3.2	3.2	1/year
Phosphorus		32	14	14	1/year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:
cadmium/compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for " and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Methylenebis(4,1-phenylene) diisocyanate	82,053	0	0	0	0	0	0	82,053
Lead solder	18,968	0	0	0	8.3	6,540.1	0	12,420
Toluene	9,515.4	9,420.9	0	0	94.5	0	0	0
Antimony trioxide	4,622.8	0	0	0	5.0	100.5	0	4,517.3
Xylene	2,453.3	2,450.8	0	0	2.5	0	0	0
Basic silicate	1,362.4	0	0	0	1.2	24.5	0	1,336.7
Ethylbenzene	304.3	304.3	0	0	0	0	0	0
Silver	219.0	0	0	0	1.0	0	0	218.0
Chlorodifluoromethane	100.0	0	0	0	0	0	0	100.0
Boric acid	80.0	0	0	0	80.0	0	0	0
Lead stearate	74.4	0	0	0	0.1	0.9	0	73.4
Potassium acid fluoride	49.7	0	0	0	49.7	0	0	0
Di-n-butyl phthalate	39.4	39.4	0	0	0	0	0	0
Bis(2-ethylhexyl) phthalate	31.2	0	0	0	0	0	0	31.2
Chromic(III) oxide	23.2	0	0	0	0	0.6	0	22.6
Polymer of 4,4'-isopropylidenediphenol and 1-chloro-2,3-epoxypropane	20.0	0	0	0	0	0	0	20.0
Acetonitrile pentaoxide	18.4	0	0	0	0	0.6	0	17.8
N,N-dimethylformamide	21.5	21.5	0	0	0	0	0	0
Others	47.2	1.1	0	0	8.3	0.1	0	37.7

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Air-Conditioner Company, Matsushita Electric Industrial Co., Ltd. Kusatsu Site

Major Products: Air conditioners, Air conditioner compressors, Car air conditioner compressors

Location: 2-3-1-1 Noji Higashi, Kusatsu, Shiga, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Cold/hot water generator 1	150	53	53.4	2/year
	Cold/hot water generator 2	150	26	27.3	2/year
	Gas engine	2,000	257	266.8	2/year
SO_x (Nm^3/h)	Cold/hot water generator 2	*1			
	Cold/hot water generator 2				
	Gas engine				
P.M. (g/Nm^3)	Cold/hot water generator 1	0.1	0.0017	0.0017	1/year
	Cold/hot water generator 2	0.1	0.0019	0.0019	1/year
	Gas engine	0.05	0.0022	0.0022	1/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	1.8

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.8
Nitrogen	0.3
Phosphorus	0

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.0-9.0	7.3	7.7	1/month
BOD		600	283	469	1/month
COD		600	187	386	1/month
SS		600	37	98	1/month
Extractive substance in n-hexane	Mineral Oil	5	ND	ND	1/month
	Animal and vegetable oil	30	12.967	24.7	1/month
Phenol		5	0.02	0.02	1/year
Copper		3	0.018	0.05	1/month
Zinc		5	0.089	0.15	1/month
Soluble Iron		10	2.145	8.7	1/month
Soluble Manganese		10	0.13	0.24	1/month
Total Chromium		2	ND	ND	1/month
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		60	33.1	50.4	1/month
Phosphorus		10	0.58	1.21	1/month
Iodine consumption		220	20.9	36.3	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:cadmium and its compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen), antimony, Nickel.

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Difluoromethane	245tons	579.4	0	0	0	0	2,585.4	242tons
Pentafluoroethane	245tons	579.4	0	0	0	0	2,585.4	242tons
Chlorodifluoromethane	174tons	793.0	0	0	0	0	2,847.0	170tons
1,1,1,2-tetrafluoroethane	1,890.0	1,495.0	0	0	0	0	88.0	307.0
1,1-dichloro-1-fluoroethane	1,202.0	881.0	0	0	321.0	0	0	0
Cyclohexylamine	1,048.0	0	0	1,048.0	0	0	0	0
Silver	1,013.1	0	0	0	0	1.9	0	1,011.2
2,6-di-ter-butyl-4-methyl phenol (BHT)	775.0	0	0	0	12.2	0.6	0	762.2
Xylene	765.4	392.4	0	0	373.0	0	0	0
1,3-dichloro-1,1,2,2,3-pentafluoropropane	618.5	618.5	0	0	0	0	0	0
2-aminoethanol	613.2	0	0	598.5	14.7	0	0	0
3-3-dichloro-1,1,1,2,2-pentafluoropropane	506.5	506.5	0	0	0	0	0	0
Poly(oxyethylene) alkyl ether	470.0	0	0	470.0	0	0	0	0
N,N-dimethylformamide	250.0	128.0	0	0	122.0	0	0	0
Lead	240.0	0	0	0	0	0	0	240.0
Dioxane	143.0	143.0	0	0	0	0	0	0
Ethylenediaminetetraacetic acid	100.0	0	0	100.0	0	0	0	0
Boron	99.0	0	0	89.1	9.9	0	0	0
Manganese	88.1	0	0	0	0	0	0	88.1
Others	249.5	13.3	0	140.4	24.6	0	0	71.2

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Motor Company, Matsushita Electric Industrial Co., Ltd. Takefu Site

Major Products: Air conditioning motors, Electric appliance and equipment motors, Fan motors, Industrial motors, Electric bicycle motors

Location: 20-1 Imajuku-cho, Takefu, Fukui, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Electric generator 1	950	650	800	2/year
	Electric generator 2	950	760	860	2/year
	Electric generator 3	950	800	880	2/year
SO_x (Nm^3/h)	Electric generator 1	K-value= 7.50	0.10	0.13	2/year
	Electric generator 2		0.12	0.14	2/year
	Electric generator 3		0.12	0.13	2/year
P.M. (g/Nm^3)	Electric generator 1	0.08	0.02	0.029	2/year
	Electric generator 2	0.08	0.02	0.029	2/year
	Electric generator 3	0.08	0.020	0.020	2/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	2.4
NO_x	139.9

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	—
Nitrogen	—
Phosphorus	—

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
Not subject to measurement

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	6.8	7.0	1/month
BOD		50	1.2	4.3	1/month
COD		—	—	—	—
SS		70	3	6	1/month
Extractive substance in n-hexane	Mineral Oil	5	0.8	2.8	1/month
	Animal and vegetable oil	—	—	—	—
Phenol		5	0.05	0.05	1/year
Copper		3	0.1	0.1	2/year
Zinc		5	0.1	0.1	2/year
Soluble Iron		10	0.2	0.2	1/year
Soluble Manganese		10	0.1	0.1	1/year
Total Chromium		2	0.02	0.02	1/year
Coliform bacteria count (number/m^3)		3,000	22	22	1/year
Nitrogen		—	—	—	—
Phosphorus		—	—	—	—

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram simazine, thiobencarb, benzene, selenium/compound.

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Styrene (monomer)	60,550.6	3,039.6	0	0	0	0	0	57,511
Bis(2-ethylhexyl) phthalate	11,873	11,873	0	0	0	0	0	0
Toluene	8,798.2	8,798.2	0	0	0	0	0	0
2-amino-5-nitrobenzonitrile	3,742.2	3,742.2	0	0	0	0	0	0
Lead	2,929.2	0	0	0	0	0	0	2,929.2
Xylene	2,570.7	2,570.7	0	0	0	0	0	0
Methyl methacrylate	1,363.5	1,363.5	0	0	0	0	0	0
Ethylbenzene	1,049.4	1,049.4	0	0	0	0	0	0
1,3,5,7-tetraazatricyclo [3.3.1.13.7]decane	649.3	32.6	0	0	0	0	0	616.7
Phenol	161.9	8.1	0	0	0	0	0	153.8
1,3,5-trimethylbenzene	148.0	148.0	0	0	0	0	0	0
2-aminoethanol	91.0	91.0	0	0	0	0	0	0
1,1-dichloro-1-fluoroethane	86.0	86.0	0	0	0	0	0	0
4,4'-isopropylidenediphenol	64.1	64.1	0	0	0	0	0	0
1,1,1,2-tetrafluoroethane	30.0	30.0	0	0	0	0	0	0
Methylenebis (4,1-phenylene) diisocyanate	22.1	22.1	0	0	0	0	0	0
2-imidazolidinethione	13.2	13.2	0	0	0	0	0	0
Formaldehyde	8.9	8.9	0	0	0	0	0	0
Silver	4.5	0	0	0	0	0	0	4.5

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)

Semiconductor Company, Matsushita Electric Industrial Co., Ltd. Tonami site

Major Products: System LSIs, CCDs, Analog LSIs

Location: 271 Higashi-kaihatsu, Tonami, Toyama, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Gas turbine 1	65.0	45.7	50.0	2/year
	Gas turbine 2	65.0	45.7	52.0	2/year
	Gas turbine 3	65.0	52.0	59.0	2/year
SO_x (Nm^3/h)	Gas turbine 1	K-value =17.5	<0.01	<0.01	2/year
	Gas turbine 2		<0.01	<0.01	2/year
	Gas turbine 3		<0.01	<0.01	2/year
P.M. (g/Nm^3)	Gas turbine 1	0.02	0.001	0.001	2/year
	Gas turbine 2	0.02	<0.001	<0.001	2/year
	Gas turbine 3	0.02	<0.001	<0.001	2/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.01
NO_x	183.7

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	2.6
Nitrogen	3.1
Phosphorus	0.9

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
Not subject to measurement

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *1	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8–8.6	7.1	7.4	1/month
BOD		25(20)	4.2	8.0	1/month
COD		–	1.7	5	1/month
SS		90(70)	1.6	6.0	1/month
Extractive substance in n-hexane	Mineral Oil	5	<1.0	<1.0	1/month
	Animal and vegetable oil	15	0.0	<1.0	–
Phenol		1	ND	ND	3/year
Copper		1	<0.01	0.01	1/month
Zinc		5	0.04	0.09	1/month
Soluble Iron		10	<0.01	0.03	1/month
Soluble Manganese		10	<0.01	0.04	1/month
Total Chromium		2	<0.001	<0.001	1/month
Coliform bacteria count (number/m^3)		3,000	0	0	1/month
Nitrogen		25	2.0	4.9	1/month
Phosphorus		2	0.6	2.0	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Hydrofluoric acid	59,240	0	8,160	0	5,990	0	0	45,090
Hexafluoroethane, perfluoroethane	25,484	17,839	0	0	0	0	0	7,645.1
N,N-dimethylformamide	21,899	0	438.0	0	20,147	0	1,314.0	0
Dinitrogen monoxide	3,600.0	2,520.0	0	0	0	0	0	1,080.0
Tungsten hexafluoride	2,390.0	1,673.0	0	0	0	0	0	717.0
Sulfur hexafluoride	2,345.5	1,641.8	0	0	0	0	0	703.7
Tetrafluoromethane, perfluoromethane	1,632.8	1,143.0	0	0	0	0	0	489.8
Trifluoromethane	976.4	683.5	0	0	0	0	0	292.9
Chlorine	850.9	0	0	0	595.6	0	0	255.3
Trans-1,2-dichloroethylene	303.6	0	0	0	0	0	0	303.6
Octafluorocyclobutane, tetrafluorocyclobutane	294.1	205.9	0	0	0	0	0	88.2
Chlorine trifluoride	196.4	0	0	0	137.5	0	0	58.9
Fluorine	168.7	33.6	17.7	0	102.9	0	0	14.5
Difluoromethane	43.6	30.5	0	0	0	0	0	13.1
Hydrogen chloride (gas)	27.3	0	0	0	19.1	0	0	8.2
Poly(oxyethylene) alkyl ether	16.0	0	0	0	0	0	16.0	0
Boron trifluoride	12.7	0	0	0	12.6	0	0	0.1
Arsenic	5.6	0	0	0	5.5	0	0	0.1
Diborane	2.5	1.7	0	0	0	0	0	0.8
Arsine	1.5	0	0	0	1.5	0	0	0
N,N-dimethyl acetamide	1.2	0	0.1	0	1.0	0	0.1	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 The values in ( ) indicate daily average.

Lightning Company/Display Device Company, Matsushita Electric Industrial Co., Ltd. Takatsuki Site

Major Products: Fluorescent lamps, Bulbs, CRTs, Plasma display panels

Location: 1-1 Saiwai-cho, Takatsuki, Osaka, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm) *1	Continuous glass melting furnace	1,300	738	763	2/year
	CRT exhaust furnace	240	146	164	2/year
	Compact through flow boiler	60	33	38	2/year
SO_x (Nm^3/h)	Continuous glass melting furnace	K-value =1.75	<0.01	<0.01	2/year
	CRT exhaust furnace		–	–	–
	Compact through flow boiler		<0.01	<0.01	2/year
P.M. (g/Nm^3)	Continuous glass melting furnace	0.2	0.035	0.04	2/year
	CRT exhaust furnace	0.2	0.01	0.01	2/year
	Compact through flow boiler	0.1	0.01	0.01	2/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	10.3

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	6.6
Nitrogen	13.2
Phosphorus	0.8

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *2	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8–8.6	7.0	7.5	more than1 /year
BOD		15(10)	3.9	9	more than1 /year
COD		15(10)	3.7	15	more than1 /year
SS		50(40)	6.0	43	more than1 /year
Extractive substance in n-hexane	Mineral Oil	2	<1	<1	more than1 /year
	Animal and vegetable oil	10	*3		
Phenol		1	–	ND	more than1 /year
Copper		3	0.01	0.01	more than1 /year
Zinc		5	0.038	0.07	more than1 /year
Soluble Iron		10	0.183	0.26	more than1 /year
Soluble Manganese		10	0.05	0.07	more than1 /year
Total Chromium		2	0.005	0.01	more than1 /year
Coliform bacteria count (number/m^3)		3,000	71.1	450	more than1 /year
Nitrogen		120(60)	6.0	15	more than1 /year
Phosphorus		16(8)	0.24	0.7	more than1 /year
Molybdenum		0.07	0.021	0.051	more than1 /year
Nickel		0.01	0.003	0.007	more than1 /year
Antimony		0.002	0.0016	0.0028	more than1 /year
Toluene		0.6	0.05	2.4	more than1 /year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium /compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic /compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Toluene	52,229	1,982.9	0	0	3,165.6	46,798	282.7	0
Antimony trioxide	49,200	0	0	0	0	0	0	49,200
Lead(II) monoxide	43,705	0	4.3	3.0	4.6	8,619.8	0	35,073
Other bromic flame retardant	26,418	0	0	0	0	2,113.5	0	24,304
Hydrofluoric acid	16,763	0	447.8	0	0	2,741.1	13,574	0
Lead solder	8,229.6	0	0	0	74.7	1.5	0	8,153.4
Aluminum sulfate	7,110.0	0	1,586.0	0	0	5,524.0	0	0
Silver	4,847.9	0	0	144.8	0	4,014.6	0	688.5
2-aminoethanol	3,941.8	0	0	0	0	15.8	3,926.0	0
Zinc oxide	3,265.4	0	0	0	0	63.5	0	3,201.9
Boron oxide	1,777.0	0	0	25.7	43.6	489.4	0	1,218.3
Xylene	1,397.1	16.6	0	0	0	43.3	1,337.2	0
Manganese	757.1	0	0	0	18.0	63.4	0	675.7
Zinc sulfide	628.1	0	0	0	0	188.3	0	439.8
Nickel	581.0	0	0	0	0	23.0	0	558.0
Barium carbonate	532.8	0	0	0	15.9	86.3	0	430.6
Mercury	422.8	2.0	0	0	0	17.2	0	403.6
Molybdenum	382.8	0	0.7	0	3.2	353.1	0	25.8
Antimony	339.7	0	0	0	9.0	31.6	0	299.1
Others	678.1	0	136.5	0	14.3	15.2	5.3	506.8

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 The regulation values for NOx are measured under the oxygen concentration of 0%.
*2 The values in ( ) indicate daily average.
*3 This item is measured when mineral oil is detected over 1mg/l.

Factory Automation Company, Matsushita Electric Industrial Co., Ltd. Kofu Site

Major products: Electronic component mounting equipments

Location: 1375 Sukiawara, Showa-cho, Nakakoma, Yamanashi, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	150	74	86	2/year
	Boiler2	150	63	67	2/year
	Boiler3	150	68	77	2/year
SO_x (Nm^3/h)	Boiler1	6.25	0.014	0.015	2/year
	Boiler2	6.25	0.008	0.009	2/year
	Boiler3	6.45	0.005	0.005	2/year
P.M. (g/Nm^3)	Boiler1	0.1	<0.002	<0.002	2/year
	Boiler2	0.1	<0.002	<0.002	2/year
	Boiler3	0.1	<0.002	<0.002	2/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.04
NO_x	0.46

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	—
Nitrogen	—
Phosphorus	—

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
Not subject to measurement

Noise & Vibration

Violation of standards and its description
Not subject to measurement

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5-9	8.3	8.4	2/year
BOD		600	130	150	2/year
COD		—	—	—	—
SS		600	57	57	2/year
Extractive substance in n-hexane	Mineral Oil	5	2	2	2/year
	Animal and Vegetable oil	10	4.4	7.4	1/year
Phenol		5	ND	ND	2/year
Copper		1	ND	ND	2/year
Zinc		1	0.058	0.069	2/year
Soluble Iron		1	0.13	0.2	2/year
Soluble Manganese		1	0.07	0.13	2/year
Total Chromium		0.5	ND	ND	2/year
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		—	—	—	—
Phosphorus		—	—	—	—
Iodine consumption		220	33	35	2/year
Water temperature (℃)		≦45	24	24	2/year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit:kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Lead solder	101.0	0	0	0	0	30.0	0	71.0

"Recycled" includes paid recycling, as well as free and inverse onerous contract."Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit.
Frequency of measurement is shown as: (number of times measured) / (time period)

Matsushita Communication Industrial Co., Ltd. Shirakawa Site

Major products: CCVE cameras, Core cameras, In-vehicle cameras, Microphones

Location: 15 Ushishimizu, Shirasaka, Shirakawa, Fukushima, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	250	53	53	1/year
	Boiler2	180	64	64	1/year
SO_x (Nm^3/h)	Boiler1	K-value =17.5	0.006	0.006	1/year
	Boiler2		0.001	0.001	1/year
P.M. (g/Nm^3)	Boiler1	0.3	0.003	0.003	1/year
	Boiler2	0.3	0.022	0.022	1/year

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	0.2

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.3
Nitrogen	—
Phosphorus	—

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	7.3	7.7	6/year
BOD		20	3.1	7.0	6/year
COD		20	6.5	10.6	6/year
SS		50	5.8	11.6	6/year
Extractive substance in n-hexane	Mineral Oil	10	0.5	0.5	6/year
	Animal and vegetable oil	10	0.5	0.5	6/year
Phenol		1	<0.1	<0.1	1/2years
Copper		2	<0.1	<0.1	1/2years
Zinc		4	<0.1	<0.1	1/2years
Soluble Iron		10	<0.1	<0.1	1/2years
Soluble Manganese		10	<0.1	<0.1	1/2years
Total Chromium		2	<0.1	<0.1	1/2years
Coliform bacteria count (number/m^3)		3,000	9.7	23	6/year
Nitrogen		—	—	—	—
Phosphorus		—	—	—	—

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, fluorine/compound.

Note:"/compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Lead	293.8	0	0	0	0	146.9	0	146.9
Nickel	130.0	0	0	0	0	41.2	0	88.8
Silver	16.8	0	0	0	0	8.4	0	8.4
1,1,1,2-tetrafluoroethane	1.8	1.8	0	0	0	0	0	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)

Matsushita Electronic Components Co., Ltd. Uji Site

Major Products: Aluminum electrolytic capacitor, Tantalum electrolytic capacitor, Functional aluminum electrolytic capacitor, Electric double layer capacitor

Location: 25 Kohatanishinaka, Uji, Kyoto, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Gas turbine	70	27	32	1/2months
	Boiler1	130	38	45	1/6months
	Boiler2	180	6.6	7.7	1/6months
SO_x (Nm^3/h)	Gas turbine	*1			
	Boiler1				
	Boiler2				
P.M. (g/Nm^3)	Gas turbine	0.05	<0.002	<0.002	1/2months
	Boiler1	0.1	0.001	0.001	1/6months
	Boiler2	0.1	0.002	0.003	1/6months

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.0058
NO_x	21.67

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	25.8
Nitrogen	140
Phosphorus	5.5

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *2	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8–8.6	7.3	7.5	1/month
BOD		25(20)	7.35	13	1/month
COD		25(20)	7.24	10	1/month
SS		90(70)	6.1	16	1/month
Extractive substance in n-hexane	Mineral Oil	5	0.54	0.9	1/month
	Animal and Vegetable oil	20	—	—	—
Phenol		1	<0.1	<0.1	1/month
Copper		3	0.0019	0.006	1/month
Zinc		5	0.033	0.14	1/month
Soluble Iron		10	<0.02	<0.02	1/month
Soluble Manganese		10	0.030	0.07	1/month
Total Chromium		2	<0.02	<0.02	1/month
Coliform bacteria count (number/m^3)		3,000	67	380	1/month
Nitrogen		120(60)	39.3	51	1/month
Phosphorus		16(8)	1.54	3.6	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, trichloroethylene, tetrachloroethylene, carbon tetrachloride, 1,1,1-trichloroethane, fluorine/compound.

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Aluminum chloride hexahydrate	1,298tons	0	0	0	0	1,298tons	0	0
Aluminum sulfate	862.4tons	0	0	0	0	862.4tons	0	0
Ethylene glycol	232.7tons	0	17.5	0	0	2,300	0	230.4tons
Oxalic acid	45,348	0	1,133.7	0	0	44,214	0	0
Manganese(Ⅳ) dioxide	14,008	0	301.9	0	7,372.8	0	0	6,333.2
Polyvinyl chloride and its mixture	11,961	0	0	0	2,392.2	0	0	9,568.8
Silver	3,115.1	0	0	0	0	738.9	0	2,376.2
Boric acid	2,400.5	0	797.2	0	0	1,603.3	0	0
Toluene	1,424.8	854.9	0	0	569.9	0	0	0
Bis(2-ethylhexyl) phthalate	1,026.9	0	0	0	205.4	0	0	821.5
Antimony trioxide	848.2	0	0	0	695.5	0	0	152.7
Other bromic flame retardant	525.8	0	0	0	431.2	0	0	94.6
Xylene	392.8	353.5	0	0	39.3	0	0	0
Lead solder	255.2	0	0.5	0	103.6	116.1	0	35.0
Others	779.4	163.0	159.8	0	108.0	215.5	0	133.1

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND(not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).
*2 The values in ( ) indicate daily average.

Matsushita Industrial Equipment Co., Ltd. Toyonaka Site

Main Products: General welding equipments, Input station equipments, Industrial robots, ME/emanation equipments, FA systems

Location: 3-1-1 Inatsu-cho, Toyonaka, Osaka, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Gas engine generator	2,000	13	13	1/year
	Boiler	180	47.4	58	2/year
	Resin treatment facility	—	23	23	2/year
SO_x (Nm^3/h)	Gas engine generator	0.3	0.001	0.001	1/year
	Boiler	0.3	0.001	0.001	2/year
	Resin treatment facility	—	—	—	—
P.M. (g/Nm^3)	Gas engine generator	0.05	0.0028	0.0028	1/year
	Boiler	0.15	0.009	0.028	2/year
	Resin treatment facility	0.1	0.0004	0.0005	2/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.7
NO_x	2.6

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	—
Nitrogen	—
Phosphorus	—

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.7–8.7	7.7	7.9	2/year
BOD		300	47	47	1/year
COD		—	40	40	2/year
SS		300	55	69	2/year
Extractive substance in n-hexane	Mineral Oil	5	ND	ND	1/year
	Animal and vegetable oil	30	2.4	2.6	2/year
Phenol		5	ND	ND	1/year
Copper		3	0.03	0.03	1/year
Zinc		5	0.11	0.11	1/year
Soluble Iron		10	0.12	0.12	1/year
Soluble Manganese		10	0.05	0.05	1/year
Total Chromium		2	ND	ND	1/year
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		150	74	74	1/year
Phosphorus		20	5.3	5.3	1/year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:cadmium/compound, cyaniccompound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound.

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Xylene	4,369.7	2,488.8	0	0	0	0	1,880.9	0
Lead	1,005.7	0	0	0	12.6	26.4	0	966.7
Toluene	470.9	221.3	0	0	0	0	249.6	0
Hydrazine	42.1	0	0	0	0	0	42.1	0
Zinc oxide	30.0	0	0	0	30.0	0	0	0
Ethylbezene	24.3	11.4	0	0	0	0	12.9	0
Cadmium	11.3	0	0	0	0.1	0	0	11.2
Silver bromide	1.2	0	0	0	0.4	0	0	0.8
Silver chloride	0.9	0	0	0	0.3	0	0	0.6

"Recycled" includes paid recycling, as well as free and inverse onerous contract."Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)

Matsushita Battery Industrial Co., Ltd. Moriguchi Site B Block

Major Products: Lithium primary batteries, Lithium ion rechargable batteries

Location: 1-1 Matsushita-cho, Moriguchi, Osaka, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	120	98.3	110	2/year
	Boiler2	78	49.6	58	2/year
	Boiler3	60	48.0	55	2/year
SO_x (Nm^3/h)	Boiler1	*1			
	Boiler2				
	Boiler3				
P.M. (g/Nm^3)	Boiler1	0.05	0.001	0.001	1/year
	Boiler2	0.05	0.001	0.001	1/year
	Boiler3	0.05	0.001	0.001	1/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	—
NO_x	8.0

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	—
Nitrogen	—
Phosphorus	—

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.7-8.7	7.1	6.5-7.7	Continuously
BOD		300	128	290	2/month
COD		—	—	—	—
SS		300	3.8	11	2/month
Extractive substance in n-hexane	Mineral Oil	5	<0.5	2.2	2/month
	Animal and Vegetable oil	—	—	—	—
Phenol		—	—	—	—
Copper		—	—	—	—
Zinc		5	<0.01	0.072	2/month
Soluble Iron		10	0.1	0.17	1/month
Soluble Manganese		10	0.07	0.21	1/month
Total Chromium		—	—	—	—
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		—	—	—	—
Phosphorus		—	—	—	—

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: lead/compound, total mercury, trichloroethylene, cis-1,2-dichloroethylene, boron/compound, fluorine/compound.

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Manganese(IV) dioxide	327,000	0	0	0	47,716	30,796	0	248,488
Cobalt(Ⅱ) oxide	74,039.2	0.2	0	0	0	74,039	0	0
Toluene	4,270.3	3,307.4	0	0	0	948.0	0	14.9
Divanadium pentaoxide	1,853.1	0	0	0	92.7	0	0	1,760.4
Silver(Ⅰ) oxide	1,043.1	0	0	0	0	52.2	0	990.9
Mercury	435.0	0	0	0	0	9.0	0	426.0
Cadmium sulfide	298.8	0	0	0	7.2	0	0	291.6
Zinc oxide	161.1	0	0	0	0	8.1	0	153.0
Tellurium	135.0	0	0	0	3.2	0	0	131.8
Lead solder	117.5	0	0	0	0	17.7	0	99.8
Cadmium	115.0	0	0	0	0	0	0	115.0
Copper(Ⅰ) oxide	89.1	0	0	0	4.5	0	0	84.6
Xylene	82.4	81.7	0	0	0	0.5	0	0.2
Cadmium chloride	30.0	0	0	0	0.7	0	0	29.3
Indium	25.0	0	0	0	0	0	0	25.0
Acetonitrile	20.5	19.8	0	0	0.5	0	0	0.2
Phenol	7.0	7.0	0	0	0	0	0	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Matsushita Refrigeration Company Kusatsu Site

Major Products: Refrigerators, Vending machines, Heat exchanger units for refrigerator

Location: 3-4-74 Noji-higash, Kusatsu, Shiga, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	130	63	78	6/year
	Drying oven	230	≦25	≦49	2/year
	Boiler2	150	52	88	2/year
SO_x (Nm^3/h)	Boiler1	—	0.0031	0.0031	2/year
	Drying oven	4.21	≦0.0048	≦0.0064	2/year
	Boiler2	1.01	0.0029	0.0051	2/year
P.M. (g/Nm^3)	Boiler1	0.3	0.0059	0.0087	6/year
	Drying oven	0.4	≦0.0025	≦0.0028	2/year
	Boiler2	0.4	≦0.0047	≦0.0064	1/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.2
NO_x	7.7

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	4.50
Nitrogen	2.48
Phosphorus	0.20

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.0-9.0	7.5	8.4	1/week
BOD		600	132	400	1/week
COD		600	65.6	152	1/week
SS		600	108	474	1/week
Extractive substance in n-hexane	Mineral Oil	5	1.1	3.8	1/week
	Animal and Vegetable oil	30	18.4	21.0	1/week
Phenol		5	0.5	0.5	1/year
Copper		3	0.04	0.04	1/year
Zinc		5	0.09	0.68	1/week
Soluble Iron		10	0.32	0.32	1/year
Soluble Manganese		10	0.03	0.03	1/year
Total Chromium		2	0.02	0.02	1/year
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		60	35.0	50	1/week
Phosphorus		10	4.49	8.20	1/week
Iodine consumption		220	25.4	42	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyaniccompound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Methylenebis(4,1-phenylene) diisocyanate	1,035t	0	0	0	2,362.8	0	0	1,033t
1,1,1,2-tetrafluoroethane	94,655	902.0	0	0	131.0	0	0	93,622
Toluene	41,537.5	3,865.2	0	0	5,270.1	0	32,358.9	43.3
1,1-dichloro-1-fluoroethane	40,100	55.0	0	0	85.0	0	0	39,960
Xylene	36,097	12,814.5	0	0	10,468	0	12,814.6	0
R-407C	15,089	0	0	0	262	0	0	14,827
Ethylbenzene	8,878.3	5,405.3	0	0	2,296.4	0	1,176.6	0
Ethylene glycol	8,681.0	0	0	0	8.7	0	0	8,672.3
Bisphenol-A epoxy resin (liquid form)	5,798.8	0	0	0	0	0	0	5,798.8
Chlorodifluoromethane	4,844.0	0	0	0	393.1	0	0	4,450.9
Lead solder	3,910.3	0	0	0	0	2,225.7	0	1,684.6
Formaldehyde	1,027.0	125.4	0	0	149.6	0	752.0	0
PVC and its compound	814.8	0	0	0	0	0	0	814.8
1,3,5-trimethylbenzene	809.4	2.1	0	0	57.3	0	750.0	0
R-404A	597.0	0	0	0	131.0	0	0	466.0
Barium sulfate	453.8	0	0	0	339.0	0	1.8	113.0
Nickel nitrate	314.4	0	0	0	209.6	0	0	104.8
Poly(oxyethylene) nonylphenol ether	126.1	0	0	0	84.5	0	0	41.6
Zinc oxide	104.1	0	0	0	77.9	0	0.2	26.0
Others	425.8	9.8	0	0	111.4	0	89.4	215.2

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND(not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)

Kyushu Matsushita Electric Co., Ltd. Device Division, Oita Site

Major Products: Motors, Lead frames, Joint equipments

Location: 2111 Ueda, Usa, Oita, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Diesel engine 1	950	545	570	2/year
	Diesel engine 2	950	540	600	2/year
SO_x (Nm^3/h)	Diesel engine 1	5.23	0.17	0.27	2/year
	Diesel engine 2	5.23	0.17	0.26	2/year
P.M. (g/Nm^3)	Diesel engine 1	0.1	0.007	0.01	2/year
	Diesel engine 2	0.1	0.007	0.01	2/year

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	4.24
NO_x	73.67

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.2
Nitrogen	0.5
Phosphorus	0.1

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *1	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	7.3	7.8	1/month
BOD		160(120)	3.0	3.0	4/year
COD		15(10)	1.4	2.9	1/month
SS		15(10)	1.8	5.2	1/month
Extractive substance in n-hexane	Mineral Oil	—	—	—	—
	Animal and Vegetable oil	9	1.0	1.3	1/month
Phenol		—	—	—	—
Copper		3	0.010	0.010	2/year
Zinc		5	0.049	0.052	2/year
Soluble Iron		10	0.056	0.092	2/year
Soluble Manganese		10	0.029	0.048	2/year
Total Chromium		—	—	—	—
Coliform bacteria count (number/m^3)		3,000	30	180	1/month
Nitrogen		120(60)	3.6	7.1	1/month
Phosphorus		16(8)	0.52	1.9	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:
cyaniccompound, lead/compound, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, benzene.

Note:"/compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Potassium cyanide	7,942.0	0	0	0	0	0	7,942.0	0
Lead solder	7,191.0	0	0	0	0	2,876.4	0	4,314.6
Xylene	4,875.0	4,290.0	0	0	0	585.0	0	0
Nickel	2,656.0	0	0	0	0	0	0	2,656.0
Sodium cyanide	1,655.0	0	0	0	0	0	1,655.0	0
Silver	1,457.0	0	0	0	0	0	0	1,457.0
Cuprous cyanide	939.0	0	0	0	0	0	939.0	0
Toluene	510.0	448.8	0	0	0	61.2	0	0
Sulfonic methane	417.0	0	0	0	0	0	0	417.0
Boric acid	253.0	0	0	0	0	253.0	0	0
Nickel sulfate	123.0	0	0	0	0	123.0	0	0
Acrylic acid	0.7	0.1	0	0	0	0	0	0.6

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 The values in ( ) indicate daily average.

Matsushita Seiko Co., Ltd. Kasugai West Site

Major Products: Ceiling built-in exhaust fans, General exhaust fans, Kitchen-hoods, Exhaust fan components

Location: 4017 Shimo Nakata, Takagi-cho, Kasugai, Aichi

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	150	71	88	2/year
	Boiler2	180	120	120	1/year
	Boiler3	150	86	99	2/year
SO_x (Nm^3/h)	Boiler1	1.1	0.001	0.001	2/year
	Boiler2	3.6	0.045	0.045	1/year
	Boiler3	1.1	0.001	0.001	2/year
P.M. (g/Nm^3)	Boiler1	0.1	0.0015	0.002	2/year
	Boiler2	0.3	0.001	0.001	1/year
	Boiler3	0.1	0.0015	0.002	2/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0.3
NO_x	0.4

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.8
Nitrogen	Not subject to measurement
Phosphorus	Not subject to measurement

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
Not subject to measurement

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	7.3	7.6	1/month
BOD		25	2.2	3.0	1/month
COD		25	4.5	5.6	1/month
SS		30	1.6	5.0	1/month
Extractive substance in n-hexane	Mineral Oil	5.0	<1.0	<1.0	1/month
	Animal and Vegetable oil	—	—	—	—
Phenol		—	—	—	—
Copper		—	—	—	—
Zinc		5.0	0.1	0.2	1/month
Soluble Iron		—	—	—	—
Soluble Manganese		—	—	—	—
Total Chromium		—	—	—	—
Coliform bacteria count (number/m^3)		—	—	—	—
Nitrogen		120	9.5	13.0	1/month
Phosphorus		16	0.4	0.5	1/month
Fluorine		8.0	0.3	0.7	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:
cadmium/compound, cyaniccompound, organic phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Management Rank Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Aluminum sulfate	3,433.0	0	0	0	0	3,433.0	0	0
Toluene	221.0	221.0	0	0	0	0	0	0
Lead solder	213.0	0	0	0	0	4.3	0	208.7
Xylene	33.0	33.0	0	0	0	0	0	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND(not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)

Matsushita Graphic Communication Systems, Inc. Niigata Site

Major Products: FAX, PPC, Electronic print boards, Letter boards, Consumables

Location: 1260 Kounosu-cho, Ojiya, Niigata, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	150	55	55	2/year
	Boiler2	150	55	59	2/year
	Boiler3	150	31	35	2/year
SO_x (Nm^3/h)	Boiler1	*1			
	Boiler2				
	Boiler3				
P.M. (g/Nm^3)	Boiler1	0.1	0.01	0.01	2/year
	Boiler2	0.1	0.01	0.01	2/year
	Boiler3	0.1	0.01	0.01	2/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	0

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.1
Nitrogen	0.2
Phosphorus	0.04

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
No violation

Noise & Vibration

Violation of standards and its description
No violation

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8–8.6	7.1	7.2	2/year
BOD		40	3.5	5	2/year
COD		160	11.5	12	2/year
SS		90	6	9	2/year
Extractive substance in n-hexane	Mineral Oil	5	1	1	2/year
	Animal and vegetable oil	30	1	1	2/year
Phenol		1	0.01	0.01	2/year
Copper		2	0.01	0.01	2/year
Zinc		5	0.075	0.08	2/year
Soluble Iron		10	0.10	0.14	2/year
Soluble Manganese		10	0.02	0.02	2/year
Total Chromium		2	0.04	0.04	2/year
Coliform bacteria count (number/m^3)		3,000	30	30	2/year
Nitrogen		120	29	37	2/year
Phosphorus		16	4	6	2/year

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:cadmium/compound, cyanic compound, organic Phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Control Ranking Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Lead	1,185.1	0	0	0	0	233.1	0	952.0
Methyl methacrylate	31.0	0	0	0	0	10.0	0	21.0
Silver	28.3	0	0	0	0	2.9	0	25.4
Poly(oxyethylene) alkyl ether	4.3	0	0	0	4.3	0	0	0
Boric acid	1.3	0	1.3	0	0	0	0	0
2-imidazolidinethione	0.08	0	0	0	0	0.04	0	0.04

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Matsushita Kotobuki Electronics Industries, Ltd. Matsuyama Site

Major Products: CD-R/RW drives, COMBO drives, DVC-ROM drives, DAT data storages

Location: 2131-1 Minakata, Kawauchi-cho, Onsen-gun, Ehime, Japan

Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	180	68	83	2/year
	Boiler2	180	80	99	2/year
	Boiler3	180	80	99	2/year
SO_x (Nm^3/h)	Boiler1	3	<0.01	<0.01	2/year
	Boiler2	5.3	<0.01	<0.01	2/year
	Boiler3	5.3	<0.01	<0.01	2/year
P.M. (g/Nm^3)	Boiler1	0.3	<0.01	<0.01	2/year
	Boiler2	0.3	<0.01	<0.01	2/year
	Boiler3	0.3	<0.01	<0.01	2/year

Measurements are from 3 major facilities.

Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	ND
NO_x	2.8

Total Emissions to Water (Unit: tons/year)

Item	Total
COD	0.1
Nitrogen	0.5
Phosphorus	0.1

Data does not include drainage into the sewage system.

Odor

Violation of standards and its description
Not subject to measurement

Noise & Vibration

Violation of standards and its description
Not subject to measurement

Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *1	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8–8.6	7.0	7.3	3/month
BOD		160(120)	0.8	1.3	1/month
COD		40(30)	4.9	6.5	3/month
SS		200(150)	0.1	1.0	1/month
Extractive substance in n-hexane	Mineral Oil	5	ND	ND	1/month
	Animal and vegetable oil	30	ND	ND	1/month
Phenol		5	0.015	0.015	1/year
Copper		3	ND	ND	1/year
Zinc		5	0.035	0.035	1/year
Soluble Iron		10	0.09	0.09	1/year
Soluble Manganese		10	0.01	0.01	1/year
Total Chromium		2	ND	ND	1/year
Coliform bacteria count (number/m^3)		3,000	ND	ND	3/month
Nitrogen		120(60)	16.6	24.1	3/month
Phosphorus		16(8)	2.0	3.0	3/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, organic Phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

Chemical Substances (Matsushita Chemical Substances Control Ranking Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Xylene	1,398.0	0	0	0	0	0	0	1,398.0
Silver	919.8	0	0	0	0	88.3	0	831.5
Lead	727.5	0	0	0	0	45.9	0	681.6

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 The values in ( ) indicate daily average.

Victor Company of Japan Ltd. Headquarters/Yokohama site

Major Products: ILA devices, Disk originals, Multi-layer circuit boards

Location: 3-12 Moriya-cho, Kanagawa-ku, Yokohama, Kanagawa, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	60	53	55	1/year
	Boiler2	70	55	59	1/year
	Boiler3	70	59	59	1/year
SO_x (Nm^3/h)	Boiler1	*1			
	Boiler2				
	Boiler3				
P.M. (g/Nm^3)	Boiler1	0.3	0.0068	0.0068	1/year
	Boiler2	0.3	0.0069	0.0069	1/year
	Boiler3	0.3	0.0039	0.0039	1/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	0
NO_x	0.2

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	1.4
Nitrogen	2.8
Phosphorus	0.2

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
Not subject to measurement

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	7.37	7.8	4/month
BOD		60	0.55	5	1/month
COD		60	5.39	17	4/month
SS		90	2.82	13	1/month
Extractive substance in n-hexane	Mineral Oil	5	0.09	1	1/month
	Animal and vegetable oil	10	—	—	—
Phenol		0.5	—	—	—
Copper		3	0.003	0.06	2/month
Zinc		5	0.01	0.06	2/month
Soluble Iron		10	0.06	0.18	2/month
Soluble Manganese		1	0.02	0.4	2/month
Total Chromium		2	<0.05	<0.05	2/month
Coliform bacteria count (number/m^3)		3,000	ND	ND	1/month
Nitrogen		—	15	18	1/month
Phosphorus		—	1.20	1.6	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value:lead/compound, hexavalent chromium, trichloroethylene, tetrachloroethylene, dichloromethane, 1,1,1-trichloroethane, boron/compound, ammonia and ammonium compounds, nitrite and nitric compounds (nitrogen).

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Control Ranking Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Copper sulfate	160,762	0	7.9	0	0	65,979	94,775	0
Potassium permanganate	8,336.0	0	2.4	0	0	8,333.6	0	0
Formaldehyde	7,938.8	0	205.6	0	2,509.4	0	5,219.0	4.8
Nickel	2,260.0	0	0	0	0	474.6	0	1,785.4
Toluene	330.3	166.1	0	0	164.2	0	0	0
Xylen	310.0	304.1	0	0	5.9	0	0	0
Ethylene glycol	146.4	0	24.9	0	121.5	0	0	0
Chlorodifuluoromethane	146.0	146.0	0	0	0	0	0	0
Hexafluoroethane, perfluoroethane	135.0	0	0	0	0	0	135.0	0
Poly (oxyethylene) nonyphe	121.5	0	0	0	121.5	0	0	0
Hydroquinone	90.6	0	2.4	0	88.2	0	0	0
Poly(oxyethylene) alkyl ether	76.0	0	0	0	20.0	0	56.0	0
1,1,1,2-tetrafluoroethane	49.2	49.2	0	0	0	0	0	0
Hydrogen fluoride	48.0	0	0	0	0	0	48.0	0
Argentic chloride	39.6	0	0	0	0	39.6	0	0
Caustic silver	34.9	0	0.35	0	0	32.8	0	1.75
Lead	33.7	0	0	0	29.2	0	0	4.5
Tetrafluoromethane, perfluoromethane	26.3	0	0	0	0	0	26.3	0
Others	113.6	0	0.1	0	44.1	30.6	36.2	2.6

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 There are no SOx emissions from facilities powered by city gas (13A).

Matsue Matsushita Electric Co., Ltd.

Major products: Film capacitors

Location: 369 Daisho, Nogifukutomi-cho, Matsue, Shimane, Japan

● Air (Conforming to the Air Pollution Control Law and other regulations and agreements)

Item	Facility	Regulation	Actual Measurement		
			Average	Maximum	Frequency of measurement
NO_x (ppm)	Boiler1	180	100	107	2/year
	Boiler2	250	87	88.9	2/year
	Boiler3	180	93	95.3	2/year
SO_x (Nm^3/h)	Boiler1	5.99	1.65	—	2/year
	Boiler2	5.12	0.84	—	2/year
	Boiler3	4.76	0.85	—	2/year
P.M. (g/Nm^3)	Boiler1	0.3	0.01	0.01	2/year
	Boiler2	0.3	0.01	0.01	2/year
	Boiler3	0.3	0.011	0.011	2/year

Measurements are from 3 major facilities.

● Total Emissions to the Air (Unit: tons/year)

Item	Total
SO_x	14.3
NO_x	2.6

● Total Emissions to Water (Unit: tons/year)

Item	Total
COD	1.1
Nitrogen	0.6
Phosphorus	0.07

Data does not include drainage into the sewage system.

● Odor

Violation of standards and its description
No violation

● Noise & Vibration

Violation of standards and its description
No violation

● Water (Conforming to the Water Pollution Law and other regulations and agreements) (Unit:mg/ℓ)

Item		Regulation *1	Actual Measurement		
			Average	Maximum	Frequency of measurement
pH (7 as neutral)		5.8-8.6	(7.4)	7.6-7.2	1/month
BOD		160(30)	—	—	—
COD		(29.1)	(13.2)	17.7	1/month
SS		200(150)	(8.0)	55	1/month
Extractive substance in n-hexane	Mineral Oil	5	(0.6)	2.3	1/month
	Animal and vegetable oil	30	(1.9)	4.9	1/month
Phenol		—	—	ND	1/year
Copper		—	—	0.08	1/year
Zinc		—	(0.8)	1.55	1/month
Soluble Iron		—	—	0.2	1/year
Soluble Manganese		—	—	ND	1/year
Total Chromium		—	—	ND	1/year
Coliform bacteria count (number/m^3)		(3,000)	(32)	94	1/month
Nitrogen		(19.4)	(7.5)	10.4	1/month
Phosphorus		(2.9)	(0.9)	1.8	1/month

Measurements are from major drainage pipes.

The following Health Category substances were below quantification limit and regulation value: cadmium/compound, cyanic compound, organic Phosphorus compound, lead/compound, hexavalent chromium, arsenic/compound, total mercury, alkyl mercury compound, PCB, trichloroethylene, tetrachloroethylene, dichloromethane, carbon tetrachloride, 1-2dichloroethane, 1,1-dichloroethylene, cis-1,2-dichloroethylene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,3-dichloropropene, thiuram, simazine, thiobencarb, benzene, selenium/compound, boron/compound, fluorine/compound.

Note:" /compound" stands for "and its compound"

● Chemical Substances (Matsushita Chemical Substances Control Ranking Guidelines: Version 2) (Unit: kg/year)

Substance	Total	Released		Transferred		Recycled	Eliminated	Consumed
		Air	Water	Sewage	Waste			
Octadecafluorooctane, perfluorooctane	9,720.0	9,720.0	0	0	0	0	0	0
Halogenous flame retardant	7,262.7	0	0	0	0	726.3	0	6,536.4
Toluene	2,297.7	2,297.7	0	0	0	0	0	0
Antimony trioxide	1,267.7	0	0	0	0	158.5	0	1,109.2
Lead solder	1,198.6	0	0	0	0	592.6	0	606.0
Barium sulphate	924.7	0	0	0	0	924.7	0	0
Sulphur hexafluoride	570.0	570.0	0	0	0	0	0	0
Xylene	4.0	4.0	0	0	0	0	0	0

"Recycled" includes paid recycling, as well as free and inverse onerous contract. "Eliminated" refers to the volume of substances that turned into other substances through neutralization, decomposition, or chemical reaction treatments. "Consumed" refers to the volume of substances, which are contained in or accompanied with products and transported outside the particular plant.

Note
Regulation: Standards set by laws and regulations
– : Not subject to regulation standards or no actual measurement
ND (not detectable): Values lower than the minimum quantifiable limit
Frequency of measurement is shown as: (number of times measured) / (time period)
*1 The values in ( ) indicate daily average.

Products Labeled with Environmental Characteristic Stickers

The following are environment-conscious products available in the Japanese market.

Products Launched in Fiscal 2001

Personal facsimile
KX-PW101CL

Alkali ion water purifier
PJ-A78

Infrared ray
family foot warmer
DK-S75AY6-H

Hi-Fi VCR
NV-HX11

Progressive
wide screen TV
TH-36FP30

BS digital hi-vision
TV with built-in
hard disk video recorder
TH-36DH200

Flat TV
TH-15FA5

Headphone stereo
RQ-SX97F

Portable MD player
SJ-MJ50

Product	
Model number	Feature
Personal facsimile	
KX-PW37CL,KX-PW47CL,KX-PW57CL	Reduced standby power consumption by 52% with energy-saving power device technology (3.6W→1.7W) *KX-PW55CL
KX-PW101CL,KX-PW102CW	Reduced standby power consumption by 23.5% with energy-saving power device technology (1.7W→1.3W) *KX-PW38CL
UF-A8WCL,UF-A8SCL	Reduced standby power consumption with energy-saving power device technology (→1.8W in main body)
Alkali ion water purifier	
PJ-A38	Reduced standby power consumption by 30% with energy-saving power device technology (→0.7W) *PJ-A36
PJ-A58	Reduced standby power consumption by 53% with energy-saving power device technology (→0.7W) *PJ-A36
PJ-A78	Reduced standby power consumption by 46% with energy-saving power device technology (→0.7W) *PJ-A76
PJ-A201	Reduced standby power consumption by 30% with energy-saving power device technology (→0.7W) *PJ-A36
Infrared ray family foot warmer	
DK-S60AW6-H,DK-S75AW6-H,DK-S75AW6-A, DK-S75AY6-H,DK-S75AY6-A,DK-S75AY6-C, DK-S76AY6-H,DK-S96AY6-H	Vinyl chloride resin and lead are used only in the power cord and not in the main body
TV door phone	
HA-S601K-TW,HA-S601K-TS	Reduced standby power consumption by 70% with energy-saving power device technology (→0.4W)*HA-S104
Hi-Fi VCR	
NV-HX11,NV-HXB55	Reduced standby power consumption by 63% with energy-saving power device technology (→1.3W; 0.7W when clock display is off)*NV-H220G
NV-HX33G	Reduced standby power consumption by 57% with energy-saving power device technology (→1.5W; 0.3W when clock display is off)*NV-H220G
S-VHS VCR	
NV-SVB300	Reduced standby power consumption by 80% with energy-saving power device technology (→1.3W; 0.3W when clock display is off)*NV-SB606
NV-SV100	Reduced standby power consumption by 76% with energy-saving power device technology (→1.3W; 0.3W when clock display is off)*NV-SX505
VTR-TV combo unit	
TH-21VFR30,TH-15VFR3,TH-21VFA30,TH-15VFA3	Uses lead-free solder in mounting the printed circuit boards to the main body
TV (4:3)	
TH-25FA5	Reduced remote controller standby power consumption by 32% with energy-saving power device technology (→0.17W) * Our conventional models
TH-25FB5	Reduced remote controller standby power consumption by 83% with energy-saving power device technology (→0.17W) * Our conventional models
TH-29FB5	Reduced remote controller standby power consumption by 57% with energy-saving power device technology (→0.17W) * Our conventional models
TH-21FA50	Reduced remote controller standby power consumption by 92% with energy-saving power device technology (→0.17W) * Our conventional models
TH-21FB50	Reduced remote controller standby power consumption by 88% with energy-saving power device technology (→0.17W) * Our conventional models
Progressive wide screen TV	
TH-28FP30,TH-32FP30,TH-36FP30,TH-28FP25, TH-32FP25,TH-36FP25,TH-32FS10,TH-32FY10, TH-28FS10,TH-28FY10	Uses lead-free solder in mounting the printed circuit boards to the main body
Progressive TV (4:3)	
TH-29FP5	Uses lead-free solder in mounting the printed circuit boards to the main body
BS digital built-in TV	
TH-24D25	Uses lead-free solder in mounting the printed circuit boards to the main body
Digital hi-vision TV	
TH-28D20,TH-32D20,TH-36D20	Uses lead-free solder in mounting the printed circuit boards to the main body
BS digital hi-vision TV with built-in hard disk video recorder	
TH-36DH200	Uses lead-free solder, halogen-free materials, etc.
Flat TV	
TH-15FR5,TH-21FR50,TH-15FA5	Reduced remote controller standby power consumption with energy-saving power device technology (→0.2W)
LCD TV	
TH-15TA2	Uses lead-free solder in mounting the printed circuit boards to the main body
DVD built-in LCD wide screen TV	
TH-11LV1,TH-15LV1	Uses lead-free solder in mounting the printed circuit boards to the main body
Personal mini component stereo	
SC-PM11	Reduced standby power consumption with energy-saving power device technology (→0.5W)
Headphone stereo	
RQ-SX97F,RQ-SX87,RQ-SX73,RQ-SX53	Uses lead-free solder in mounting the printed circuit boards to the main body
SD audio player	
SV-SD80	Uses lead-free solder in mounting the printed circuit boards to the main body
Portable MD player	
SJ-MJ78,SJ-MR220,SJ-MJ10,SJ-MJ90, SJ-MJ50,SJ-MJ50C	Uses lead-free solder in mounting the printed circuit boards to the main body
Portable CD player	
SL-CT790	Achieved 100-hour playback time (48% improved) with energy-saving power device technology *SL-SX500
SL-CT590	Achieved 95-hour playback time (45% improved) with energy-saving power device technology *SL-SX500

*Compared Model number

Environmental Characteristic Stickers


IC recorder
RR-US620


DVD recorder
DMR-E30


Digital video camera
NV-GS5K


Screw-in fluorescent lamp
EFA8EL


Inverter air-conditioner
kirei CS-E282A


Corner air-conditioner
CS-PV252A


Microwave oven
NE-SD10

Vacuum cleaner
MC-V280XD


IH rice cooker
SR-HG10B


Automatic washing / drying machine
NA-FD8001


Ion washing water maker
MS-W1

Product	
Model number	Feature
Mini cassette recorder	
RQ-L26,RQ-L11	Uses lead-free solder in mounting the printed circuit boards to the main body
IC recorder	
RR-QR400,RR-US620,RR-US520	Uses lead-free solder in mounting the printed circuit boards to the main body
Portable commuting time radio	
RF-NS460R,RF-NT850R,R-NT750R	Uses lead-free solder in mounting the printed circuit boards to the main body
DVD recorder	
DMR-E30	Reduced standby power consumption by 50% with energy-saving power device technology (→3.0W; 0.9W when clock display is off) *DMR-E10
Digital video camera	
NV-MX2500,NV-EX21,NV-MX1000, NV-DS88K,NV-MX3000	Uses lead-free solder in mounting some of the printed circuit boards to the main body
NV-GS5K	Uses lead-free solder in mounting the printed circuit boards to the main body
SD multiple camera	
SV-AV10	Uses lead-free solder in mounting the printed circuit boards to the main body
SD mobile printer	
SV-P10	Uses lead-free solder in mounting the printed circuit boards to the main body
Screw-in fluorescent lamp	
EFA8EL,EFA8EN,EFA8ED,EFG8EL	The brightness equivalent to our 40W incandescent lamps with 8W power consumption
EFA13EL,EFA13EN,EFA13ED,EFD13UEL, EFD13UEN,EFG13EL,EFG13EN,EFG13ED, EFG13EDG,EFG13EDC,EFD13UED	The brightness equivalent to our 60W incandescent lamps with 13W power consumption
EFA22EL,EFA22EN,EFA22ED,EFD22EL, EFD22EN,EFD22ED,EFG22EL,EFG22EN, EFG22ED,EFG22EDG	The brightness equivalent to our 100W incandescent lamps with 22W power consumption
Screw-in fluorescent lamp (Drimmer control models)	
EFA22EL/C	The brightness equivalent to our 100W incandescent lamps with 22W power consumption
Inverter air-conditioner	
kirei(CS-E222A,CS-E252A,CS-E252A2, CS-E282A,CS-E282A2,CS-E402A,CS-E402A2)	Conforming to FY 2004 targets of the Energy Conservation Law with the installation of high-efficiency scroll compressor; labeling of resin material parts; banning of styrene foam packaging
CS-E402BH,CS-E402BH2,CS-E502BH2	Conforming to FY 2004 targets of the Energy Conservation Law with the installation of high-efficiency scroll compressor; labeling of resin material parts; banning of styrene foam packaging
CS-V222A,CS-V252A,CS-V252A2,CS-V282A, CS-V362A,CS-V362A2,CS-V402A2,CS-V282A2	Conforming to FY 2004 targets of the Energy Conservation Law with the installation of high-efficiency scroll compressor; labeling of resin material parts
Corner air-conditioner	
CS-PV252A,CS-PV282A,CS-PV282A2, CS-PV362A2,CS-PV402A2,CS-P361A2, CS-P401A2	Conforming to FY 2004 targets of the Energy Conservation Law with the installation of high-efficiency scroll compressor; labeling of resin material parts
Microwave oven	
NE-JS25,NE-SD10	Reduced power consumption by 44% with high-efficiency microwave supplying technology using new-type inverter and with new heating system (→239kWh/Year) *NE-N20
NE-JW20	Reduced power consumption by 45% with high-efficiency microwave supplying technology using new-type inverter and with new heating system (→236kWh/Year) *NE-N20
NE-NS30	Reduced power consumption by 42% with high-efficiency microwave supplying technology using new-type inverter and with new heating system (→251kWh/Year) *NE-N20
Vacuum cleaner	
MC-S84XD,MC-S86XD	Reduced power consumption by approx. 53% during automatic operation with dust sign control *Our 1000W-model without dust control sign
MC-V280XD,MC-V180XD	Reduced the mass of the main body by 31% using exhaust circulation system *MC-S260XD
Cordless vacuum cleaner	
MC-BX11,MC-BX6	Quadrupled the amount of usable charged electricity with high-efficiency battery chargers and inverter motors *MC-B43M
IH rice cooker	
SR-F10B,SR-F18B,SR-HG10B,SR-HG18B, SR-E10B,SR-E18B,SR-D10B,SR-D18B	Reduced power consumption by approx. 30% during heat insulation with all IH and heat insulation control technology (Reduction of 4.1kWh/month in 1.8L types and 3.2kWh/month in 1.0L types.) *SR-IHYC
Electric pot	
NC-JD40,NC-JD30	Reduced power consumption by 47% during heat insulating with vacuum insulating technology
Electric bidet with shower	
DL-ST30,DL-ST20,DL-ST10	Reduced power consumption by 18% using the automatic energy-saving system (Reduction of apprx. 50%kWh/year) *DL-3G
Automatic washing machine	
NA-F80SP1	Reduced power consumption by approx. 62% with new DMM inverter and special cleaner *NA-F80AP2P
NA-F70SP1	Reduced power consumption by approx. 59% with new DMM inverter and special cleaner *NA-F70AP
NA-F60SP1,NA-F60RP1	Reduced power consumption by approx. 60% with new DMM inverter and special cleaner *NA-F60BP
NA-F50P1	Reduced power consumption by approx. 69% with new DMM inverter and special cleaner *NA-F50E
Automatic washing/drying machine	
NA-FD8001	Reduced power consumption by approx. 59% with new DMM inverter and special cleaner *NA-F80AP2
NA-FD6001	Reduced power consumption by approx. 49% with new DMM inverter and special cleaner *NA-F60BP
Gas cooker	
GT-WS2R,GT-WS2L,GE-WS20,GE-WS21, GE-WG750	Reduced power consumption in stoves by 30% with new high-efficiency burners *GT-BT3
Air purifier	
MS-R2500	Reduced power consumption by 38% with high-efficiency inverter motors *MS-R750 rated speed of 15.6Wmin/m^3
Ion washing water maker	
MS-W1	Contributes to the reduction of environmental impact by making washing water from tap water and salt.

*Compared Model number

External Awards

Our environmental efforts and environment-conscious products have been recognized by organizations throughout the world.

Category	Name of Award	Subject	Date	Presenter
Environmental Management	Grand Prize, Global Environment Award	Matsushita Electric Group (P.72)	Apr. 2002	Fujisankei Communications Group Japan Industrial Journal
	Nikkei Superior Trend-setting Factories and Offices Award	Matsushita Eco Technology Center Co., Ltd.	Dec. 2001	Nihon Keizai Shinbun Japan
	Business and Industry Award for Exemplary Environmental Program	Panasonic Customer Call Center Company, Matsushita Electric Corporation of America	Mar. 2002	Environmental Improvement Council, Chesapeake, U.S.A
	The MARS Golden Oak Award Golden Oak Certificate of Excellence	Matsushita Communication Industrial U.K. Ltd.	Oct. 2001	Berkshire U.K.
	Hebei Significant Contributors of Environmental Protection Award	Liu Baocheng, Chairman and Vise President of Tangshan Matsushita Industrial Equipment Co., Ltd.	Mar. 2002	Environment Protection Agency, Education Committee, Hebei, China
	Top 10 Environment-Conscious Executive Managers in Shenyang	Hirose Kozo, President of Shenyang Matsushita Storage Battery Co., Ltd. (P.26)	June 2001	Environment Protection Agency Shenyang, China
	Environmental Protection Business Leader Award	China Hualu Matsushita AVC Co., Ltd.	June 2001	Environment Protection Agency Dalian, China
	"Green Company" Award in Wuxi	Wuxi Matsushita Refrigeration Co., Ltd. Wuxi Matsushita Refrigeration Compressor Co., Ltd.	Nov. 2001	Environment Protection Agency Wuxi, China
	Leading Facility Award "Model City of the National Environment-Conscious Construction"	Qingdao Matsushita Electronic Components Co., Ltd. (Bonded area) (P.72)	June 2001	Economic & Technical Development Zone Management Committee, Qingdao, China
Prevention of Global Warming	Energy Star Partner of the Year Award	Matsushita Electric Industrial Co., Ltd., (MEI) Matsushita Electric Corporation of America	Mar. 2002	Department of Energy, Environment Protection Agency, U.S.A
	Minister of Economy, Trade and Industry Prize, Energy Conservation Award	Triple Cooling System Refrigerators NR-D47H2,NR-D44H2, NR-D42H2	Jan. 2002	Energy Conservation Center Japan
		Three-Terminal Intelligent Power Device (IPD) for Conserving Energy During Standby Operation (P.30)		
	Energy Resource Bureau's Director Prize, Factory Energy Management Excellence Award	Tsuyama Plant, AVC Media Business Unit, AVC Company, MEI, Hokkaido Matsushita Electric Co., Ltd.	Jan. to Feb. 2002	
	Ministry of Economy, Trade and Industry's Director Prize, Factory Energy Management Excellence Award	Fukushima Plant, AVC Network Business Group, AVC Company, MEI Kusatsu Site, Air-Conditioner Company, MEI Uozu Plant, Semiconductor Company, MEI Toyonaka Site, Matsushita Industrial Equipment Co., Ltd. Factory Automation Division, Kyushu Matsushita Electric Co., Ltd. Suzaki Plant, Matsushita Kotobuki Electronics Industries, Ltd. Headquarter Plant, Matsue Matsushita Electric Co., Ltd. Nagatano Plant, West Electronic Co., Ltd.		
	Agency of Natural Resources and Energy's Director-General Prize, Energy Conservation Best Practice Award	Corporate Environmental Affairs Division, Matsushita Refrigeration Company Wakimachi Plant, Matsushita Kotobuki Electronics Industries, Ltd.		
	Ministry of Economy, Trade and Industry's Director Prize, Energy Conservation Best Practice Award	Tonami Plant, Semiconductor Company, MEI		
	Energy Conservation Center's Chairman Prize, Energy Conservation Best Practice Award	Kitchen Appliance Division, Home Appliance & Housing Electronics Company, MEI Kasugai East Plant, Matsushita Seiko Co., Ltd. Takefu Matsushita Electric Co., Ltd.		
Protection of the Environment	Award for Excellent Efforts in Preservation of Air Quality	Nagaoka Plant, Semiconductor Company, MEI (P.25)	Dec. 2001	Ministry of the Environment Japan
	Sustainable Product Recognition	Mercury-free and low-mercury products	Jan. 2002	Environment Protection Agency New Jersey, U.S.A
	Technology Development Paper Award of the Symposium on Microjoining and Assembly Technology in Electronics	"Development of High Speed Local Reflow Soldering Process for Lead-free Solder with Diode-laser" MEI	Feb. 2002	Welding Society Japan
	Electric Science Technology Promotion Award (OHM Technology Award)	"Development of Ecology-Oriented Resin Mold Transformer" MEI	Nov. 2001	The Promotion Foundation for Electrical Science and Engineering, Japan
	Grand Prize, Nikkei BP Technology Award	"Development of Explosion Prevention Technology to Achieve CFC-free Refrigerator" Matsushita Refrigeration Company (P.31)	Mar. 2002	Nihon Keizai Shimbun Japan
Conservation of Resources and Recycling	Chairman's Award of Recycling Promotion Conference	Kadoma Site/Okayama Site, AVC Company; Utunomiya Visual Plant, Television System Products Division; Yamagata Plant, AVC Devise Business Unit; MEI Nagaoka Site/Arai Plant/Tonami Plant, Semiconductor Company, MEI Okayama Site, Semiconductor Company/Lighting Company, MEI Utunomiya Site, Lighting Company/Display Devices Company, MEI Nagasaki Plant, Headquarters/Saga Division/Telecom Division, Kyushu Matsushita Electric Co., Ltd.	Oct. 2001	Recycling Promotion Conference Clean Japan Center

Category	Name of Award	Subject	Date	Presenter
Conservation of Resources and Recycling	Chairman's Award of Recycling Promotion Conference	Saijyo Site/Ipponmatsu Site, Matsushita Kotobuki Electronics Industries, Ltd., Kasugai East Division, Matsushita Seiko Co., Ltd. Takefu Matsushita Electric Co., Ltd., Tajima Matsushita Electric Co., Ltd., Miyazaki Matsushita Electric Co., Ltd. Nagatano Plant, West Electronic Co., Ltd.	Oct. 2001	Recycling Promotion Conference Clean Japan Center
	WorldStar Award	"Air Mold QOOPAQ" AVC Network Business Group, AVC Company, MEI	Nov. 2001	World Packaging Organization
	AsiaStar Award			Asian Packaging Federation
	Director General Award, Manufacturing Industries Bureau, Ministry of Economy, Trade and Industry Japan Star Award			Japan Packaging Institute
	President Prize of Japan Productivity Center for Socio-Economic Development Japan Star Award	"Flower-Open Case" Television System Products Division, AVC Company, MEI	Nov. 2001	
	Electric Equipment Packaging Category Prize Good Packaging Award	"Environment-Conscious Packaging for Communications Equipment" Matsushita Communication Engineering Co., Ltd., Matsushita Communication Industrial Co., Ltd.	Nov. 2001	
	Packaging Technology Prize Kinoshita Award	“Creation of New Value: Development of ‘See'n Separate Pack’ for Dry Cell Batteries and Introduction in the Market” Matsushita Battery Industrial Co., Ltd.	May 2001	
	Liaoning Company Efforts for Water Conservation Award	Shenyang Matsushita Storage Battery Co., Ltd.	Apr. 2001	Committee of Economy and Trade, Liaoning Construction Agency, China
	Liaoning Individual Efforts for Water Conservation Award	Zhang Jiming, Vice president of Shenyang Matsushita Storage Battery Co., Ltd		
Environmental Communication	Excellence Prize Green Reporting Award	Matsushita Electric Group Environmental Sustainability Report 2001	May 2002	Toyo Keizai, Inc. Japan
	40th Anniversary Special Award Industrial Advertisement Grand Prix	Environmental technology advertisement series of MEI	Dec. 2001	The Japan Industrial Journal
	Television Category Trophy Winners Combination (TIE) International Broadcasting Awards (IBA)	Environmental TV commercial series of MEI	Jan. 2002	Hollywood Radio and Television Society
	Award for Continued Excellence ECO-Web Awards	Environmental Website of MEI	Mar. 2002	Ecology Symphony Japan

Grand Prize in the 11th Global Environment Award

In the presentation of the 11th Global Environment Award (presented by Japan Industrial Journal and Fujisankei Communications Group), which recognizes companies who actively work to protect the environment with the aim of encouraging the development of the industry and co-existence with the global environment, Matsushita received the Grand Prize for the group-wide environmental initiatives in setting the Environmental Vision and in holding the Environmental Forum.
Matsushita has also received the 1st Fujisankei Communications Group Award, the 9th International Trade and Industry Minister's Award, and the 10th Federation of Economic Organizations Chairman's Award in past Global Environment Awards.

President Nakamura delivers a speech at the award ceremony.

Energy Star Partner of the Year Award for Four Consecutive Years

In March 2002, Matsushita Electric Industrial Co., Ltd. and Matsushita Electric Corporation of America (MECA) won the trophy for the 2002 Energy Star Partner of the Year presented by U.S. Environmental Protection Agency for the fourth consecutive year. The award was given for our achievement in selling energy-saving products that lead the industry, such as audio-visual products (TVs, video recorders, and TV-recorder combo units) meeting 100% of Energy Star standards in all 15 categories and for actively promoting the Energy Star program in the market.


U.S. Environmental Protection Agency Administrator Whitman presents the trophy to Bearden, president of Panasonic Consumer Electronics Company (right), and Thompson, General Manager of MECA (left).

Environmental Milestones

Era	Activities of Matsushita Electric Group	Milestones of the world	Milestone of Japan
			1967 Basic Law for Environmental Pollution Control enacted
			1968 Air Pollution Control Law enacted
			1968 Noise Regulation Law enacted
1970s	1970 Nov Pollution Survey Committee established		1970 Water Pollution Control Law enacted
			1970 Waste Disposal and Public Cleansing Law enacted
			1971 Environment Agency established
	1972 Dec Environmental Management Office established	1972 Club of Rome publish The Limits to Growth	1972 The first White Paper on the Environment published
		1972 U.N. Conference on Human Environment held in Stockholm (Declaration of Human Environment adopted)	
		1972 United Nations Environmental Program (UNEP) established	
	1973 Aug Appointed Pollution Prevention Administrator and Pollution Prevention Manager in each division		
	1975 Jan Environmental Management Regulations enacted		
			1976 Vibration Regulation Law enacted
			1979 Law Concerning the Rational Use of Energy (Energy Conservation Law) enacted
1980s		1985 Vienna Convention for the Protection of the Ozone Layer adopted	
		1987 Montreal Protocol on Substances That Deplete the Ozone Layer adopted	
	1988 Feb CFC-reduction Committee established		
	1989 Oct Environmental Protection Promotion Office established	1989 Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal enacted	
1990s	1991 Jun Matsushita Environmental Charter ("Environmental Statement" and "Code of Conduct") enacted		1991 Law for Promotion of Effective Utilization of Resources enacted
	1991 Oct Matsushita Product Assessment adopted		1991 "Keidanren Global Environment Charter" enacted by Japan Federation of Economic Organizations
	1992 Oct Environmental Policy Committee established	1992 United Nations Framework Convention on Climate Change adopted	
		1992 The Earth Summit held in Rio de Janeiro, Brazil; Agenda21 and Rio Declaration on Environment and Development adopted	
	1993 Mar Matsushita Environmental Voluntary Plan adopted		1993 The Basic Environment Law enacted (Basic Law for Environmental Pollution Control abolished)
	1993 Oct Won Stratospheric Ozone Protection Award presented by U.S. Environmental Protection Agency		
		1995 First Conference of Parties to the U.N. Framework Convention on Climate Change (COP1) held in Berlin	1995 Containers and Packaging Recycling Law enacted
		1996 ISO 14001 International Standard on Environmental Management Systems launched	1996 "Keidanren Appeal on the Environment" announced by Japan Federation of Economic Organization
		1996 COP2 held in Geneva	
	1997 Oct Corporate Environmental Affairs Division (CEAD) established	1997 Koyoto Protocol adopted in COP3 held in Kyoto	1997 "Keidanren Voluntary Action Plan on the Environment" announced by Japan Federation of Economic Organization
	1997 Oct Environmental Conference established (Held semi-annually)		
	1998 Feb Love the Earth Citizens' Campaign commenced	1998 COP4 held in Buenos Aires	1998 Home Appliance Recycling Law enacted
	1998 Feb Matsushita's first Environmental Report published		1998 Law Concerning the Promotion of the Measures to Cope with Global Warming enacted
	1998 Jul Recycling Business Promotion Office established		1998 Law Concerning the Rational Use of Energy (Energy Conservation Law) revised
	1999 Mar Acquired ISO14001 Certification in all manufacturing sites	1999 COP5 held in Bonn	1999 Law Concerning Special Measures against Dioxins enacted
	1999 Mar Green Procurement launched		1999 PRTR (Pollutant Release and Transfer Register) Law enacted
	1999 Nov Won Grand Prize in the Environmental Reporting Award presented by the Global Environmental Forum		
2000s	2000 Jun Lead-free Solder Project commenced	2000 Global Reporting Initiative (GRI) issue The Sustainability Reporting Guidelines	2000 Develping an Environmental Accounting System (Year 2000 Report) issued
	2000 Nov Won Grand Prize in the Environmental Reporting Award	2000 COP6 held in Hague	2000 Basic Law for Establishing the Recycling-based Society enacted
			2000 Law for Promotion of Effective Utilization of Resources revised
	2001 Apr Matsushita Eco Technology Center launched	2001 Reached final agreement on the actual rules of Kyoto Protocol in COP7 held in Marrakesh	2000 Law on Promoting Green Purchasing enacted
	2001 Oct Environmental Vision and Green Plan 2010 adopted		2001 Ministry of the Environment established through reorganization of central government
	2001 Oct Held Environmental Forum in Tokyo		2001 Environmental Reporting Guidelines (Fiscal Year 2000 Version) issued
	2001 Dec Held Environmental Forum in Freiburg (Germany)		2001 Environmental Performance Indicators for Businesses (Fiscal Year 2000 Version) issued
			2001 Law Concerning Special Measures against PCBs enacted
			2001 Law for Promotion of Effective Utilization of Resources administered
	2002 Feb Won the Energy Conservation Award presented by the Energy Conservation Promotion Council for the following products: · Triple Cooling System Refrigerator Series · Power devices for Switching Power Supply		2001 Home Appliance Racycling Law administered
			2001 Law on Promoting Green Purchasing administered
	2002 Apr Won Grand Prize in the Eleventh Global Environmental Awards presented by The Japan Industrial Journal		
		2002 Johannesburg Summit	

Sustainability Analysis by The Natural Step

With the purpose of verifying the validity and improving the quality of our environmental policy and activities, as well as specific products from the perspective of sustainability, Sustainability Analysis and Third Party Comments were entrusted to The Natural Step, a Swedish non-profit environmental organization dedicated to advocating the basic principles for a sustainable society and business.

Outline of Analysis

In July 2001, a sustainability analysis of our environmental policy and overall environmental activities was conducted and reported on in the Environmental Sustainability Report 2001. To delve further into the results of the analysis and integrate them into business activities, a sustainability analysis of product strategy was carried out, taking representative products of our company, TVs and refrigerators, as examples.

We intend to not only improve the environmental performance of our products, but also to further emphasize the sustainability aspect and apply it to product planning and manufacturing.

Outline of Product Sustainability Analysis

Purpose:
To examine our product strategy by learning the conditions required of products from the perspective of sustainability.

Analyst:
Dr. Karl-Henrik Robert
Chairman and founder of The Natural Step
Professor of Resource Theory at the University of Gothenburg, Sweden

Coordinator:
Sachiko Takami
Chairperson, The Natural Step Japan

Translator:
Kazumasa Miyata
Facilitator, The Natural Step Japan

Information provided:
Matsushita's answers to the sustainability template presented by The Natural Step

Period of Analysis:
February 1, 2002 – April 3, 2002

URL **Environmental Sustainability Report 2001 (Third Party Comments on the Report)**
http://www.matsushita.co.jp/environment/2001e/er01e_63.pdf

Process Leading to the Product Sustainability Analysis

June 2000
Studied The Four System Conditions for a Sustainable Society advocated by The Natural Step.

June 2001
Implemented a scenario planning workshop for illustrating "a sustainable society in 2025" based on The Natural Step's backcasting approach.

July 2001
Requested a sustainability analysis employing The Natural Step methodology and conducted a benchmarking study against environmentally progressive companies in Europe.
(Matsushita staff visited The Natural Step headquarters in Sweden and received the sustainability analysis of Matsushita's environmental policy and overall environmental activities. The results were reported in the Environmental Sustainability Report 2001.)

October 2001
An analyst from The Natural Step headquarters in Sweden visited Japan and attended the Environmental Forum 2001 organized by Matsushita.
A follow-up meeting was held to report on the analysis.

January 2002
Agreed on conducting a sustainability analysis of products on a trial basis.

February-March 2002
Received and replied to a list of questions (sustainability template) from The Natural Step.

April 2002
Results of The Natural Step sustainability analysis reported to Matsushita's environmental executives.

Reporting the results: April 3, 2002

the NATURAL STEP

The Natural Step is an international non-profit environmental organization founded in 1989 by Dr. Karl-Henrik Robert, a leading Swedish pediatric oncologist. Currently, its activities are based in nine nations – Sweden, its country of origin, Australia, United Kingdom, Canada, New Zealand, United States, South Africa, Israel, and Japan. Based on the consensus of numerous scientists, The Natural Step in Sweden defined a set of conditions which establish the framework for a sustainable society, advocating them as The Four System Conditions. As these conditions are non-overlapping and covers the whole area of sustainability, they are adopted in the sustainability strategies of many environmentally progressive countries and corporations. The overall aim of The Natural Step is to spread this new concept throughout the global society, declaring that by satisfying the conditions for a sustainable society and by practicing business in line with those conditions, businesses can thereby increase competitiveness.

The Four System Conditions

In a sustainable society, nature is not subject to systematically increasing:
1) concentrations of substances extracted from the earth's crust;
2) concentrations of substances produced by society;
3) degradation by physical means through overharvesting, introductions and other forms of modification;
and, in that society
4) human needs are met in our society and worldwide.

Conditions for a Sustainable Society

1 Extraction from the earth's crust
2 Chemical substances
3 Degradation by physical means
4 Human needs

April 3, 2002

Sukeichi Miki
CTO, Senior Managing Director, Member of the Board
Matsushita Electric Industrial Co., Ltd.

the NATURAL STEP

Sustainability Analysis Report of Matsushita Products

[Outline] Matsushita's lines of TVs and refrigerators were analyzed from a sustainability perspective, utilizing the The Natural Step framework. TNS presented a sustainability template containing questions to Matsushita, and based on Matsushita's answers to these questions, TNS analyzed the current situation, visions and plans for the future, and the early steps taken toward that future, focusing on the following three aspects: global market situation, principle product, and marketing and societal outreach.

[Analysis]

I. Global Market Situation

·It is an opportunity to further advance the awareness of TVs as an asset in efforts to dematerialize the global society at large. With this awareness, Matsushita have a potential to develop active plans to, for example, offer products or services in ways that are not confined to sell TV sets conventionally, but go beyond merely selling them, transcending conventional marketing practices. It is important that these products are regarded not only as sustainability problems that need to be tackled, but also as presenting great prospects for achieving a sustainable society.

·It is essential to enhance awareness that consideration should be given to the developing countries, regarding TV's as an asset for achieving sustainable development, also taking into account the need to curb rebound effects from IT. and to develop active plans for its sustainability. The IT market must be expanded in the future This awareness may not lead to any immediate actions, but should be used to develop active plans, and be made an explicit part of Matsushita's long-term executive plans.

II. Principle Product

i) Dematerialization

·Matsushita has reached global top-level technologies when it comes to pursuing lean production, compact and light materials, energy efficient end products, and "pre-recycling" i.e. preparing TVs for recycling as early as the production level.

·As for refrigerators, Matsushita has made remarkable and valuable progress in energy efficiency, 81% less energy use than that of products made in 1995.

·From the sustainability viewpoint, it is necessary to achieve a much higher recycling rate of TVs than is presently occurring. To improve recycling rates, it is also necessary to eliminate impurities from materials used in TVs. These concerns also apply to refrigerators as well, with emphasis on the need to recycle all refrigerators.

ii)Substitution

·That Matsushita is considering magnesium as a prospective material makes future development highly interesting. As magnesium is abundant in natural systems, it is thought that increased concentration is unlikely to occur. (Since the phasing out of many inherently unsustainable materials will require substitutes, it is good that new methods and materials are introduced as assets for sustainable development.) In addition, to take greater advantage of the potential of magnesium, it is extremely important to conduct critical investigation of the current activities in relation to this metal, from energy used for mining and processing to recycling, from the standpoint of sustainability.

·Selection of chemicals must be undertaken with more strict discrimination. As lists of hazardous compounds are based on their known effects only, the phasing out of these chemicals will not be sufficient in the long run. The new refrigerant Isobutane (HC-600a) used in refrigerators is an example of strategically sound substitution. However, it is important not to evaluate these chemical substances by the present environmental load alone, e.g. their effect on global warming. From the standpoint of sustainability, all compounds that are persistent in and foreign to nature need to be phased out, and to that end a more rigorous analysis of chemicals needs to be done.

·As for the supply chain, guidelines are necessary for sustainable use of forest resources, strip-mining processes, and restoration of natural systems after resource extraction. It is also important to define and declare Matsushita's long-term vision that complies with The System Conditions of a sustainable society.

·From a human point of view, Matsushita's plans are very promising. For example, it has enacted specific measures to increase energy efficiency and reduce CO_2 emissions, and made long-term plans for recycling of materials, which is important from a global human perspective. It is the poor countries of the world that seem particularly at risk from a human global perspective, and scarce metals and their prices may become constraints to those countries. However, no comments are provided by Matsushita regarding the social costs of extracting raw materials from developing countries, and the future design of social infrastructure and products that fit the needs of the developing countries.

III. Marketing and Societal Outreach

A very good example of outreach from Matsushita is the repair service it offers. While a highly positive effort, it is still a poorly exploited means of dematerialization. However, as the future picture is very clear, actions must be taken to change the overall systems in society and promote the use of such services.

Another example of outreach is displaying power consumption figures on the refrigerator doors and introducing energy-saving tips in product catalogs. Though Matsushita is already greatly contributing in such ways, as a company heading in the sustainable direction, it must further expand societal outreach as one of its main strategies.

To enable evolution into a sustainable society, it is necessary to promote wider communication and actively influence the society at large. The key to this is forming partnerships with other businesses, universities, and governmental institutions, as well as approaching customers. It is critical to link sustainability activities to societal outreach, and at the same time, for the top management level to be aware of sustainability in their business activities.

Karl-Henrik Robèrt

Comments from TNS Chairman Karl-Henrik Robèrt

"Through the two analyses of overall business activities and specific products, we have come to understand that Matsushita is progressing in the direction of sustainability. With a greater vision, we hope Matsushita will serve as a model for not only Japan, but for Asia and the world as well. We look forward to Matsushita's continued challenges toward sustainability."

This report is prepared from excerpts taken from the Sustainability Report of Matsushita Products.

In Response to the Third Party Comments

FY 2001 marked an epoch in the history of Matsushita. Looking at the decade ahead, we established the Environmental Vision and its action plan, Green Plan 2010, and the direction to be taken by the company was made known to society through the Environmental Forum, which served as a venue for the active exchange of views.

This year, we focused on product development based on our action plan and had it analyzed in great detail according to the explicit concepts of The Natural Step. While we consider the targets of Green Plan 2010 to be high hurdles, the high evaluation of their direction has been strongly encouraging. With renewed determination, we intend to concentrate on attaining those targets. Also of great interest to us are their suggestions for efforts to be undertaken by Matsushita as seen from the perspective of sustainability.

With Sachiko Takami, The Natural Step Japan

This is because we believe the keyword for realizing our Environmental Vision and Green Plan 2010 is "sustainability." It is a new concept of realizing both environmental conservation and business development. Until now, we have promoted the development of Green Products (GP) in pursuit of environmental efficiency. As the next step, under the concept of Super GP, we are aiming to create products in pursuit of sustainability. The natural fluid (HC) refrigerators marketed in FY 2001 and household fuel cell cogeneration systems currently under development are equipped with new environmental technology. By generating an added value of environmental performance, these products contribute to expanding the market, as well as to realizing a sustainable society. Incorporating the results of this analysis, I believe we can deepen discussions on Super GP and sustainability within the company.

Furthermore, we learned that with products made in pursuit of sustainability, it is extremely important to make active approaches to the market. Partnership with governmental organizations and other businesses, and activities to raise customers' awareness, can serve as a great power for spreading such products to the society. By augmenting the "market-in" concept of offering values requested by customers with the "society-in" concept of responding to society's needs and contributing to its development, we hope to promote further evolution of our company.

Sukeichi Miki

CTO, Senior Managing Director, Member of the Board
in Charge of Technology, Quality, and Environment
Matsushita Electric Industrial Co., Ltd.

Panasonic Center

(Scheduled to open in September 2002)

The Panasonic Center is a comprehensive information base for global transmission of the corporate image pursued by Matsushita, and for marketing through real communication with customers. It features displays of life in the near future, a broadband studio equipped with the latest digital recording system, and a museum (fee required) where one can learn about the future of humankind and the global environment through scientific exhibits of dinosaur fossils. Under the theme of coexistence with the environment, various ideas for prevention of global warming are demonstrated, from advanced technology such as a household fuel cell cogeneration system to Green Products for daily use. The Center is also equipped with Matsushita's own environmental developments, such as an energy management system and a solar power generation system, realizing energy savings of 30% compared with buildings of equivalent scale. Eco tours of these systems are available. We await your visit to the Panasonic Center.

Information

Hours: 11:00-18:00 (closed on Mondays)
Access:
- Tokyo-Shinbashi-Ariake
  (JR Yamanote Line →Yurikamome)
- Osaki-Kokusai Tenjijo (Rinkai Line*)

* To be extended to JR Yamanote Line Osaki Station in December 2002.

For inquiries:
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2-5-18 Ariake, Koto-ku, Tokyo
Phone +81-3-3599-2500

Afterwards

In this report, we aimed to convey in as much detail as possible the lively activities and transformation occurred in FY 2001, which served as a big step forward for Matsushita, as well as the comparatively tedious efforts behind the scenes. There is no place for business activity that ignores the problems of our society, as solving those problems gives meaning to our existence. We look forward to receiving your frank comments through this report.

Published by Minoru Ueda, Director,
Corporate Environmental Affairs Division

Please send comments and inquiries regarding this report to:
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Issued in September 2002

Produced with the cooperation of Cre-en Co., Ltd.

This mysterious deep blue is called Tsugaru lacquer. The blue color is rarely seen in Japanese lacquer ware. What made this color possible was the innovative modern technology of lacquer masters. Lacquer ware is made with several layers of lacquer resin coating painted on wood such as Hiba cypress, Japanese white bark magnolia, or katsura tree. Lacquers have been made since the Jomon Period, a few thousand years ago. They epitomize a highly sophisticated manufacturing culture combining the blessings of rich forest resources that supply the wood and instruments and an exquisite tradition of craftsmanship.

This report uses 100% recycled paper, with an 85% whiteness for the main text and 70% for the Facts & Figures section. Vegetable soy ink is used to conserve oil resources and reduce air-polluting VOCs (volatile organic compounds). The printing was carried out in an ISO 14001-certified plant.

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